
Logtalk APIs

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CONTENTS

1	Libraries	1
1.1	arbitrary	1
1.1.1	arbitrary	1
1.2	assertions	7
1.2.1	assertions	8
1.2.2	assertions(Mode)	9
1.2.3	assertions_messages	11
1.3	assignvars	12
1.3.1	assignvars	12
1.3.2	assignvarsp	13
1.4	base64	17
1.4.1	base64	17
1.4.2	base64url	19
1.5	cbor	21
1.5.1	cbor	21
1.5.2	cbor(StringRepresentation)	22
1.6	code_metrics	24
1.6.1	cc_metric	24
1.6.2	code_metric	26
1.6.3	code_metrics	38
1.6.4	code_metrics_messages	40
1.6.5	code_metrics_utilities	41
1.6.6	coupling_metric	46
1.6.7	dit_metric	48
1.6.8	doc_metric	49
1.6.9	halstead_metric	53
1.6.10	halstead_metric(Stroud)	55
1.6.11	noc_metric	56
1.6.12	nor_metric	58
1.6.13	size_metric	59
1.6.14	upn_metric	61
1.7	core	62
1.7.1	core_messages	62
1.7.2	expanding	63
1.7.3	forwarding	65
1.7.4	logtalk	67
1.7.5	monitoring	81
1.7.6	user	83
1.8	coroutining	84
1.8.1	coroutining	84

1.9	csv	87
1.9.1	csv	88
1.9.2	csv(Header,Separator,IgnoreQuotes)	89
1.9.3	csv_guess_questions	90
1.9.4	csv_protocol	92
1.10	dates	102
1.10.1	date	102
1.10.2	datep	103
1.10.3	time	107
1.10.4	timep	108
1.11	dead_code_scanner	110
1.11.1	dead_code_scanner	110
1.11.2	dead_code_scanner_messages	118
1.12	debug_messages	119
1.12.1	debug_messages	119
1.13	debugger	123
1.13.1	debugger	123
1.13.2	debugger_messages	132
1.13.3	debuggerp	133
1.13.4	dump_trace	144
1.14	dependents	145
1.14.1	observer	146
1.14.2	subject	147
1.15	diagrams	150
1.15.1	d2_graph_language	151
1.15.2	diagram(Format)	152
1.15.3	diagrams	175
1.15.4	diagrams(Format)	176
1.15.5	directory_dependency_diagram	187
1.15.6	directory_dependency_diagram(Format)	188
1.15.7	directory_diagram(Format)	190
1.15.8	directory_load_diagram	193
1.15.9	directory_load_diagram(Format)	195
1.15.10	dot_graph_language	196
1.15.11	entity_diagram	198
1.15.12	entity_diagram(Format)	199
1.15.13	file_dependency_diagram	203
1.15.14	file_dependency_diagram(Format)	204
1.15.15	file_diagram(Format)	206
1.15.16	file_load_diagram	209
1.15.17	file_load_diagram(Format)	211
1.15.18	graph_language_protocol	212
1.15.19	graph_language_registry	216
1.15.20	inheritance_diagram	217
1.15.21	inheritance_diagram(Format)	219
1.15.22	library_dependency_diagram	220
1.15.23	library_dependency_diagram(Format)	221
1.15.24	library_diagram(Format)	223
1.15.25	library_load_diagram	228
1.15.26	library_load_diagram(Format)	229
1.15.27	modules_diagram_support	231
1.15.28	uses_diagram	233
1.15.29	uses_diagram(Format)	234
1.15.30	xref_diagram	236

1.15.31	xref_diagram(Format)	237
1.16	dictionaries	240
1.16.1	avltree	240
1.16.2	bintree	242
1.16.3	dictionaryp	244
1.16.4	rbtree	256
1.17	dif	258
1.17.1	dif	258
1.18	doclet	260
1.18.1	doclet	260
1.19	edcg	262
1.19.1	edcg	262
1.20	events	266
1.20.1	after_event_registry	266
1.20.2	before_event_registry	267
1.20.3	event_registry	268
1.20.4	event_registryp	269
1.20.5	monitor	273
1.20.6	monitorp	275
1.21	expand_library_alias_paths	278
1.21.1	expand_library_alias_paths	278
1.22	expecteds	280
1.22.1	either	280
1.22.2	expected	282
1.22.3	expected(Expected)	287
1.23	fcube	295
1.23.1	fcube	295
1.24	flags	299
1.24.1	flags	299
1.24.2	flags_validator	306
1.25	format	308
1.25.1	format	308
1.26	genint	310
1.26.1	genint	310
1.26.2	genint_core	312
1.27	gensym	314
1.27.1	gensym	314
1.27.2	gensym_core	315
1.28	git	318
1.28.1	git	318
1.28.2	git_protocol	319
1.29	grammars	323
1.29.1	blank_grammars(Format)	323
1.29.2	ip_grammars(Format)	330
1.29.3	number_grammars(Format)	331
1.29.4	sequence_grammars	337
1.30	heaps	341
1.30.1	heap(Order)	341
1.30.2	heapp	342
1.30.3	maxheap	347
1.30.4	minheap	349
1.31	help	350
1.31.1	help	350
1.31.2	help_info_support	356

1.32	hierarchies	359
1.32.1	class_hierarchy	359
1.32.2	class_hierarchyp	361
1.32.3	hierarchyp	368
1.32.4	proto_hierarchy	371
1.32.5	proto_hierarchyp	372
1.33	hook_flows	375
1.33.1	hook_pipeline(Pipeline)	375
1.33.2	hook_set(Set)	376
1.34	hook_objects	378
1.34.1	backend_adapter_hook	378
1.34.2	default_workflow_hook	379
1.34.3	grammar_rules_hook	380
1.34.4	identity_hook	382
1.34.5	object_wrapper_hook	383
1.34.6	object_wrapper_hook(Protocol)	384
1.34.7	object_wrapper_hook(Name,Relations)	386
1.34.8	print_goal_hook	387
1.34.9	prolog_module_hook(Module)	388
1.34.10	suppress_goal_hook	390
1.34.11	write_to_file_hook(File)	391
1.34.12	write_to_file_hook(File,Options)	392
1.34.13	write_to_stream_hook(Stream)	394
1.34.14	write_to_stream_hook(Stream,Options)	395
1.35	html	396
1.35.1	html	396
1.35.2	html5	399
1.35.3	xhtml11	400
1.36	ids	401
1.36.1	ids	401
1.36.2	ids(Representation,Bytes)	402
1.37	intervals	404
1.37.1	interval	404
1.37.2	intervalp	406
1.38	iso8601	412
1.38.1	iso8601	412
1.39	issue_creator	424
1.39.1	issue_creator	424
1.40	java	425
1.40.1	java	425
1.40.2	java(Reference)	426
1.40.3	java(Reference,ReturnValue)	428
1.40.4	java_access_protocol	429
1.40.5	java_hook	432
1.40.6	java_utils_protocol	434
1.41	json	443
1.41.1	json	443
1.41.2	json(StringRepresentation)	444
1.41.3	json(ObjectRepresentation,PairRepresentation,StringRepresentation)	445
1.41.4	json_protocol	447
1.42	lgtdoc	449
1.42.1	lgtdoc	449
1.42.2	lgtdoc_messages	452
1.42.3	lgtdocp	453

1.43	lgtunit	465
1.43.1	automation_report	465
1.43.2	coverage_report	466
1.43.3	lgtunit	468
1.43.4	lgtunit_messages	517
1.43.5	minimal_output	518
1.43.6	tap_output	520
1.43.7	tap_report	522
1.43.8	xunit_net_v2_output	524
1.43.9	xunit_net_v2_report	526
1.43.10	xunit_output	527
1.43.11	xunit_report	529
1.44	library	531
1.44.1	cloning	531
1.44.2	counters	532
1.44.3	streamvars	536
1.45	listing	539
1.45.1	listing	539
1.46	logging	542
1.46.1	logger	542
1.46.2	logging	544
1.46.3	loggingp	546
1.47	loops	550
1.47.1	loop	550
1.47.2	loopp	551
1.48	meta	557
1.48.1	meta	557
1.48.2	metap	558
1.49	meta_compiler	569
1.49.1	meta_compiler	569
1.50	metagol	571
1.50.1	metagol	571
1.50.2	metagol_example_protocol	578
1.51	mutations	580
1.51.1	default_atom_mutations	580
1.51.2	default_compound_mutations	582
1.51.3	default_float_mutations	583
1.51.4	default_integer_mutations	584
1.51.5	default_list_mutations	585
1.51.6	mutations	587
1.51.7	mutations_store	588
1.52	nested_dictionaries	591
1.52.1	navltree	591
1.52.2	nbintree	593
1.52.3	nested_dictionary_protocol	594
1.52.4	nrbtree	599
1.53	optionals	600
1.53.1	maybe	600
1.53.2	optional	602
1.53.3	optional(Optional)	606
1.54	options	613
1.54.1	options	614
1.54.2	options_protocol	615
1.55	os	621

1.55.1	os	621
1.55.2	os_types	623
1.55.3	osp	624
1.56	packs	642
1.56.1	pack_protocol	643
1.56.2	packs	647
1.56.3	packs_common	672
1.56.4	packs_messages	684
1.56.5	packs_specs_hook	685
1.56.6	registries	687
1.56.7	registry_loader_hook	698
1.56.8	registry_protocol	700
1.57	pddl_parser	703
1.57.1	pddl	703
1.57.2	read_file	706
1.58	ports_profiler	707
1.58.1	ports_profiler	708
1.59	queues	714
1.59.1	queue	714
1.59.2	queup	715
1.60	random	722
1.60.1	backend_random	722
1.60.2	fast_random	723
1.60.3	pseudo_random_protocol	726
1.60.4	random	728
1.60.5	random_protocol	730
1.61	reader	739
1.61.1	reader	740
1.62	recorded_database	749
1.62.1	recorded_database	749
1.62.2	recorded_database_core	750
1.63	redis	756
1.63.1	redis	756
1.64	sets	759
1.64.1	set	759
1.64.2	set(Type)	760
1.64.3	setp	763
1.65	statistics	773
1.65.1	population	773
1.65.2	sample	774
1.65.3	statistics	775
1.65.4	statisticsp	778
1.66	term_io	789
1.66.1	term_io	789
1.66.2	term_io_protocol	791
1.67	timeout	801
1.67.1	timeout	801
1.68	toychr	803
1.68.1	toychrdb	804
1.69	tsv	809
1.69.1	tsv	809
1.69.2	tsv(Header)	810
1.69.3	tsv_protocol	812
1.70	tutor	821

1.70.1	tutor	821
1.71	types	823
1.71.1	atom	823
1.71.2	atomic	825
1.71.3	callable	826
1.71.4	character	827
1.71.5	characterp	828
1.71.6	comparingp	837
1.71.7	compound	841
1.71.8	difflist	842
1.71.9	float	844
1.71.10	integer	846
1.71.11	list	849
1.71.12	list(Type)	851
1.71.13	listp	852
1.71.14	natural	875
1.71.15	number	876
1.71.16	numberlist	880
1.71.17	numberlistp	881
1.71.18	pairs	891
1.71.19	term	896
1.71.20	termp	898
1.71.21	type	905
1.71.22	varlist	910
1.71.23	varlistp	911
1.72	ulid	921
1.72.1	ulid	921
1.72.2	ulid(Representation)	922
1.72.3	ulid_protocol	924
1.72.4	ulid_types	927
1.73	union_find	928
1.73.1	union_find	928
1.73.2	union_find_protocol	930
1.74	uuid	934
1.74.1	uuid	934
1.74.2	uuid(Representation)	935
1.74.3	uuid_protocol	937
1.75	verdi_neruda	939
1.75.1	a_star_interpreter(W)	940
1.75.2	benchmark_generators	941
1.75.3	best_first	942
1.75.4	bfs_interpreter	944
1.75.5	bup_interpreter	945
1.75.6	counter	946
1.75.7	databasep	950
1.75.8	debug_expansion(Mode)	952
1.75.9	demodb	954
1.75.10	dfs_interpreter	955
1.75.11	flatting	956
1.75.12	heuristic_expansion(Mode)	958
1.75.13	iddfs_interpreter(Increment)	959
1.75.14	interpreterp	960
1.75.15	magic	962
1.75.16	magic_expansion(Mode)	964

1.75.17	rule_expansion(Mode)	965
1.75.18	shell	966
1.75.19	shell(Interpreters)	968
1.75.20	shell_expansion(Mode)	969
1.76	wrapper	970
1.76.1	wrapper	971
1.77	xml_parser	983
1.77.1	xml	983
1.78	zippers	991
1.78.1	zipperp	991
1.78.2	zlist	1001
2	Directories	1005
2.1	contributions/flags/	1007
2.2	contributions/iso8601/	1007
2.3	contributions/pddl_parser/	1007
2.4	contributions/verdi_neruda/	1007
2.5	contributions/xml_parser/	1007
2.6	core/	1007
2.7	library/	1007
2.8	library/arbitrary/	1007
2.9	library/assignvars/	1007
2.10	library/base64/	1007
2.11	library/cbor/	1007
2.12	library/coroutining/	1007
2.13	library/csv/	1007
2.14	library/dates/	1007
2.15	library/dependents/	1007
2.16	library/dictionaries/	1007
2.17	library/dif/	1007
2.18	library/edcg/	1007
2.19	library/events/	1007
2.20	library/expand_library_alias_paths/	1007
2.21	library/expecteds/	1007
2.22	library/format/	1007
2.23	library/genint/	1007
2.24	library/gensym/	1007
2.25	library/git/	1007
2.26	library/grammars/	1007
2.27	library/heaps/	1007
2.28	library/hierarchies/	1007
2.29	library/hook_flows/	1007
2.30	library/hook_objects/	1007
2.31	library/html/	1007
2.32	library/ids/	1007
2.33	library/intervals/	1007
2.34	library/java/	1007
2.35	library/json/	1007
2.36	library/listing/	1007
2.37	library/logging/	1007
2.38	library/loops/	1007
2.39	library/meta/	1007
2.40	library/meta_compiler/	1007
2.41	library/mutations/	1007

2.42	library/nested_dictionaries/	1007
2.43	library/optionals/	1007
2.44	library/options/	1007
2.45	library/os/	1007
2.46	library/queues/	1007
2.47	library/random/	1007
2.48	library/reader/	1007
2.49	library/recorded_database/	1007
2.50	library/redis/	1007
2.51	library/sets/	1007
2.52	library/statistics/	1007
2.53	library/term_io/	1007
2.54	library/timeout/	1007
2.55	library/tsv/	1007
2.56	library/types/	1007
2.57	library/ulid/	1007
2.58	library/union_find/	1007
2.59	library/uuid/	1007
2.60	library/zippers/	1007
2.61	ports/fcube/	1007
2.62	ports/metagol/	1007
2.63	ports/toychr/	1007
2.64	tools/assertions/	1007
2.65	tools/code_metrics/	1007
2.66	tools/dead_code_scanner/	1007
2.67	tools/debug_messages/	1007
2.68	tools/debugger/	1007
2.69	tools/diagrams/	1007
2.70	tools/doclet/	1007
2.71	tools/help/	1007
2.72	tools/issue_creator/	1007
2.73	tools/lgtdoc/	1007
2.74	tools/lgtunit/	1007
2.75	tools/packs/	1007
2.76	tools/ports_profiler/	1007
2.77	tools/tutor/	1007
2.78	tools/wrapper/	1007
3	Entities	1009
3.1	Categories	1009
3.2	Objects	1009
3.3	Protocols	1009
4	Predicates	1011
4.1	(/)/2	1011
4.2	(//)/2	1011
4.3	(<)/2	1011
4.4	(<=)/2	1011
4.5	(:=)/2	1011
4.6	(=<)/2	1012
4.7	(=>)/2	1012
4.8	(=\=)/2	1012
4.9	==~/2	1012
4.10	(>)/2	1012

4.11	(>=)/2	1012
4.12	absolute_file_name/2	1012
4.13	activate_debug_handler/1	1012
4.14	activate_monitor/0	1013
4.15	active_debug_handler/1	1013
4.16	add/1	1013
4.17	add/2	1013
4.18	add/3	1013
4.19	addDependent/1	1013
4.20	after/2	1013
4.21	after/3	1013
4.22	all/0	1014
4.23	all/1	1014
4.24	all_files/0	1014
4.25	all_files/1	1014
4.26	all_libraries/0	1014
4.27	all_libraries/1	1014
4.28	all_score/1	1015
4.29	ancestor/1	1015
4.30	ancestors/1	1015
4.31	apis/0	1015
4.32	apis/1	1015
4.33	append/2	1015
4.34	append/3	1015
4.35	apply/2	1015
4.36	apply/4	1016
4.37	approximately_equal/2	1016
4.38	approximately_equal/3	1016
4.39	arbitrary/1	1016
4.40	arbitrary/2	1016
4.41	archive/1	1016
4.42	arithmetic_mean/2	1016
4.43	array_list/2	1016
4.44	array_to_list/2	1017
4.45	array_to_terms/2	1017
4.46	array_to_terms/3	1017
4.47	as_curly_bracketed/2	1017
4.48	as_dictionary/2	1017
4.49	as_difflist/2	1017
4.50	as_heap/2	1017
4.51	as_list/2	1017
4.52	as_nested_dictionary/2	1018
4.53	as_set/2	1018
4.54	ask_question/5	1018
4.55	assertion/1	1018
4.56	assertion/2	1018
4.57	assignable/1	1018
4.58	assignable/2	1018
4.59	available/0	1018
4.60	available/1	1019
4.61	available/2	1019
4.62	average/2	1019
4.63	average_deviation/3	1019
4.64	before/2	1019

4.65	before/3	1019
4.66	bench_goal/1	1019
4.67	benchmark/2	1019
4.68	benchmark/3	1020
4.69	benchmark/4	1020
4.70	benchmark_reified/3	1020
4.71	between/3	1020
4.72	bit//1	1020
4.73	bits//1	1020
4.74	blank//0	1020
4.75	blanks//0	1020
4.76	body_pred/1	1021
4.77	branch/2	1021
4.78	built_in_directive/4	1021
4.79	built_in_flag/2	1021
4.80	built_in_method/4	1021
4.81	built_in_non_terminal/4	1021
4.82	built_in_predicate/4	1021
4.83	calendar_month/3	1021
4.84	call_with_timeout/2	1022
4.85	call_with_timeout/3	1022
4.86	cat/2	1022
4.87	change_directory/1	1022
4.88	changed/0	1022
4.89	changed/1	1022
4.90	chebyshev_distance/3	1022
4.91	chebyshev_norm/2	1022
4.92	check/1	1023
4.93	check/2	1023
4.94	check/3	1023
4.95	check_option/1	1023
4.96	check_options/1	1023
4.97	chr_is/2	1023
4.98	chr_no_spy/1	1023
4.99	chr_nospy/0	1023
4.100	chr_notrace/0	1024
4.101	chr_option/2	1024
4.102	chr_spy/1	1024
4.103	chr_trace/0	1024
4.104	class/1	1024
4.105	classes/1	1024
4.106	clause/5	1024
4.107	clause_location/6	1024
4.108	clean/0	1025
4.109	clean/1	1025
4.110	clean/2	1025
4.111	clone/1	1025
4.112	clone/3	1025
4.113	clone/4	1025
4.114	coefficient_of_variation/2	1025
4.115	command_line_arguments/1	1026
4.116	commit_author/2	1026
4.117	commit_date/2	1026
4.118	commit_hash/2	1026

4.119	commit_hash_abbreviated/2	1026
4.120	commit_log/3	1026
4.121	commit_message/2	1026
4.122	compile_aux_clauses/1	1026
4.123	compile_predicate_heads/4	1027
4.124	compile_predicate_indicators/3	1027
4.125	completion/2	1027
4.126	completions/2	1027
4.127	connect/1	1027
4.128	connect/3	1027
4.129	console/1	1027
4.130	contains/2	1027
4.131	control//0	1028
4.132	control_construct/4	1028
4.133	controls//0	1028
4.134	copy_file/2	1028
4.135	counter/2	1028
4.136	cover/1	1028
4.137	cpu_time/1	1028
4.138	current/2	1028
4.139	data/0	1029
4.140	data/1	1029
4.141	data/2	1029
4.142	date/4	1029
4.143	date/5	1029
4.144	date/6	1029
4.145	date/7	1029
4.146	date_string/3	1029
4.147	date_time/7	1030
4.148	days_in_month/3	1030
4.149	deactivate_debug_handler/0	1030
4.150	debug/0	1030
4.151	debug_handler/1	1030
4.152	debug_handler/3	1030
4.153	debugging/0	1030
4.154	debugging/1	1030
4.155	decide/1	1031
4.156	decide/2	1031
4.157	decode_exception/2	1031
4.158	decode_exception/3	1031
4.159	decompile_predicate_heads/4	1031
4.160	decompile_predicate_indicators/4	1031
4.161	decompose_file_name/3	1031
4.162	decompose_file_name/4	1031
4.163	decrement_counter/1	1032
4.164	default_option/1	1032
4.165	default_options/1	1032
4.166	define_log_file/2	1032
4.167	defined/4	1032
4.168	defined_flag/6	1032
4.169	del_monitors/0	1032
4.170	del_monitors/4	1032
4.171	del_spy_points/4	1033
4.172	delete/0	1033

4.173 delete/1	1033
4.174 delete/2	1033
4.175 delete/3	1033
4.176 delete/4	1033
4.177 delete_all_after/2	1033
4.178 delete_all_after_and_unzip/2	1033
4.179 delete_all_before/2	1034
4.180 delete_all_before_and_unzip/2	1034
4.181 delete_and_next/2	1034
4.182 delete_and_previous/2	1034
4.183 delete_and_unzip/2	1034
4.184 delete_directory/1	1034
4.185 delete_directory_and_contents/1	1034
4.186 delete_directory_contents/1	1034
4.187 delete_file/1	1035
4.188 delete_in/4	1035
4.189 delete_matches/3	1035
4.190 delete_max/4	1035
4.191 delete_min/4	1035
4.192 dependents/1	1035
4.193 dependents/2	1035
4.194 dependents/3	1035
4.195 depth/2	1036
4.196 descendant/1	1036
4.197 descendant_class/1	1036
4.198 descendant_classes/1	1036
4.199 descendant_instance/1	1036
4.200 descendant_instances/1	1036
4.201 descendants/1	1036
4.202 describe/1	1036
4.203 describe/2	1037
4.204 description/1	1037
4.205 deterministic/1	1037
4.206 deterministic/2	1037
4.207 diagram_description/1	1037
4.208 diagram_name_suffix/1	1037
4.209 dif/1	1037
4.210 dif/2	1037
4.211 digit//1	1038
4.212 digits//1	1038
4.213 directories/1	1038
4.214 directories/2	1038
4.215 directories/3	1038
4.216 directory/1	1038
4.217 directory/2	1039
4.218 directory/3	1039
4.219 directory_exists/1	1039
4.220 directory_files/2	1039
4.221 directory_files/3	1039
4.222 directory_score/2	1039
4.223 disable/1	1040
4.224 disable/2	1040
4.225 disable_logging/1	1040
4.226 disconnect/1	1040

4.227 disjoint/2	1040
4.228 disjoint_sets/2	1040
4.229 doc_goal/1	1040
4.230 dot//1	1040
4.231 dowhile/2	1041
4.232 drop/3	1041
4.233 during/2	1041
4.234 easter_day/3	1041
4.235 edge/6	1041
4.236 edge_case/2	1041
4.237 either/3	1041
4.238 empty/1	1041
4.239 enable/1	1042
4.240 enable/2	1042
4.241 enable_logging/1	1042
4.242 enabled/1	1042
4.243 enabled/2	1042
4.244 ensure_directory/1	1042
4.245 ensure_file/1	1042
4.246 entity/1	1042
4.247 entity/2	1043
4.248 entity_info_pair_score_hook/3	1043
4.249 entity_info_score_hook/2	1043
4.250 entity_predicates_weights_hook/2	1043
4.251 entity_prefix/2	1043
4.252 entity_score/2	1043
4.253 enumerate/2	1043
4.254 environment_variable/2	1043
4.255 epsilon/1	1044
4.256 equal/2	1044
4.257 erase/1	1044
4.258 essentially_equal/3	1044
4.259 euclidean_distance/3	1044
4.260 euclidean_norm/2	1044
4.261 exclude/3	1044
4.262 execution_context/7	1044
4.263 expand_library_path/2	1045
4.264 expected/1	1045
4.265 expecteds/2	1045
4.266 explain//1	1045
4.267 extension/1	1045
4.268 extensions/1	1045
4.269 false/1	1045
4.270 fcube/0	1045
4.271 file/1	1046
4.272 file/2	1046
4.273 file_exists/1	1046
4.274 file_footer/3	1046
4.275 file_header/3	1046
4.276 file_modification_time/2	1046
4.277 file_permission/2	1047
4.278 file_score/2	1047
4.279 file_size/2	1047
4.280 file_to_bytes/2	1047

4.281 file_to_bytes/3	1047
4.282 file_to_chars/2	1047
4.283 file_to_chars/3	1047
4.284 file_to_codes/2	1047
4.285 file_to_codes/3	1048
4.286 file_to_terms/2	1048
4.287 file_to_terms/3	1048
4.288 file_type_extension/2	1048
4.289 files/1	1048
4.290 files/2	1048
4.291 files/3	1048
4.292 filter/2	1049
4.293 find/4	1049
4.294 find/5	1049
4.295 findall_member/4	1049
4.296 findall_member/5	1049
4.297 finished_by/2	1049
4.298 finishes/2	1049
4.299 flag_group_chk/1	1049
4.300 flag_groups/1	1050
4.301 flat_map/2	1050
4.302 flatten/2	1050
4.303 float//1	1050
4.304 fold_left/4	1050
4.305 fold_left_1/3	1050
4.306 fold_right/4	1050
4.307 fold_right_1/3	1050
4.308 fordownto/3	1051
4.309 fordownto/4	1051
4.310 fordownto/5	1051
4.311 foreach/3	1051
4.312 foreach/4	1051
4.313 format/2	1051
4.314 format/3	1051
4.315 format_entity_score//2	1051
4.316 format_object/1	1052
4.317 format_to_atom/3	1052
4.318 format_to_chars/3	1052
4.319 format_to_chars/4	1052
4.320 format_to_codes/3	1052
4.321 format_to_codes/4	1052
4.322 forto/3	1052
4.323 forto/4	1052
4.324 forto/5	1053
4.325 forward/1	1053
4.326 forward/2	1053
4.327 forward/3	1053
4.328 fractile/3	1053
4.329 freeze/2	1053
4.330 from_generator/2	1053
4.331 from_generator/3	1053
4.332 from_generator/4	1054
4.333 from_goal/2	1054
4.334 from_goal/3	1054

4.335	from_goal/4	1054
4.336	frozen/2	1054
4.337	full_device_path/1	1054
4.338	func_test/3	1054
4.339	functional/0	1054
4.340	generate/1	1055
4.341	generate/2	1055
4.342	generate/8	1055
4.343	genint/2	1055
4.344	gensym/2	1055
4.345	geometric_mean/2	1055
4.346	get/1	1055
4.347	get_field/2	1056
4.348	get_flag_value/2	1056
4.349	get_seed/1	1056
4.350	gnu/0	1056
4.351	goal_expansion/2	1056
4.352	graph_footer/5	1056
4.353	graph_header/5	1056
4.354	ground/1	1056
4.355	group_by_key/2	1057
4.356	group_consecutive_by_key/2	1057
4.357	group_sorted_by_key/2	1057
4.358	guess_arity/2	1057
4.359	guess_separator/2	1057
4.360	hamming_distance/3	1057
4.361	handbook/0	1057
4.362	handbook/1	1057
4.363	harmonic_mean/2	1058
4.364	head/2	1058
4.365	head_pred/1	1058
4.366	help/0	1058
4.367	hex_digit//1	1058
4.368	hex_digits//1	1058
4.369	home/1	1058
4.370	ibk/3	1058
4.371	if_empty/1	1059
4.372	if_expected/1	1059
4.373	if_expected_or_else/2	1059
4.374	if_present/1	1059
4.375	if_present_or_else/2	1059
4.376	if_unexpected/1	1059
4.377	include/3	1059
4.378	increase/1	1059
4.379	increment/0	1060
4.380	increment_counter/1	1060
4.381	init/0	1060
4.382	init_log_file/2	1060
4.383	inorder/2	1060
4.384	insert/3	1060
4.385	insert/4	1060
4.386	insert_after/3	1060
4.387	insert_all/3	1061
4.388	insert_before/3	1061

4.389	insert_in/4	1061
4.390	install/1	1061
4.391	install/2	1061
4.392	install/3	1061
4.393	install/4	1061
4.394	installed/0	1061
4.395	installed/1	1062
4.396	installed/3	1062
4.397	installed/4	1062
4.398	instance/1	1062
4.399	instance/2	1062
4.400	instances/1	1062
4.401	integer//1	1062
4.402	internal_os_path/2	1062
4.403	intersect/2	1063
4.404	intersection/2	1063
4.405	intersection/3	1063
4.406	intersection/4	1063
4.407	invoke/1	1063
4.408	invoke/2	1063
4.409	ipv4//1	1063
4.410	ipv6//1	1063
4.411	is_absolute_file_name/1	1064
4.412	is_alpha/1	1064
4.413	is_alphanumeric/1	1064
4.414	is_ascii/1	1064
4.415	is_bin_digit/1	1064
4.416	is_control/1	1064
4.417	is_dec_digit/1	1064
4.418	is_empty/0	1064
4.419	is_end_of_line/1	1065
4.420	is_expected/0	1065
4.421	is_false/1	1065
4.422	is_hex_digit/1	1065
4.423	is_layout/1	1065
4.424	is_letter/1	1065
4.425	is_lower_case/1	1065
4.426	is_newline/1	1065
4.427	is_null/1	1066
4.428	is_object/1	1066
4.429	is_octal_digit/1	1066
4.430	is_period/1	1066
4.431	is_present/0	1066
4.432	is_punctuation/1	1066
4.433	is_quote/1	1066
4.434	is_true/1	1066
4.435	is_unexpected/0	1067
4.436	is_upper_case/1	1067
4.437	is_void/1	1067
4.438	is_vowel/1	1067
4.439	is_white_space/1	1067
4.440	iterator_element/2	1067
4.441	join/3	1067
4.442	join_all/3	1067

4.443	jump/3	1068
4.444	jump_all/3	1068
4.445	jump_all_block/3	1068
4.446	key/2	1068
4.447	keys/2	1068
4.448	keys_values/3	1068
4.449	keysort/2	1068
4.450	kurtosis/2	1068
4.451	language_object/2	1069
4.452	last/2	1069
4.453	leaf/1	1069
4.454	leaf_class/1	1069
4.455	leaf_classes/1	1069
4.456	leaf_instance/1	1069
4.457	leaf_instances/1	1069
4.458	leap_year/1	1069
4.459	learn/0	1070
4.460	learn/1	1070
4.461	learn/2	1070
4.462	learn/3	1070
4.463	learn_seq/2	1070
4.464	learn_with_timeout/4	1070
4.465	leash/1	1070
4.466	leashing/1	1070
4.467	least_common_multiple/2	1071
4.468	leaves/1	1071
4.469	length/2	1071
4.470	libraries/1	1071
4.471	libraries/2	1071
4.472	libraries/3	1071
4.473	library/0	1072
4.474	library/1	1072
4.475	library/2	1072
4.476	library_score/2	1072
4.477	license/1	1072
4.478	line_to_chars/2	1072
4.479	line_to_chars/3	1073
4.480	line_to_codes/2	1073
4.481	line_to_codes/3	1073
4.482	lint/0	1073
4.483	lint/1	1073
4.484	lint/2	1073
4.485	list/0	1073
4.486	list_to_array/2	1073
4.487	listing/0	1074
4.488	listing/1	1074
4.489	loaded_file/1	1074
4.490	loaded_file_property/2	1074
4.491	log/3	1074
4.492	log_event/2	1074
4.493	log_file/2	1074
4.494	logging/1	1074
4.495	logging/3	1075
4.496	logtalk_packs/0	1075

4.497	logtalk_packs/1	1075
4.498	lookup/2	1075
4.499	lookup/3	1075
4.500	lookup_in/3	1075
4.501	lower_upper/2	1075
4.502	magic/2	1075
4.503	magicise/4	1076
4.504	make_directory/1	1076
4.505	make_directory_path/1	1076
4.506	make_set/3	1076
4.507	man/1	1076
4.508	manhattan_distance/3	1076
4.509	manhattan_norm/2	1076
4.510	manuals/0	1076
4.511	map/2	1077
4.512	map/3	1077
4.513	map/4	1077
4.514	map/5	1077
4.515	map/6	1077
4.516	map/7	1077
4.517	map/8	1078
4.518	map_element/2	1078
4.519	map_reduce/5	1078
4.520	max/2	1078
4.521	max/3	1078
4.522	max_clauses/1	1078
4.523	max_inv_preds/1	1078
4.524	max_size/1	1078
4.525	maybe/0	1079
4.526	maybe/1	1079
4.527	maybe/2	1079
4.528	maybe_call/1	1079
4.529	maybe_call/2	1079
4.530	mean_deviation/2	1079
4.531	median/2	1079
4.532	median_deviation/2	1079
4.533	meets/2	1080
4.534	member/2	1080
4.535	memberchk/2	1080
4.536	merge/3	1080
4.537	message_hook/4	1080
4.538	message_prefix_file/6	1080
4.539	message_prefix_stream/4	1080
4.540	message_tokens//2	1081
4.541	met_by/2	1081
4.542	meta_type/3	1081
4.543	metarule/6	1081
4.544	metarule_next_id/1	1081
4.545	min/2	1081
4.546	min/3	1081
4.547	min_clauses/1	1081
4.548	min_max/3	1082
4.549	modes/2	1082
4.550	module_property/2	1082

4.551	monitor/1	1082
4.552	monitor/4	1082
4.553	monitor_activated/0	1082
4.554	monitored/1	1082
4.555	monitors/1	1082
4.556	msort/2	1083
4.557	msort/3	1083
4.558	mutation/3	1083
4.559	name/1	1083
4.560	name_of_day/3	1083
4.561	name_of_month/3	1083
4.562	natural//1	1083
4.563	new/1	1083
4.564	new/2	1084
4.565	new/3	1084
4.566	new_line//0	1084
4.567	new_lines//0	1084
4.568	next/2	1084
4.569	next/3	1084
4.570	next/4	1084
4.571	nextto/3	1084
4.572	node/7	1085
4.573	nodebug/0	1085
4.574	nolog/3	1085
4.575	nologall/0	1085
4.576	non_blank//1	1085
4.577	non_blanks//1	1085
4.578	normal_element/2	1085
4.579	normalize_range/2	1085
4.580	normalize_range/4	1086
4.581	normalize_scalar/2	1086
4.582	normalize_unit/2	1086
4.583	nosp/1	1086
4.584	nosp/3	1086
4.585	nosp/4	1086
4.586	nosp/all/0	1086
4.587	note/2	1086
4.588	note/3	1087
4.589	notrace/0	1087
4.590	now/3	1087
4.591	nth0/3	1087
4.592	nth0/4	1087
4.593	nth1/3	1087
4.594	nth1/4	1087
4.595	null/1	1088
4.596	null_device_path/1	1088
4.597	number//1	1088
4.598	number_of_tests/1	1088
4.599	numbervars/1	1088
4.600	numbervars/3	1088
4.601	occurrences/2	1088
4.602	occurrences/3	1088
4.603	occurs/2	1089
4.604	of/2	1089

4.605 of_expected/2	1089
4.606 of_unexpected/2	1089
4.607 one_or_more//0	1089
4.608 one_or_more//1	1089
4.609 one_or_more//2	1089
4.610 operating_system_machine/1	1089
4.611 operating_system_name/1	1090
4.612 operating_system_release/1	1090
4.613 operating_system_type/1	1090
4.614 option/2	1090
4.615 option/3	1090
4.616 or/2	1090
4.617 or_else/2	1090
4.618 or_else_call/2	1090
4.619 or_else_fail/1	1091
4.620 or_else_get/2	1091
4.621 or_else_throw/1	1091
4.622 or_else_throw/2	1091
4.623 orphaned/0	1091
4.624 orphaned/2	1091
4.625 outdated/0	1091
4.626 outdated/1	1091
4.627 outdated/4	1092
4.628 output_file_name/2	1092
4.629 overlapped_by/2	1092
4.630 overlaps/2	1092
4.631 parent/1	1092
4.632 parenthesis/2	1092
4.633 parents/1	1092
4.634 parse/2	1092
4.635 parse/3	1093
4.636 parse_domain/2	1093
4.637 parse_domain/3	1093
4.638 parse_problem/2	1093
4.639 parse_problem/3	1093
4.640 partial_map/4	1093
4.641 partition/3	1093
4.642 partition/4	1093
4.643 partition/5	1094
4.644 partition/6	1094
4.645 path_concat/3	1094
4.646 permutation/2	1094
4.647 pid/1	1094
4.648 pin/0	1094
4.649 pin/1	1094
4.650 pinned/1	1094
4.651 plus/3	1095
4.652 port/5	1095
4.653 portray_clause/1	1095
4.654 postorder/2	1095
4.655 powerset/2	1095
4.656 pp/1	1095
4.657 pprint/1	1095
4.658 predicate/2	1095

4.659	predicate_info_pair_score_hook/4	1096
4.660	predicate_info_score_hook/3	1096
4.661	predicate_mode_score_hook/3	1096
4.662	predicate_mode_score_hook/5	1096
4.663	predicates/2	1096
4.664	prefix/0	1096
4.665	prefix/1	1096
4.666	prefix/2	1096
4.667	prefix/3	1097
4.668	preorder/2	1097
4.669	previous/2	1097
4.670	previous/3	1097
4.671	previous/4	1097
4.672	print_flags/0	1097
4.673	print_flags/1	1097
4.674	print_message/3	1097
4.675	print_message_token/4	1098
4.676	print_message_tokens/3	1098
4.677	product/2	1098
4.678	product/3	1098
4.679	program_to_clauses/2	1098
4.680	proper_prefix/2	1098
4.681	proper_prefix/3	1098
4.682	proper_suffix/2	1098
4.683	proper_suffix/3	1099
4.684	prove/2	1099
4.685	prove/3	1099
4.686	provides/2	1099
4.687	question_hook/6	1099
4.688	question_prompt_stream/4	1099
4.689	quick_check/1	1099
4.690	quick_check/2	1099
4.691	quick_check/3	1100
4.692	random/1	1100
4.693	random/3	1100
4.694	random_node/1	1100
4.695	random_tree/1	1100
4.696	randomize/1	1100
4.697	randseq/4	1100
4.698	randset/4	1100
4.699	range/2	1101
4.700	rdirectories/1	1101
4.701	rdirectories/2	1101
4.702	rdirectory/1	1101
4.703	rdirectory/2	1101
4.704	rdirectory/3	1101
4.705	rdirectory_score/2	1102
4.706	read_file/2	1102
4.707	read_file/3	1102
4.708	read_file_by_line/2	1102
4.709	read_file_by_line/3	1102
4.710	read_from_atom/2	1102
4.711	read_from_chars/2	1102
4.712	read_from_codes/2	1103

4.713 read_only_device_path/1	1103
4.714 read_stream/2	1103
4.715 read_stream/3	1103
4.716 read_stream_by_line/2	1103
4.717 read_stream_by_line/3	1103
4.718 read_term_from_atom/3	1103
4.719 read_term_from_chars/3	1104
4.720 read_term_from_chars/4	1104
4.721 read_term_from_codes/3	1104
4.722 read_term_from_codes/4	1104
4.723 readme/1	1104
4.724 readme/2	1104
4.725 recorda/2	1104
4.726 recorda/3	1104
4.727 recorded/2	1105
4.728 recorded/3	1105
4.729 recordz/2	1105
4.730 recordz/3	1105
4.731 relative_standard_deviation/2	1105
4.732 removeDependent/1	1105
4.733 remove_duplicates/2	1105
4.734 rename_file/2	1105
4.735 replace/3	1106
4.736 replace_sub_atom/4	1106
4.737 rescale/3	1106
4.738 reset/0	1106
4.739 reset/1	1106
4.740 reset_counter/1	1106
4.741 reset_counters/0	1106
4.742 reset_flags/0	1106
4.743 reset_flags/1	1107
4.744 reset_genint/0	1107
4.745 reset_genint/1	1107
4.746 reset_gensym/0	1107
4.747 reset_gensym/1	1107
4.748 reset_monitor/0	1107
4.749 reset_seed/0	1107
4.750 restore/1	1107
4.751 restore/2	1108
4.752 reverse/2	1108
4.753 rewind/2	1108
4.754 rewind/3	1108
4.755 rlibraries/1	1108
4.756 rlibraries/2	1108
4.757 rlibrary/1	1108
4.758 rlibrary/2	1109
4.759 rlibrary_score/2	1109
4.760 rule/2	1109
4.761 rule/3	1109
4.762 rule/4	1109
4.763 run/0	1109
4.764 run/1	1109
4.765 run/2	1110
4.766 run_test_sets/1	1110

4.767	same_length/2	1110
4.768	same_length/3	1110
4.769	save/0	1110
4.770	save/1	1110
4.771	save/2	1110
4.772	scalar_product/3	1110
4.773	scan_left/4	1111
4.774	scan_left_1/3	1111
4.775	scan_right/4	1111
4.776	scan_right_1/3	1111
4.777	search/1	1111
4.778	select/3	1111
4.779	select/4	1111
4.780	selectchk/3	1112
4.781	selectchk/4	1112
4.782	send/3	1112
4.783	sequence/3	1112
4.784	sequence/4	1112
4.785	sequential_occurrences/2	1112
4.786	sequential_occurrences/3	1112
4.787	serve/3	1112
4.788	set/1	1113
4.789	set/4	1113
4.790	set_element/2	1113
4.791	set_field/2	1113
4.792	set_flag_value/2	1113
4.793	set_flag_value/3	1113
4.794	set_monitor/4	1113
4.795	set_seed/1	1113
4.796	set_spy_point/4	1114
4.797	setup/0	1114
4.798	shell/1	1114
4.799	shell/2	1114
4.800	shell_command/1	1114
4.801	shrink/3	1114
4.802	shrink_sequence/3	1114
4.803	shrinker/1	1114
4.804	sign//1	1115
4.805	singletons/2	1115
4.806	size/2	1115
4.807	skewness/2	1115
4.808	sleep/1	1115
4.809	sort/2	1115
4.810	sort/3	1115
4.811	sort/4	1115
4.812	source_file_extension/1	1116
4.813	space//0	1116
4.814	spaces//0	1116
4.815	split/3	1116
4.816	split/4	1116
4.817	spy/1	1116
4.818	spy/3	1116
4.819	spy/4	1116
4.820	spy_point/4	1117

4.821	spying/1	1117
4.822	spying/3	1117
4.823	spying/4	1117
4.824	standard_deviation/2	1117
4.825	start/0	1117
4.826	start_redirect_to_file/2	1117
4.827	started_by/2	1117
4.828	starts/2	1118
4.829	stop/0	1118
4.830	stop_redirect_to_file/0	1118
4.831	stream_to_bytes/2	1118
4.832	stream_to_bytes/3	1118
4.833	stream_to_chars/2	1118
4.834	stream_to_chars/3	1118
4.835	stream_to_codes/2	1118
4.836	stream_to_codes/3	1119
4.837	stream_to_terms/2	1119
4.838	stream_to_terms/3	1119
4.839	subclass/1	1119
4.840	subclasses/1	1119
4.841	sublist/2	1119
4.842	subsequence/3	1119
4.843	subsequence/4	1119
4.844	subset/2	1120
4.845	substitute/4	1120
4.846	subsumes/2	1120
4.847	subterm/2	1120
4.848	subtract/3	1120
4.849	succ/2	1120
4.850	suffix/2	1120
4.851	suffix/3	1121
4.852	sum/2	1121
4.853	superclass/1	1121
4.854	superclasses/1	1121
4.855	suspend_monitor/0	1121
4.856	swap/2	1121
4.857	swap_consecutive/2	1121
4.858	syndiff/3	1121
4.859	tab/0	1122
4.860	tabs//0	1122
4.861	take/3	1122
4.862	temporary_directory/1	1122
4.863	term_expansion/2	1122
4.864	terms_to_array/2	1122
4.865	test/1	1122
4.866	time_stamp/1	1122
4.867	timeout/1	1123
4.868	timestamp/2	1123
4.869	timestamp/8	1123
4.870	today/3	1123
4.871	tolerance_equal/4	1123
4.872	top/3	1123
4.873	top_next/5	1123
4.874	trace/0	1123

4.875	trace_event/2	1124
4.876	transpose/2	1124
4.877	true/1	1124
4.878	type/1	1124
4.879	unexpected/1	1124
4.880	unexpecteds/2	1124
4.881	uninstall/0	1124
4.882	uninstall/1	1124
4.883	uninstall/2	1125
4.884	union/3	1125
4.885	union/4	1125
4.886	union_all/3	1125
4.887	unpin/0	1125
4.888	unpin/1	1125
4.889	unzip/2	1125
4.890	update/0	1125
4.891	update/1	1126
4.892	update/2	1126
4.893	update/3	1126
4.894	update/4	1126
4.895	update/5	1126
4.896	update_in/4	1126
4.897	update_in/5	1126
4.898	uuid_null/1	1127
4.899	uuid_v1/2	1127
4.900	uuid_v4/1	1127
4.901	valid/1	1127
4.902	valid/2	1127
4.903	valid/3	1127
4.904	valid_date/3	1127
4.905	valid_option/1	1128
4.906	valid_options/1	1128
4.907	validate/1	1128
4.908	value/1	1128
4.909	value/3	1128
4.910	value_reference/2	1128
4.911	values/2	1128
4.912	variables/2	1128
4.913	variance/2	1129
4.914	variant/2	1129
4.915	varnumbers/2	1129
4.916	varnumbers/3	1129
4.917	verify_commands_availability/0	1129
4.918	version/6	1129
4.919	versions/3	1129
4.920	void/1	1129
4.921	void_element/1	1130
4.922	wall_time/1	1130
4.923	weighted_mean/3	1130
4.924	welcome/0	1130
4.925	when/2	1130
4.926	whiledo/2	1130
4.927	white_space//0	1130
4.928	white_spaces//0	1130

4.929	with_output_to/2	1131
4.930	without//2	1131
4.931	working_directory/1	1131
4.932	write_file/3	1131
4.933	write_stream/3	1131
4.934	write_term_to_atom/3	1131
4.935	write_term_to_chars/3	1131
4.936	write_term_to_chars/4	1131
4.937	write_term_to_codes/3	1132
4.938	write_term_to_codes/4	1132
4.939	write_to_atom/2	1132
4.940	write_to_chars/2	1132
4.941	write_to_codes/2	1132
4.942	z_normalization/2	1132
4.943	zero_or_more//0	1132
4.944	zero_or_more//1	1132
4.945	zero_or_more//2	1133
4.946	zip/2	1133
4.947	zip/3	1133
4.948	zip_at_index/4	1133
5	Indices and tables	1135
	Index	1137

LIBRARIES

To load any library (including developer tools, ports, and contributions), use the goal `logtalk_load(library_name(loader))`. To run the library tests, use the goal `logtalk_load(library_name(tester))`. To load an entity, always load the loader file of the library that includes it to ensure that all required dependencies are also loaded and that any required flags are used. The loading goal can be found in the entity documentation.

1.1 arbitrary

category

1.1.1 arbitrary

Adds predicates for generating and shrinking random values for selected types to the library type object. User extensible.

Availability:

```
logtalk_load(arbitrary(loader))
```

Author: Paulo Moura

Version: 2:35:1

Date: 2024-08-13

Compilation flags:

```
static
```

Complements:

```
type
```

Uses:

```
fast_random
```

```
integer
```

```
list
```

```
type
```

Remarks:

- Logtalk specific types: `entity`, `object`, `protocol`, `category`, `entity_identifier`, `object_identifier`, `protocol_identifier`, `category_identifier`, `event`, `predicate`.
- Prolog module related types (when the backend compiler supports modules): `module`, `module_identifier`, `qualified_callable`.
- Prolog base types: `term`, `var`, `nonvar`, `atomic`, `atom`, `number`, `integer`, `float`, `compound`, `callable`, `ground`.
- Atom derived types: `non_quoted_atom`, `non_empty_atom`, `non_empty_atom(CharSet)`, `boolean`, `character`, `in_character`, `char`, `operator_specifier`, `hex_char`.
- Atom derived parametric types: `atom(CharSet)`, `atom(CharSet,Length)`, `non_empty_atom(CharSet)`, `character(CharSet)`, `in_character(CharSet)`, `char(CharSet)`.
- Number derived types: `positive_number`, `negative_number`, `non_positive_number`, `non_negative_number`.
- Float derived types: `positive_float`, `negative_float`, `non_positive_float`, `non_negative_float`, `probability`.
- Integer derived types: `positive_integer`, `negative_integer`, `non_positive_integer`, `non_negative_integer`, `byte`, `in_byte`, `character_code`, `in_character_code`, `code`, `operator_priority`, `hex_code`.
- Integer derived parametric types: `character_code(CharSet)`, `in_character_code(CharSet)`, `code(CharSet)`.
- List types (compound derived types): `list`, `non_empty_list`, `partial_list`, `list_or_partial_list`, `list(Type)`, `list(Type,Length)`, `list(Type,Min,Max)`, `list(Type,Length,Min,Max)`, `non_empty_list(Type)`, `codes`, `chars`.
- Difference list types (compound derived types): `difference_list`, `difference_list(Type)`.
- List and difference list types length: The types that do not take a fixed length generate lists with a length in the `[0,MaxSize]` interval (`[1,MaxSize]` for non-empty list types).
- Predicate and non-terminal indicator types arity: These types generate indicators with an arity in the `[0,MaxSize]` interval.
- Other compound derived types: `compound(Name,Types)`, `predicate_indicator`, `non_terminal_indicator`, `predicate_or_non_terminal_indicator`, `clause`, `grammar_rule`, `pair`, `pair(KeyType,ValueType)`.
- Other types: `Object::Closure`, `between(Type,Lower,Upper)`, `property(Type,LambdaExpression)`, `one_of(Type,Set)`, `var_or(Type)`, `ground(Type)`, `types(Types)`, `types_frequency(Pairs)`, `transform(Type,Closure)`, `constrain(Type,Closure)`.
- Type `Object::Closure` notes: Allows calling public object predicates as generators and shrinkers. The `Closure` closure is extended with either a single argument, the generated arbitrary value, or with two arguments, when shrinking a value.
- Type `compound(Name,Types)` notes: Generate a random compound term with the given name with a random argument for each type.
- Type `types_frequency(Pairs)` notes: Generate a random term for one of the types in a list of Type-Frequency pairs. The type is randomly selected taking into account the types frequency.
- Type `transform(Type,Closure)` notes: Generate a random term by transforming the term generated for the given type using the given closure.

- Type constrain(Type,Closure) notes: Generate a random term for the given type that satisfy the given closure.
- Registering new types: Add clauses for the arbitrary/1-2 multifile predicates and optionally for the shrinker/1 and shrink/3 multifile predicates. The clauses must have a bound first argument to avoid introducing spurious choice-points.
- Shrinking values: The shrink/3 should either succeed or fail but never throw an exception.
- Character sets: ascii_identifier, ascii_printable, ascii_full, byte, unicode_bmp, unicode_full.
- Default character sets: The default character set when using a parameterizable type that takes a character set parameter depends on the type.
- Default character sets: Entity, predicate, and non-terminal identifier types plus compound and callable types default to an ascii_identifier functor. Character and character code types default to ascii_full. Other types default to ascii_printable.
- Caveats: The type argument (and any type parameterization) to the predicates is not type-checked (or checked for consistency) for performance reasons.
- Unicode limitations: Currently, correct character/code generation is only ensured for XVM and SWI-Prolog as other backends do not provide support for querying a Unicode code point category.

Inherited public predicates:

(none)

- Public predicates
 - arbitrary/1
 - arbitrary/2
 - shrinker/1
 - shrink/3
 - shrink_sequence/3
 - edge_case/2
 - get_seed/1
 - set_seed/1
 - max_size/1
- Protected predicates
- Private predicates
- Operators

Public predicates

arbitrary/1

Table of defined types for which an arbitrary value can be generated. A new type can be registered by defining a clause for this predicate and adding a clause for the arbitrary/2 multifile predicate.

Compilation flags:

static, multifile

Template:

arbitrary(Type)

Mode and number of proofs:

arbitrary(?callable) - zero_or_more

arbitrary/2

Generates an arbitrary term of the specified type. Fails if the type is not supported. A new generator can be defined by adding a clause for this predicate and registering it via the arbitrary/1 predicate.

Compilation flags:

static, multifile

Template:

arbitrary(Type,Term)

Meta-predicate template:

arbitrary(:,*)

Mode and number of proofs:

arbitrary(@callable,-term) - zero_or_one

shrinker/1

Table of defined types for which a shrinker is provided. A new shrinker can be registered by defining a clause for this predicate and adding a definition for the shrink/3 multifile predicate.

Compilation flags:

static, multifile

Template:

shrinker(Type)

Mode and number of proofs:

shrinker(?callable) - zero_or_more

shrink/3

Shrinks a value to a smaller value if possible. Must generate a finite number of solutions. Fails if the type is not supported. A new shrinker can be defined by adding a clause for this predicate and registering it via the shrinker/1 predicate.

Compilation flags:

static, multifile

Template:

shrink(Type, Large, Small)

Mode and number of proofs:

shrink(@callable, @term, -term) - zero_or_more

shrink_sequence/3

Shrinks a value repeatedly until shrinking is no longer possible returning the sequence of values (ordered from larger to smaller value). Fails if the type is not supported.

Compilation flags:

static

Template:

shrink_sequence(Type, Value, Sequence)

Mode and number of proofs:

shrink_sequence(@callable, @term, -list(term)) - zero_or_one

edge_case/2

Table of type edge cases. Fails if the given type have no defined edge cases. New edge cases for existing or new types can be added by defining a clause for this multifile predicate.

Compilation flags:

static, multifile

Template:

edge_case(Type,Term)

Mode and number of proofs:

edge_case(?callable,?term) - zero_or_more

get_seed/1

Gets the current random generator seed. Seed should be regarded as an opaque ground term.

Compilation flags:

static

Template:

get_seed(Seed)

Mode and number of proofs:

get_seed(-ground) - one

set_seed/1

Sets the random generator seed to a given value returned by calling the get_seed/1 predicate.

Compilation flags:

static

Template:

set_seed(Seed)

Mode and number of proofs:

set_seed(+ground) - one

`max_size/1`

User defined maximum size for types where its meaningful and implicit. When not defined, defaults to 42. When multiple definitions exist, the first valid one found is used.

Compilation flags:
 `static, multifile`

Template:
 `max_size(Size)`
Mode and number of proofs:
 `max_size(?positive_integer) - zero_or_one`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`type`

1.2 assertions

object

1.2.1 assertions

Proxy object for simplifying the use of the assertion meta-predicates.

Availability:

```
logtalk_load(assertions(loader))
```

Author: Paulo Moura

Version: 2:0:0

Date: 2014-04-03

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public assertions(_)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
assertion/1 assertion/2 goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.2.2 assertions(Mode)

A simple assertions framework. Can be used as a hook object for either suppressing assertions (production mode) or expanding them with file context information (debug mode).

Availability:

```
logtalk_load(assertions(loader))
```

Author: Paulo Moura

Version: 2:2:2

Date: 2022-07-04

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Uses:

```
logtalk
```

Remarks:

(none)

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
 - assertion/1

- assertion/2
- Protected predicates
- Private predicates
- Operators

Public predicates

assertion/1

Checks that an assertion is true. Uses the structured message printing mechanism for printing the results using a silent message for assertion success and a error message for assertion failure.

Compilation flags:
static

Template:
assertion(Goal)

Meta-predicate template:
assertion(0)

Mode and number of proofs:
assertion(@callable) - one

assertion/2

Checks that an assertion is true. Uses the structured message printing mechanism for printing the results using a silent message for assertion success and a error message for assertion failure. The context argument can be used to e.g. pass location data.

Compilation flags:
static

Template:
assertion(Context,Goal)

Meta-predicate template:
assertion(*,0)

Mode and number of proofs:
assertion(@term,@callable) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.2.3 assertions_messages

Assertions framework default message translations.

Availability:

```
logtalk_load(assertions(loader))
```

Author: Paulo Moura

Version: 2:2:0

Date: 2018-02-20

Compilation flags:

```
static
```

Provides:

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)

- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.3 assignvars

object

1.3.1 assignvars

Assignable variables (supporting backtracable assignment of non-variable terms).

Availability:

```
logtalk_load(assignvars(loader))
```

Author: Nobukuni Kino and Paulo Moura

Version: 1:7:0

Date: 2018-07-11

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public assignvarsp
```

Remarks:

(none)

Inherited public predicates:

(<=)/2 (=>)/2 assignable/1 assignable/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.3.2 assignvarsp

Assignable variables (supporting backtracable assignment of non-variable terms) protocol.

Availability:

logtalk_load(assignvars(loader))

Author: Nobukuni Kino and Paulo Moura

Version: 1:0:1

Date: 2019-06-10

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - assignable/1
 - assignable/2
 - (\leq)/2
 - (\geq)/2
- Protected predicates
- Private predicates
- Operators
 - op(100,xfx, \leq)
 - op(100,xfx, \geq)

Public predicates

assignable/1

Makes Variable an assignable variable. Initial state will be empty.

Compilation flags:

static

Template:

assignable(Variable)

Mode and number of proofs:

assignable(--assignvar) - one

Exceptions:

Variable is not a variable:

type_error(variable,Variable)

assignable/2

Makes Variable an assignable variable and sets its initial state to Value.

Compilation flags:

static

Template:

assignable(Variable, Value)

Mode and number of proofs:

assignable(--assignvar, @nonvar) - one

Exceptions:

Variable is not a variable:

type_error(variable, Variable)

Value is not instantiated:

in instantiation_error

(<=)/2

Sets the state of the assignable variable Variable to Value (initializing the variable if needed).

Compilation flags:

static

Template:

Variable<=Value

Mode and number of proofs:

(?assignvar)<=(@nonvar) - one

Exceptions:

Value is not instantiated:

in instantiation_error

$(=>)/2$

Unifies Value with the current state of the assignable variable Variable.

Compilation flags:

static

Template:

Variable=>Value

Mode and number of proofs:

+assignvar=> ?nonvar - zero_or_one

Exceptions:

Variable is not instantiated:

instantiation_error

Protected predicates

(none)

Private predicates

(none)

Operators

op(100,xfx,<=)

Scope:

public

op(100,xfx,=>)

Scope:

public

See also:

assignvars

1.4 base64

object

1.4.1 base64

Base64 parser and generator.

Availability:

```
logtalk_load(base64(loader))
```

Author: Paulo Moura

Version: 0:10:0

Date: 2021-03-22

Compilation flags:

```
static, context_switching_calls
```

Uses:

```
reader
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - parse/2
 - generate/2
- Protected predicates
- Private predicates
- Operators

Public predicates

parse/2

Parses the Base64 data from the given source (`atom(Atom)`, `chars(List)`, `codes(List)`, `stream(Stream)`, or `file(Path)`) into a list of bytes.

Compilation flags:

`static`

Template:

`parse(Source,Bytes)`

Mode and number of proofs:

`parse(++compound,--list(byte)) - one_or_error`

generate/2

Generates Base64 in the representation specified in the first argument (`atom(Atom)`, `chars(List)`, `codes(List)`, `stream(Stream)`, or `file(Path)`) for the list of bytes in the second argument.

Compilation flags:

`static`

Template:

`generate(Sink,Bytes)`

Mode and number of proofs:

`generate(+compound,+list(byte)) - one_or_error`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.4.2 base64url

Base64URL parser and generator.

Availability:

`logtalk_load(base64(loader))`

Author: Paulo Moura

Version: 0:9:0

Date: 2021-03-10

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - `parse/2`
 - `generate/2`
- Protected predicates
- Private predicates
- Operators

Public predicates

parse/2

Parses the Base64URL data from the given source (`atom(Atom)`, `chars(List)`, or `codes(List)`) into a URL (using the same format as the source).

Compilation flags:

static

Template:

`parse(Source,URL)`

Mode and number of proofs:

`parse(++compound,--types([atom,chars,codes])) - one_or_error`

generate/2

Generates Base64URL data in the representation specified in the first argument (`atom(Atom)`, `chars(List)`, or `codes(List)`) for the given URL (given in the same format as the sink).

Compilation flags:

static

Template:

`generate(Sink,URL)`

Mode and number of proofs:

`generate(+compound,+types([atom,chars,codes])) - one_or_error`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.5 cbor

object

1.5.1 cbor

Concise Binary Object Representation (CBOR) format exporter and importer. Uses atoms to represent decoded CBOR strings.

Availability:

```
logtalk_load(cbor(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2021-03-04

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public cbor(atom)
```

Remarks:

(none)

Inherited public predicates:

```
generate/2 parse/2
```

- Public predicates
- Protected predicates
- Private predicates

- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.5.2 cbor(StringRepresentation)

- StringRepresentation - Text representation to be used when decoding CBOR strings. Possible values are atom (default), chars, and codes.

Concise Binary Object Representation (CBOR) format exporter and importer.

Availability:

```
logtalk_load(cbor(loader))
```

Author: Paulo Moura

Version: 0:11:1

Date: 2021-12-06

Compilation flags:

```
static, context_switching_calls
```

Uses:

```
list
```

Remarks:

```
(none)
```

Inherited public predicates:

(none)

- Public predicates
 - parse/2
 - generate/2
- Protected predicates
- Private predicates
- Operators

Public predicates

parse/2

Parses a list of bytes in the CBOR format returning the corresponding term representation. Throws an error when parsing is not possible (usually due to an invalid byte sequence).

Compilation flags:

static

Template:

parse(Bytes,Term)

Mode and number of proofs:

parse(@list(byte),-ground) - one_or_error

generate/2

Generates a list of bytes in the CBOR format representing the given term. Throws an error when generating is not possible (usually due to a term that have no CBOR corresponding representation).

Compilation flags:

static

Template:

generate(Term,Bytes)

Mode and number of proofs:

generate(@ground,-list(byte)) - one_or_error

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.6 code_metrics

object

1.6.1 cc_metric

Cyclomatic complexity metric. All defined predicates that are not called or updated are counted as graph connected components (the reasoning being that these predicates can be considered entry points). The score is represented by a non-negative integer.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:5:2

Date: 2024-05-15

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities  
public code_metric
```

Provides:

```
logtalk::message_tokens//2
```

Uses:

```
list  
logtalk
```

numberlist

Remarks:

(none)

Inherited public predicates:

all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
 directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
 format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.6.2 code_metric

Core predicates for computing source code metrics.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Ebrahim Azarisooreh and Paulo Moura

Version: 0:12:1

Date: 2024-05-08

Compilation flags:

```
static
```

Extends:

```
public code_metrics_utilities
```

```
public options
```

Uses:

```
list
```

```
logtalk
```

```
os
```

```
type
```

Remarks:

```
(none)
```

Inherited public predicates:

```
check_option/1 check_options/1 default_option/1 default_options/1 option/2 option/3  
valid_option/1 valid_options/1
```

- Public predicates

- entity/1

- file/2

- file/1

- directory/2

- directory/1

- rdirectory/2

- rdirectory/1

- library/2

- library/1
- rlibrary/2
- rlibrary/1
- all/1
- all/0
- entity_score/2
- library_score/2
- rlibrary_score/2
- file_score/2
- directory_score/2
- rdirectory_score/2
- all_score/1
- format_entity_score//2
- Protected predicates
 - process_entity/2
 - process_file/2
 - process_directory/2
 - process_rdirectory/2
 - process_library/2
 - process_rlibrary/2
 - process_all/1
 - sub_directory/2
 - sub_library/2
- Private predicates
- Operators

Public predicates

entity/1

Scans an entity and prints its metric score.

Compilation flags:

static

Template:

entity(Entity)

Mode and number of proofs:

entity(+term) - zero_or_one

file/2

Prints metric scores for all the entities defined in a loaded source file using the given options.

Compilation flags:

static

Template:

file(File,Options)

Mode and number of proofs:

file(+atom,+list(compound)) - zero_or_one

file/1

Prints metric scores for all the entities defined in a loaded source file using default options.

Compilation flags:

static

Template:

file(File)

Mode and number of proofs:

file(+atom) - zero_or_one

directory/2

Scans a directory and prints metric scores for all entities defined in its loaded source files using the given options.

Compilation flags:

static

Template:

directory(Directory,Options)

Mode and number of proofs:

directory(+atom,+list(compound)) - one

directory/1

Scans a directory and prints metric scores for all entities defined in its loaded source files using default options.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

rdirectory/2

Recursive version of the directory/1 predicate using the given options.

Compilation flags:

static

Template:

rdirectory(Directory,Options)

Mode and number of proofs:

rdirectory(+atom,+list(compound)) - one

rdirectory/1

Recursive version of the directory/1 predicate using default options.

Compilation flags:

static

Template:

rdirectory(Directory)

Mode and number of proofs:

rdirectory(+atom) - one

library/2

Prints metrics scores for all loaded entities from a given library using the given options.

Compilation flags:

static

Template:

library(Library,Options)

Mode and number of proofs:

library(+atom,+list(compound)) - one

library/1

Prints metrics scores for all loaded entities from a given library using default options.

Compilation flags:

static

Template:

library(Library)

Mode and number of proofs:

library(+atom) - one

rlibrary/2

Recursive version of the library/1 predicate using the given options.

Compilation flags:

static

Template:

rlibrary(Library,Options)

Mode and number of proofs:

rlibrary(+atom,+list(compound)) - one

rlibrary/1

Recursive version of the library/1 predicate using default options.

Compilation flags:

static

Template:

rlibrary(Library)

Mode and number of proofs:

rlibrary(+atom) - one

all/1

Scans all loaded entities and prints their metric scores using the given options.

Compilation flags:

static

Template:

all(Options)

Mode and number of proofs:

all(+list(compound)) - one

all/0

Scans all loaded entities and prints their metric scores using default options.

Compilation flags:

static

Mode and number of proofs:

all - one

entity_score/2

Score is a term that represents the metric score associated with a loaded entity. Fails if the metric does not apply.

Compilation flags:

static

Template:

entity_score(Entity,Score)

Mode and number of proofs:

entity_score(@entity_identifier,-ground) - zero_or_one

library_score/2

Score is a term that represents the metric score associated with a loaded library source files. Fails if the metric does not apply.

Compilation flags:

static

Template:

library_score(Library,Score)

Mode and number of proofs:

library_score(@atom,-ground) - zero_or_one

rlibrary_score/2

Score is a term that represents the metric score associated with loaded source files from a library and its sub-libraries. Fails if the metric does not apply.

Compilation flags:

static

Template:

rlibrary_score(Library,Score)

Mode and number of proofs:

rlibrary_score(@atom,-ground) - zero_or_one

file_score/2

Score is a term that represents the metric score associated with a loaded source file. Fails if the metric does not apply.

Compilation flags:

static

Template:

file_score(File,Score)

Mode and number of proofs:

file_score(@atom,-ground) - zero_or_one

directory_score/2

Score is a term that represents the metric score associated with loaded source files from a directory. Fails if the metric does not apply.

Compilation flags:

static

Template:

directory_score(Directory,Score)

Mode and number of proofs:

directory_score(@atom,-ground) - zero_or_one

rdirectory_score/2

Score is a term that represents the metric score associated with loaded source files from a directory and its sub-directories. Fails if the metric does not apply.

Compilation flags:

static

Template:

rdirectory_score(Directory,Score)

Mode and number of proofs:

rdirectory_score(@atom,-ground) - zero_or_one

all_score/1

Score is a term that represents the metric score associated with all loaded source files. Fails if the metric does not apply.

Compilation flags:

static

Template:

all_score(Score)

Mode and number of proofs:

all_score(-ground) - zero_or_one

`format_entity_score//2`

Formats the entity score for pretty printing.

Compilation flags:

`static`

Template:

`format_entity_score(Entity,Score)`

Mode and number of proofs:

`format_entity_score(@entity_identifier,+ground) - one`

Protected predicates

`process_entity/2`

Processes an entity of the given kind.

Compilation flags:

`static`

Template:

`process_entity(Kind,Entity)`

Mode and number of proofs:

`process_entity(+atom,@entity_identifier) - one`

`process_file/2`

Processes a source file using the given options.

Compilation flags:

`static`

Template:

`process_file(Path,Options)`

Mode and number of proofs:

`process_file(+atom,+list(compound)) - one`

`process_directory/2`

Processes a directory of source files using the given options.

Compilation flags:

`static`

Template:

`process_directory(Path,Options)`

Mode and number of proofs:

`process_directory(+atom,+list(compound)) - one`

`process_rdirectory/2`

Recursively process a directory of source files using the given options.

Compilation flags:

`static`

Template:

`process_rdirectory(Path,Options)`

Mode and number of proofs:

`process_rdirectory(+atom,+list(compound)) - one`

`process_library/2`

Processes a library of source files using the given options.

Compilation flags:

`static`

Template:

`process_library(Library,Options)`

Mode and number of proofs:

`process_library(+atom,+list(compound)) - one`

`process_rlibrary/2`

Recursively process a library of source files using the given options.

Compilation flags:

`static`

Template:

`process_rlibrary(Library,Options)`

Mode and number of proofs:

`process_rlibrary(+atom,+list(compound)) - one`

`process_all/1`

Processes all loaded source code using the given options.

Compilation flags:

`static`

Template:

`process_all(Options)`

Mode and number of proofs:

`process_all(+list(compound)) - one`

`sub_directory/2`

Enumerates, by backtracking, all directory sub-directories containing loaded files.

Compilation flags:

`static`

Template:

sub_directory(Directory,SubDirectory)

Mode and number of proofs:

sub_directory(+atom,-atom) - one

sub_library/2

Enumerates, by backtracking, all library sub-libraries.

Compilation flags:

static

Template:

sub_library(Library,SubLibrary)

Mode and number of proofs:

sub_library(+atom,-atom) - one

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.3 code_metrics

Helper object to apply all loaded code metrics.

Availability:

logtalk_load(code_metrics(loader))

Author: Ebrahim Azarisooreh and Paulo Moura

Version: 0:1:0

Date: 2017-12-31

Compilation flags:

static, context_switching_calls

Imports:

public code_metric

Uses:

logtalk

Remarks:

(none)

Inherited public predicates:

all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
 directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
 format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.6.4 code_metrics_messages

Message translations for the code_metrics tool.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Ebrahim Azarisooreh and Paulo Moura

Version: 0:8:0

Date: 2022-05-05

Compilation flags:

```
static
```

Provides:

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.6.5 code_metrics_utilities

Internal predicates for analyzing source code.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Ebrahim Azarisooreh

Version: 0:7:0

Date: 2024-03-28

Compilation flags:

```
static
```

Uses:

```
list
```

```
logtalk
```

Remarks:

- Usage: This is meant to be imported by any metric added to the system.
- Predicate Scope: This is meant for internal use by metrics only. As such, all provided predicates are protected.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
 - ancestor/4
 - current_entity/1
 - declares_predicate/2
 - defines_predicate/2
 - defines_predicate/3
 - entity_calls/3
 - entity_kind/2
 - entity_property/2
 - entity_updates/3
 - not_excluded_file/3
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

ancestor/4

True if Entity descends from Ancestor, and EntityKind and AncestorKind unify with their respective entity types.

Compilation flags:

static

Template:

ancestor(EntityKind,Entity,AncestorKind,Ancestor)

Mode and number of proofs:

ancestor(?entity,?entity_identifier,?entity,?entity_identifier) - zero_or_more

current_entity/1

True if Entity is a currently loaded entity.

Compilation flags:

static

Template:

current_entity(Entity)

Mode and number of proofs:

current_entity(?entity_identifier) - zero_or_more

declares_predicate/2

True if Entity declares Predicate internally.

Compilation flags:

static

Template:

declares_predicate(Entity,Predicate)

Mode and number of proofs:

declares_predicate(?entity_identifier,?predicate_indicator) - zero_or_more

defines_predicate/2

True if Entity defines an implementation of Predicate internally. Auxiliary predicates are excluded from results.

Compilation flags:

static

Template:

defines_predicate(Entity,Predicate)

Mode and number of proofs:

defines_predicate(?entity_identifier,?predicate_indicator) - zero_or_more

`defines_predicate/3`

Same as `defines_predicate/2`, except `Property` is unified with a property of the predicate.

Compilation flags:

`static`

Template:

`defines_predicate(Entity,Predicate,Property)`

Mode and number of proofs:

`defines_predicate(?entity_identifier,?predicate_indicator,?term) - zero_or_more`

`entity_calls/3`

True if a predicate `Caller` within `Entity` makes a `Call`.

Compilation flags:

`static`

Template:

`entity_calls(Entity,Caller,Call)`

Mode and number of proofs:

`entity_calls(?entity_identifier,?predicate_indicator,?predicate_indicator) - zero_or_one`

`entity_kind/2`

True if `Kind` defines `Entity` and is one of `category`, `protocol`, or `object`.

Compilation flags:

`static`

Template:

`entity_kind(Entity,Kind)`

Mode and number of proofs:

entity_kind(+entity_identifier,-entity) - zero_or_one

entity_property/2

True if Property is a valid property of Entity. Entity can be either a category, a protocol, or an object.

Compilation flags:

static

Template:

entity_property(Entity,Property)

Mode and number of proofs:

entity_property(+entity_identifier,-term) - zero_or_more

entity_updates/3

True if a predicate Updater within Entity makes a dynamic update to Updated (by using e.g. the asserta/1 or retract/1 predicates).

Compilation flags:

static

Template:

entity_updates(Entity,Updater,Updated)

Mode and number of proofs:

entity_updates(+entity_identifier,?predicate_indicator,?predicate_indicator) - zero_or_one

not_excluded_file/3

True if the file is not being excluded.

Compilation flags:

static

Template:

```
not_excluded_file(ExcludedFiles,Path,Basename)
```

Mode and number of proofs:

```
not_excluded_file(+list(atom),+atom,+atom) - zero_or_one
```

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.6 coupling_metric

Computes entity efferent coupling, afferent coupling, and instability.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Ebrahim Azarisooreh and Paulo Moura

Version: 0:14:0

Date: 2024-03-27

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities  
public code_metric
```

Uses:

```
list
```

Remarks:

- Efferent coupling (Ce): Number of entities that an entity depends on.
- Afferent coupling (Ca): Number of entities that depend on an entity.

- Instability (I): Computed as $Ce / (Ce + Ca)$. Measures the entity resilience to change. Ranging from 0 to 1, with 0 indicating a maximally stable entity and 1 indicating a maximally unstable entity. Ideally, an entity is either maximally stable or maximally unstable.
- Abstractness (A): Computed as the ratio between the number of static predicates with scope directives without a local definition and the number of static predicates with scope directives. Measures the rigidity of an entity. Ranging from 0 to 1, with 0 indicating a fully concrete entity and 1 indicating a fully abstract entity.
- Entity score: Represented as the compound term `ce_ca_i_a(Ce,Ca,I,A)`.
- Dependencies count: Includes direct entity relations plus calls or dynamic updates to predicates in external objects or categories.

Inherited public predicates:

```
all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.7 dit_metric

Analyzes the depth of inheritance for objects, protocols, and categories.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Ebrahim Azarisooreh

Version: 0:6:1

Date: 2024-03-28

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities
```

```
public code_metric
```

Uses:

```
numberlist
```

Remarks:

- Depth: The depth is the maximum length of a node to the root entity. Lower scores are generally better.
- Inheritance: A level of inheritance defined by either one of specialization, instantiation, extension, importation, or implementation.
- Scoring: The maximum path length is determined for each entity in question.

Inherited public predicates:

```
all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1  
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2  
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1  
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1  
valid_options/1
```

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.8 doc_metric

Entity and entity predicates documentation score.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:13:0

Date: 2022-05-05

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities
```

```
public code_metric
```

Uses:

```
list
```

numberlist

Remarks:

- Score range: Score is a integer percentage where a 100% score means that all expected documentation information is present.
- Score weights: The score is split by default between 20% for the entity documentation and 80% for the entity predicates documentation, Can be customized using the predicate `entity_predicates_weights_hook/2`.
- Score customization: The individual scores of entity info/1 pairs and predicate info/2 pairs can be customized using the `entity_info_pair_score_hook/3` and `predicate_info_pair_score_hook/4` predicates.

Inherited public predicates:

`all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1 directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2 format_entity_score/2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1 rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1 valid_options/1`

- Public predicates
 - `entity_predicates_weights_hook/2`
 - `entity_info_score_hook/2`
 - `entity_info_pair_score_hook/3`
 - `predicate_mode_score_hook/3`
 - `predicate_mode_score_hook/5`
 - `predicate_info_score_hook/3`
 - `predicate_info_pair_score_hook/4`
- Protected predicates
- Private predicates
- Operators

Public predicates

`entity_predicates_weights_hook/2`

Relative weight between entity documentation and predicates documentation in percentage. The sum of the two values must be equal to 100.

Compilation flags:

`dynamic, multifile`

Template:

entity_predicates_weights_hook(EntityWeight,PredicatesWeight)

Mode and number of proofs:

entity_predicates_weights_hook(?integer,?integer) - zero_or_one

entity_info_score_hook/2

Maximum score for entity info/1 directives.

Compilation flags:

dynamic, multifile

Template:

entity_info_score_hook(Entity,MaximumScore)

Mode and number of proofs:

entity_info_score_hook(?term,?integer) - zero_or_one

entity_info_pair_score_hook/3

Score for relevant entity info/1 directive pairs. If defined, the entity_info_score_hook/2 predicate should be defined accordingly.

Compilation flags:

dynamic, multifile

Template:

entity_info_pair_score_hook(Pair,Entity,Score)

Mode and number of proofs:

entity_info_pair_score_hook(?callable,?term,?integer) - zero_or_more

predicate_mode_score_hook/3

Maximum score for predicate mode/2 directives.

Compilation flags:

dynamic, multifile

Template:

predicate_mode_score_hook(Entity,Predicate,MaximumScore)

Mode and number of proofs:

predicate_mode_score_hook(?term,?term,?integer) - zero_or_more

predicate_mode_score_hook/5

Score for a predicate mode/2 directive. If defined, the predicate_mode_score_hook/3 predicate should be defined accordingly.

Compilation flags:

dynamic, multifile

Template:

predicate_mode_score_hook(Template,Solutions,Entity,Predicate,Score)

Mode and number of proofs:

predicate_mode_score_hook(?term,?term,?term,?term,?integer) - zero_or_one

predicate_info_score_hook/3

Maximum score for predicate info/2 directives.

Compilation flags:

dynamic, multifile

Template:

predicate_info_score_hook(Entity,Predicate,MaximumScore)

Mode and number of proofs:

predicate_info_score_hook(?term,?term,?integer) - zero_or_one

predicate_info_pair_score_hook/4

Score for a predicate info/2 directive pairs. If defined, the predicate_info_score_hook/3 predicate should be defined accordingly.

Compilation flags:
dynamic, multifile

Template:
predicate_info_pair_score_hook(Pair,Entity,Predicate,Score)
Mode and number of proofs:
predicate_info_pair_score_hook(?callable,?term,?term,?integer) - zero_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)
object

1.6.9 halstead_metric

Computes Halstead complexity numbers for an entity using a Stroud of 18.

Availability:
logtalk_load(code_metrics(loader))

Author: Paulo Moura
Version: 1:0:0
Date: 2018-06-08

Compilation flags:

static, context_switching_calls

Extends:

public halstead_metric(18)

Remarks:

(none)

Inherited public predicates:

all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.10 `halstead_metric`(Stroud)

- Stroud - Coefficient for computing the time required to program.

Computes Halstead complexity numbers for an entity.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:9:0

Date: 2024-03-27

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities
public code_metric
```

Uses:

```
list
numberlist
pairs
```

Remarks:

- Definition of operators: Predicates declared, user-defined, and called are interpreted as operators. Built-in predicates and built-in control constructs are ignored.
- Definition of operands: Predicate arguments are abstracted and interpreted as operands. Note that this definition of operands is a significant deviation from the original definition, which used syntactic literals.
- P_n : Number of distinct predicates (declared, defined, called, or updated).
- PAn : Number of predicate arguments (assumed distinct).
- C_n : Number of predicate calls/updates + number of clauses.
- CAn : Number of predicate call/update arguments + number of clause head arguments.
- EV: Entity vocabulary: $EV = P_n + PAn$.
- EL: Entity length: $EL = C_n + CAn$.
- V: Volume: $V = EL * \log_2(EV)$.
- D: Difficulty: $D = (P_n/2) * (CAn/An)$.
- E: Effort: $E = D * V$.
- T: Time required to program: $T = E/k$ seconds (k is the Stroud number; defaults to 18).

- B: Number of delivered bugs: $B = V/3000$.
- Entity score: Represented as the compound term `pn_pan_cn_can_ev_el_v_d_e_t_b/11`.

Inherited public predicates:

`all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.11 `noc_metric`

Number of entity clauses metric. The score is represented using the compound term `number_of_clauses(Total, User)`.

Availability:

`logtalk_load(code_metrics(loader))`

Author: Ebrahim Azarisooreh and Paulo Moura

Version: 0:14:1
Date: 2024-05-08

Compilation flags:
static, context_switching_calls

Imports:
public code_metrics_utilities
public code_metric

Provides:
logtalk::message_tokens//2

Uses:
list
logtalk

Remarks:
(none)

Inherited public predicates:
all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.12 `nor_metric`

Number of entity rules metric. The score is represented using the compound term `number_of_rules(Total, User)`.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:5:1

Date: 2024-05-08

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities
```

```
public code_metric
```

Provides:

```
logtalk::message_tokens//2
```

Uses:

```
list
```

```
logtalk
```

Remarks:

```
(none)
```


Inherited public predicates:

all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
 directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
 format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.13 size_metric

Source code size metric. Returned scores are upper bounds and based solely in source file sizes (expressed in bytes).

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:7:1

Date: 2024-05-08

Compilation flags:

static, context_switching_calls

Imports:

public code_metrics_utilities
public code_metric

Provides:

logtalk::message_tokens//2

Uses:

list
logtalk
numberlist
os

Remarks:

(none)

Inherited public predicates:

all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.6.14 upn_metric

Number of unique predicates nodes metric. The nodes include called and updated predicates independently of where they are defined. The score is represented by a non-negative integer.

Availability:

```
logtalk_load(code_metrics(loader))
```

Author: Paulo Moura

Version: 0:6:2

Date: 2024-05-15

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public code_metrics_utilities
```

```
public code_metric
```

Provides:

```
logtalk::message_tokens//2
```

Uses:

```
list
```

```
logtalk
```

```
numberlist
```

Remarks:

(none)

Inherited public predicates:

```
all/0 all/1 all_score/1 check_option/1 check_options/1 default_option/1 default_options/1
directory/1 directory/2 directory_score/2 entity/1 entity_score/2 file/1 file/2 file_score/2
format_entity_score//2 library/1 library/2 library_score/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory_score/2 rlibrary/1 rlibrary/2 rlibrary_score/2 valid_option/1
valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.7 core

category

1.7.1 core_messages

Logtalk core (compiler and runtime) default message tokenization.

Availability:

`built_in`

Author: Paulo Moura

Version: 1:142:0

Date: 2024-11-12

Compilation flags:

`static`

Provides:

logtalk::message_prefix_stream/4
logtalk::message_tokens//2

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.7.2 expanding

Term and goal expansion protocol.

Availability:

built_in

Author: Paulo Moura

Version: 1:1:0

Date: 2016-07-12

Compilation flags:
static, built_in

Dependencies:
(none)

Remarks:
(none)

Inherited public predicates:
(none)

- Public predicates
 - goal_expansion/2
 - term_expansion/2
- Protected predicates
- Private predicates
- Operators

Public predicates

goal_expansion/2

Defines a goal expansion. Called recursively until a fixed point is reached on goals found while compiling a source file (except for goals wrapped using the `{}/1` compiler bypass control construct).

Compilation flags:
static

Template:
goal_expansion(Goal,ExpandedGoal)
Mode and number of proofs:
goal_expansion(+callable,-callable) - zero_or_one

term_expansion/2

Defines a term expansion. Called until it succeeds on all terms read while compiling a source file (except for terms skipped by using the conditional compilation directives or wrapped using the `{}/1` compiler bypass control construct).

Compilation flags:

static

Template:

term_expansion(Term,ExpandedTerms)

Mode and number of proofs:

term_expansion(+term,-term) - zero_or_one

term_expansion(+term,-list(term)) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

protocol

1.7.3 forwarding

Message forwarding protocol.

Availability:

built_in

Author: Paulo Moura

Version: 1:0:0

Date: 2013-05-04

Compilation flags:

static, built_in

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - forward/1
- Protected predicates
- Private predicates
- Operators

Public predicates

forward/1

User-defined message forwarding handler, automatically called (if defined) by the runtime for any message that the receiving object does not understand.

Compilation flags:

static

Template:

forward(Message)

Mode and number of proofs:

forward(@callable) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.7.4 logtalk

Built-in object providing message printing, debugging, library, source file, and hacking methods.

Availability:

`built_in`

Author: Paulo Moura

Version: 3:0:0

Date: 2024-12-13

Compilation flags:

`static, built_in, context_switching_calls, threaded`

Dependencies:

(none)

Remarks:

- Default message kinds: `silent`, `silent(Key)`, `banner`, `help`, `comment`, `comment(Key)`, `information`, `information(Key)`, `warning`, `warning(Key)`, `error`, `error(Key)`, `debug`, `debug(Key)`, `question`, and `question(Key)`.
- Printing of silent messages: By default, silent messages are not printed. These messages are only useful when intercepted.
- Printing of banner and comment messages: By default, banner and comment messages are only printed when the report flag is turned on.
- Printing of help, information, and question messages: These messages are always printed by default as they provide requested output.
- Printing of warning messages: By default, warning messages are not printed when the report flag is turned off.

- Printing of error messages: These messages are always printed by default.
- Printing of debug messages: By default, debug messages are only printed when the debug flag is turned on. The compiler suppresses debug message printing goals when compiling in optimized mode.
- Meta messages: A meta message is a message that have another message as argument and is typically used for debugging messages. Meta messages avoid the need of defining tokenizer rules for every message but can be intercepted as any other message.
- Meta message @Message: By default, the message is printed as passed to the write/1 predicate followed by a newline.
- Meta message Key-Value: By default, the message is printed as “Key: Value” followed by a newline. The key is printed as passed to the write/1 predicate while the value is printed as passed to the writeq/1 predicate.
- Meta message Format+Arguments: By default, the message is printed as passed to the format/2 predicate.
- Meta message List: By default, the list items are printed indented one per line. The items are preceded by a dash and can be @Message, Key-Value, or Format+Arguments messages. If that is not the case, the item is printed as passed to the writeq/1 predicate.
- Meta message Title::List: By default, the title is printed followed by a newline and the indented list items, one per line. The items are printed as in the List meta message.
- Meta message [Stream,Prefix]>>Goal: By default, call user-defined Goal in the context of user. The use of a lambda expression allows passing the message stream and prefix. Printing the prefix is delegated to the goal.
- Meta message [Stream]>>Goal: By default, call user-defined Goal in the context of user. The use of a lambda expression allows passing the message stream.
- Message tokens: at_same_line, tab(Expression), nl, flush, Format-Arguments, term(Term,Options), ansi(Attributes,Format,Arguments), begin(Kind,Variable), and end(Variable).

Inherited public predicates:

(none)

- Public predicates
 - print_message/3
 - print_message_tokens/3
 - print_message_token/4
 - message_tokens//2
 - message_prefix_stream/4
 - message_prefix_file/6
 - message_hook/4
 - ask_question/5
 - question_hook/6
 - question_prompt_stream/4

- trace_event/2
- debug_handler/1
- active_debug_handler/1
- activate_debug_handler/1
- deactivate_debug_handler/0
- debug_handler/3
- expand_library_path/2
- loaded_file/1
- loaded_file_property/2
- file_type_extension/2
- compile_aux_clauses/1
- entity_prefix/2
- compile_predicate_heads/4
- compile_predicate_indicators/3
- decompile_predicate_heads/4
- decompile_predicate_indicators/4
- execution_context/7
- Protected predicates
- Private predicates
 - active_debug_handler_/1
- Operators

Public predicates

print_message/3

Prints a message of the given kind for the specified component.

Compilation flags:

static

Template:

print_message(Kind,Component,Message)

Mode and number of proofs:

print_message(+nonvar,+nonvar,+nonvar) - one

`print_message_tokens/3`

Print the messages tokens to the given stream, prefixing each line with the specified atom.

Compilation flags:

`static`

Template:

`print_message_tokens(Stream,Prefix,Tokens)`

Mode and number of proofs:

`print_message_tokens(@stream_or_alias,+atom,@list(nonvar)) - one`

`print_message_token/4`

User-defined hook predicate for printing a message token (see this object remarks).

Compilation flags:

`dynamic, multifile`

Template:

`print_message_token(Stream,Prefix,Token,Tokens)`

Mode and number of proofs:

`print_message_token(@stream_or_alias,@atom,@nonvar,@list(nonvar)) - zero_or_one`

`message_tokens//2`

User-defined hook grammar rule for converting a message into a list of tokens (see this object remarks).

Compilation flags:

`dynamic, multifile`

Template:

`message_tokens(Message,Component)`

Mode and number of proofs:

`message_tokens(+nonvar,+nonvar) - zero_or_one`

`message_prefix_stream/4`

Message line prefix and output stream to be used when printing a message given its kind and component.

Compilation flags:

dynamic, multifile

Template:

`message_prefix_stream(Kind,Component,Prefix,Stream)`

Mode and number of proofs:

`message_prefix_stream(?nonvar,?nonvar,?atom,?stream_or_alias) - zero_or_more`

`message_prefix_file/6`

Message line prefix and output file to be used when printing a message given its kind and component.

Compilation flags:

dynamic, multifile

Template:

`message_prefix_file(Kind,Component,Prefix,File,Mode,Options)`

Mode and number of proofs:

`message_prefix_file(?nonvar,?nonvar,?atom,?atom,?atom,?list(compound)) - zero_or_more`

`message_hook/4`

User-defined hook predicate for intercepting message printing calls.

Compilation flags:

dynamic, multifile

Template:

`message_hook(Message,Kind,Component,Tokens)`

Mode and number of proofs:

`message_hook(+nonvar,+nonvar,+nonvar,+list(nonvar)) - zero_or_one`

`ask_question/5`

Asks a question and reads the answer until the check predicate is true.

Compilation flags:

`static`

Template:

`ask_question(Kind,Component,Question,Check,Answer)`

Meta-predicate template:

`ask_question(*,*,*,1,*)`

Mode and number of proofs:

`ask_question(+nonvar,+nonvar,+nonvar,+callable,-term) - one`

`question_hook/6`

User-defined hook predicate for intercepting question asking calls.

Compilation flags:

`dynamic, multifile`

Template:

`question_hook(Question,Kind,Component,Tokens,Check,Answer)`

Meta-predicate template:

`question_hook(*,*,*,*,1,*)`

Mode and number of proofs:

`question_hook(+nonvar,+nonvar,+nonvar,+list(nonvar),+callable,-term) - zero_or_one`

`question_prompt_stream/4`

Prompt and input stream to be used when asking a question given its kind and component.

Compilation flags:

`dynamic, multifile`

Template:

`question_prompt_stream(Kind,Component,Prompt,Stream)`

Mode and number of proofs:

`question_prompt_stream(?nonvar,?nonvar,?atom,?stream_or_alias) - zero_or_more`

`trace_event/2`

Trace event handler. The runtime calls all trace event handlers using a failure-driven loop before calling the debug event handler.

Compilation flags:

`dynamic, multifile`

Template:

`trace_event(Event,ExecutionContext)`

Mode and number of proofs:

`trace_event(@callable,@execution_context) - zero`

Remarks:

- Unification events: Generated after a successful unification with a fact - `fact(Entity,Fact,Clause,File,Line)` - or a rule head - `rule(Entity,Head,Clause,File,Line)`.
 - Goal events: Generated when calling a goal: `top_goal(Goal,CompiledGoal)` or `goal(Goal,CompiledGoal)`.
-

`debug_handler/1`

Enumerates, by backtracking, all declared debug handler providers. Define a clause for this predicate to declare a new debug handler provider.

Compilation flags:

`static, multifile`

Template:

`debug_handler(Provider)`

Mode and number of proofs:

`debug_handler(?object_identifier) - zero_or_more`

`debug_handler(?category_identifier) - zero_or_more`

active_debug_handler/1

Current active debug handler provider if any. There is at most one active debug handler provider at any given moment.

Compilation flags:

static

Template:

active_debug_handler(Provider)

Mode and number of proofs:

active_debug_handler(?category_identifier) - zero_or_one

active_debug_handler(?category_identifier) - zero_or_one

activate_debug_handler/1

Activates the given debug handler provider. There is at most one active debug handler provider at any given moment. Fails if the object or category is not declared as a debug handler provider.

Compilation flags:

static

Template:

activate_debug_handler(Provider)

Mode and number of proofs:

activate_debug_handler(@object_identifier) - zero_or_one

activate_debug_handler(@category_identifier) - zero_or_one

deactivate_debug_handler/0

Deactivates the current debug handler provider if any.

Compilation flags:

static

Mode and number of proofs:

deactivate_debug_handler - one

debug_handler/3

Debug event handler. Called by the runtime when the given provider is active.

Compilation flags:
static, multifile

Template:
debug_handler(Provider,Event,ExecutionContext)

Mode and number of proofs:
debug_handler(+object_identifier,+callable,+execution_context) - zero_or_more
debug_handler(+category_identifier,+callable,+execution_context) - zero_or_more

Remarks:

- Unification events: Generated after a successful unification with a fact - fact(Entity,Fact,Clause,File,Line) - or a rule head - rule(Entity,Head,Clause,File,Line).
 - Goal events: Generated when calling a goal: top_goal(Goal,CompiledGoal) or goal(Goal,CompiledGoal).
-

expand_library_path/2

Expands a library alias or a library path into its absolute path. Uses a depth bound to prevent loops.

Compilation flags:
static

Template:
expand_library_path(LibraryPath,AbsolutePath)

Mode and number of proofs:
expand_library_path(+atom,?atom) - zero_or_one
expand_library_path(+callable,?atom) - zero_or_one

loaded_file/1

Enumerates, by backtracking, all loaded files, returning their full paths.

Compilation flags:

static

Template:

loaded_file(Path)

Mode and number of proofs:

loaded_file(?atom) - zero_or_more

loaded_file_property/2

Enumerates, by backtracking, loaded file properties.

Compilation flags:

static

Template:

loaded_file_property(Path,Property)

Mode and number of proofs:

loaded_file_property(?atom,?compound) - zero_or_more

Remarks:

- Property basename/1: Basename of the file (includes the file extension, if any).
- Property directory/1: Directory of the file (ending with a slash).
- Property mode/1: Compilation mode of the file (possible values are optimal, normal, and debug).
- Property flags/1: Explicit flags used for compiling the file.
- Property text_properties/1: List of the file text properties (encoding/1 and bom/1). Empty if no encoding/1 directive is present and the stream used for reading the file does not have a bom/1 (or equivalent) property.
- Property target/1: Full path of the generated intermediate Prolog file.
- Property modified/1: File modification time stamp (should be regarded as an opaque but otherwise comparable term).
- Property parent/1: Full path of the parent file that loaded the file.
- Property includes/1: Full path of a file included by the file.

- Property library/1: Library alias for the library that includes the file.
 - Property object/1: Identifier for an object defined in the file.
 - Property protocol/1: Identifier for a protocol defined in the file.
 - Property category/1: Identifier for a category defined in the file.
-

file_type_extension/2

Enumerates, by backtracking, all defined file type extensions. The defined types are: source, object, logtalk, prolog, and tmp. The source type returns both logtalk and prolog type extensions.

Compilation flags:

static

Template:

file_type_extension(Type,Extension)

Mode and number of proofs:

file_type_extension(?atom,?atom) - zero_or_more

compile_aux_clauses/1

Compiles a list of auxiliary clauses. Can only be called during source file compilation, usually from term_expansion/2 or goal_expansion/2 hook predicate definitions.

Compilation flags:

static

Template:

compile_aux_clauses(Clauses)

Mode and number of proofs:

compile_aux_clauses(@list(clause)) - one

`entity_prefix/2`

Converts between an entity identifier and the entity prefix that is used for its compiled code. When none of the arguments is instantiated, it returns the identifier and the prefix of the entity under compilation, if any.

Compilation flags:

`static`

Template:

`entity_prefix(Entity,Prefix)`

Mode and number of proofs:

`entity_prefix(?entity_identifier,?atom) - zero_or_one`

`compile_predicate_heads/4`

Compiles clause heads. The heads are compiled in the context of the entity under compilation when the entity argument is not instantiated.

Compilation flags:

`static`

Template:

`compile_predicate_heads(Heads,Entity,CompiledHeads,ExecutionContext)`

Mode and number of proofs:

`compile_predicate_heads(@list(callable),?entity_identifier,-list(callable),@execution_context) - zero_or_one`

`compile_predicate_heads(@conjunction(callable),?entity_identifier,-conjunction(callable),@execution_context) - zero_or_one`

`compile_predicate_heads(@callable,?entity_identifier,-callable,@execution_context) - zero_or_one`

`compile_predicate_indicators/3`

Compiles predicate indicators. The predicate are compiled in the context of the entity under compilation when the entity argument is not instantiated.

Compilation flags:

`static`

Template:

```
compile_predicate_indicators(PredicateIndicators,Entity,CompiledPredicateIndicators)
```

Mode and number of proofs:

```
compile_predicate_indicators(@list(predicate_indicator),?entity_identifier,
-list(predicate_indicator)) - zero_or_one
compile_predicate_indicators(@conjunction(predicate_indicator),?entity_identifier,
-conjunction(predicate_indicator)) - zero_or_one
compile_predicate_indicators(@predicate_indicator,?entity_identifier,-predicate_indicator) -
zero_or_one
```

decompile_predicate_heads/4

Decompiles clause heads. All compiled clause heads must belong to the same entity, which must be loaded.

Compilation flags:

```
static
```

Template:

```
decompile_predicate_heads(CompiledHeads,Entity,Type,Heads)
```

Mode and number of proofs:

```
decompile_predicate_heads(@list(callable),-entity_identifier,-atom,-list(callable)) - zero_or_one
decompile_predicate_heads(@conjunction(callable),-entity_identifier,-atom,-conjunction(callable)) -
zero_or_one
decompile_predicate_heads(@callable,-entity_identifier,-atom,-callable) - zero_or_one
```

decompile_predicate_indicators/4

Decompiles predicate indicators. All compiled predicate indicators must belong to the same entity, which must be loaded.

Compilation flags:

```
static
```

Template:

```
decompile_predicate_indicators(CompiledPredicateIndicators,Entity,Type,PredicateIndicators)
```

Mode and number of proofs:

```
decompile_predicate_indicators(@list(predicate_indicator),-entity_identifier,-atom,
-list(predicate_indicator)) - zero_or_one
```

```
decompile_predicate_indicators(@conjunction(predicate_indicator),-entity_identifier,-atom,  
-conjunction(predicate_indicator)) - zero_or_one  
decompile_predicate_indicators(@predicate_indicator,-entity_identifier,-atom,-predicate_indicator)  
- zero_or_one
```

execution_context/7

Execution context term data. Execution context terms should be considered opaque terms subject to change without notice.

Compilation flags:

static

Template:

```
execution_context(ExecutionContext,Entity,Sender,This,Self,MetaCallContext,CoinductionStack)
```

Mode and number of proofs:

```
execution_context(?nonvar,?entity_identifier,?object_identifier,?object_identifier,?object_identifier,  
@list(callable),@list(callable)) - zero_or_one
```

Protected predicates

(none)

Private predicates

active_debug_handler_/1

Current active debug handler provider. There is at most one active debug handler provider at any given moment.

Compilation flags:

dynamic

Template:

```
active_debug_handler_(Provider)
```

Mode and number of proofs:

```
active_debug_handler_(?entity_identifier) - zero_or_one
```

Operators

(none)

protocol

1.7.5 monitoring

Event handlers protocol. The handlers are automatically called by the runtime for messages sent using the `::/2` control construct from objects or categories compiled with the events flag set to allow.

Availability:

built_in

Author: Paulo Moura

Version: 1:2:0

Date: 2018-11-29

Compilation flags:

static, built_in

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - before/3
 - after/3
- Protected predicates
- Private predicates
- Operators

Public predicates

before/3

Event handler for before events. A before event handler may prevent a method from being looked up or called by failing.

Compilation flags:

static

Template:

before(Object,Message,Sender)

Mode and number of proofs:

before(?term,?term,?term) - zero_or_more

after/3

Event handler for after events. An after event handler may prevent a method from succeeding by failing.

Compilation flags:

static

Template:

after(Object,Message,Sender)

Mode and number of proofs:

after(?term,?term,?term) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.7.6 user

Pseudo-object representing the plain Prolog database. Can be used as a monitor by defining `before/3` and `after/3` predicates. Can be used as a hook object by defining `term_expansion/2` and `goal_expansion/2` multifile and dynamic predicates.

Availability:

`built_in`

Author: Paulo Moura

Version: 1:6:0

Date: 2024-11-11

Compilation flags:

`static`, `built_in`, `context_switching_calls`, `dynamic_declarations`, `threaded`

Implements:

`public expanding`

`public forwarding`

`public monitoring`

Uses:

`user`

Remarks:

(none)

Inherited public predicates:

`after/3` `before/3` `forward/1` `goal_expansion/2` `term_expansion/2`

- `Public predicates`
- `Protected predicates`
- `Private predicates`

- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.8 coroutining

object

1.8.1 coroutining

Coroutining predicates.

Availability:

`logtalk_load(coroutining(loader))`

Author: Paulo Moura

Version: 0:5:0

Date: 2021-12-17

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

- Supported backend Prolog systems: ECLiPSe, XVM, SICStus Prolog, SWI-Prolog, Trealla Prolog, and YAP.

Inherited public predicates:

(none)

- Public predicates
 - dif/2
 - dif/1
 - freeze/2
 - frozen/2
 - when/2
- Protected predicates
- Private predicates
- Operators

Public predicates

dif/2

Sets a constraint that is true iff the two terms are different.

Compilation flags:

static

Template:

dif(Term1,Term2)

Mode and number of proofs:

dif(+term,+term) - zero_or_one

dif/1

Sets a set of constraints that are true iff all terms in a list are different.

Compilation flags:

static

Template:

dif(Terms)

Mode and number of proofs:

dif(+list(term)) - zero_or_one

freeze/2

Delays the execution of a goal until a variable is bound.

Compilation flags:

static

Template:

freeze(Variable,Goal)

Meta-predicate template:

freeze(*,0)

Mode and number of proofs:

freeze(+term,+callable) - zero_or_more

frozen/2

Unifies Goal with the goal delayed by Variable. When no goals are frozen on Variable, Goal is unified with true.

Compilation flags:

static

Template:

frozen(Variable,Goal)

Mode and number of proofs:

frozen(@var,--callable) - one

when/2

Calls Goal when Condition becomes true. The portable conditions are: nonvar/1, ground/1, (,)/2, and (;)/2.

Compilation flags:

static

Template:

when(Condition,Goal)

Meta-predicate template:

when(*,0)

Mode and number of proofs:

when(+callable,+callable) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.9 csv

object

1.9.1 csv

CSV files reading and writing predicates using the options Header - keep, Separator - comma, and Ignore-Quotes - false.

Availability:

```
logtalk_load(csv(loader))
```

Author: Jacinto Dávila

Version: 1:0:0

Date: 2021-02-02

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public csv(keep,comma,false)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
guess_arity/2 guess_separator/2 read_file/2 read_file/3 read_file_by_line/2  
read_file_by_line/3 read_stream/2 read_stream/3 read_stream_by_line/2  
read_stream_by_line/3 write_file/3 write_stream/3
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.9.2 csv(Header,Separator,IgnoreQuotes)

- Header - Header handling option with possible values missing, skip, and keep (default).
- Separator - Separator handling option with possible values comma (default for non .tsv and non .tab files or when no file name extension is available), tab (default for .tsv and .tab files), semicolon, and colon.
- IgnoreQuotes - Double-quotes handling option to ignore (true) or preserve (false; default) double quotes surrounding data.

CSV file and stream reading and writing predicates.

Availability:

```
logtalk_load(csv(loader))
```

Author: Jacinto Dávila and Paulo Moura

Version: 2:1:0

Date: 2023-11-15

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public csv_protocol
```

Uses:

```
list
logtalk
os
reader
type
```

Remarks:

(none)

Inherited public predicates:

guess_arity/2 guess_separator/2 read_file/2 read_file/3 read_file_by_line/2
read_file_by_line/3 read_stream/2 read_stream/3 read_stream_by_line/2
read_stream_by_line/3 write_file/3 write_stream/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.9.3 csv_guess_questions

Support for asking questions when guessing the separator and the record arity of CSV files.

Availability:

logtalk_load(csv(loader))

Author: Jacinto Dávila

Version: 1:0:0

Date: 2021-02-03

Compilation flags:

static

Provides:

logtalk::message_tokens//2

logtalk::question_prompt_stream/4

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.9.4 csv_protocol

CSV file and stream reading and writing protocol.

Availability:

```
logtalk_load(csv(loader))
```

Author: Jacinto Dávila and Paulo Moura

Version: 2:0:0

Date: 2023-03-13

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- Type-checking: Some of the predicate file and stream argument type-checking exceptions depend on the Prolog backend compliance with standards.

Inherited public predicates:

```
(none)
```

- Public predicates
 - read_file/3
 - read_stream/3
 - read_file/2
 - read_stream/2
 - read_file_by_line/3
 - read_stream_by_line/3
 - read_file_by_line/2
 - read_stream_by_line/2
 - write_file/3
 - write_stream/3
 - guess_separator/2
 - guess_arity/2

- Protected predicates
- Private predicates
- Operators

Public predicates

`read_file/3`

Reads a CSV file saving the data as clauses for the specified object predicate. Fails if the file cannot be parsed.

Compilation flags:

`static`

Template:

`read_file(File, Object, Predicate)`

Mode and number of proofs:

`read_file(+atom, +object_identifier, +predicate_indicator) - zero_or_one`

Exceptions:

File is a variable:

`instantiation_error`

File is neither a variable nor an atom:

`type_error(atom, File)`

File is an atom but not an existing file:

`existence_error(file, File)`

File is an existing file but cannot be opened for reading:

`permission_error(open, source_sink, File)`

Object is a variable:

`instantiation_error`

Object is neither a variable nor an object identifier:

`type_error(object_identifier, Object)`

Object is a valid object identifier but not an existing object:

`existence_error(object, Object)`

Predicate is a variable:

`instantiation_error`

Predicate is neither a variable nor a predicate indicator:

`type_error(predicate_indicator, Predicate)`

Predicate is a valid predicate indicator but not an existing public predicate:

`existence_error(predicate, Predicate)`

read_stream/3

Reads a CSV stream saving the data as clauses for the specified object predicate. Fails if the stream cannot be parsed.

Compilation flags:

static

Template:

read_stream(Stream, Object, Predicate)

Mode and number of proofs:

read_stream(+stream_or_alias, +object_identifier, +predicate_indicator) - zero_or_one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias, Stream)

Stream is not an open stream:

existence_error(stream, Stream)

Stream is an output stream:

permission_error(input, stream, Stream)

Stream is a binary stream:

permission_error(input, binary_stream, Stream)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier, Object)

Object is a valid object identifier but not an existing object:

existence_error(object, Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator, Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate, Predicate)

read_file/2

Reads a CSV file returning the data as a list of rows, each row a list of fields. Fails if the file cannot be parsed.

Compilation flags:

static

Template:

read_file(File,Rows)

Mode and number of proofs:

read_file(+atom,-list(list)) - zero_or_one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)

File is an existing file but cannot be opened for reading:

permission_error(open,source_sink,File)

read_stream/2

Reads a CSV stream returning the data as a list of rows, each row a list of fields. Fails if the stream cannot be parsed.

Compilation flags:

static

Template:

read_stream(Stream,Rows)

Mode and number of proofs:

read_stream(+stream_or_alias,-list(list)) - zero_or_one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias,Stream)
Stream is not an open stream:
existence_error(stream,Stream)
Stream is an output stream:
permission_error(input,stream,Stream)
Stream is a binary stream:
permission_error(input,binary_stream,Stream)

read_file_by_line/3

Reads a CSV file saving the data as clauses for the specified object predicate. The file is read line by line. Fails if the file cannot be parsed.

Compilation flags:
static

Template:
read_file_by_line(File,Object,Predicate)
Mode and number of proofs:
read_file_by_line(+atom,+object_identifier,+predicate_indicator) - zero_or_one

Exceptions:

- File is a variable:
instantiation_error
- File is neither a variable nor an atom:
type_error(atom,File)
- File is an atom but not an existing file:
existence_error(file,File)
- File is an existing file but cannot be opened for reading:
permission_error(open,source_sink,File)
- Object is a variable:
instantiation_error
- Object is neither a variable nor an object identifier:
type_error(object_identifier,Object)
- Object is a valid object identifier but not an existing object:
existence_error(object,Object)
- Predicate is a variable:
instantiation_error
- Predicate is neither a variable nor a predicate indicator:
type_error(predicate_indicator,Predicate)
- Predicate is a valid predicate indicator but not an existing public predicate:
existence_error(predicate,Predicate)

`read_stream_by_line/3`

Reads a CSV stream saving the data as clauses for the specified object predicate. The stream is read line by line. Fails if the stream cannot be parsed.

Compilation flags:

`static`

Template:

`read_stream_by_line(Stream, Object, Predicate)`

Mode and number of proofs:

`read_stream_by_line(+stream_or_alias, +object_identifier, +predicate_indicator) - zero_or_one`

Exceptions:

Stream is a variable:

`instantiation_error`

Stream is neither a variable nor a stream-term or alias:

`domain_error(stream_or_alias, Stream)`

Stream is not an open stream:

`existence_error(stream, Stream)`

Stream is an output stream:

`permission_error(input, stream, Stream)`

Stream is a binary stream:

`permission_error(input, binary_stream, Stream)`

Object is a variable:

`instantiation_error`

Object is neither a variable nor an object identifier:

`type_error(object_identifier, Object)`

Object is a valid object identifier but not an existing object:

`existence_error(object, Object)`

Predicate is a variable:

`instantiation_error`

Predicate is neither a variable nor a predicate indicator:

`type_error(predicate_indicator, Predicate)`

Predicate is a valid predicate indicator but not an existing public predicate:

`existence_error(predicate, Predicate)`

`read_file_by_line/2`

Reads a CSV file returning the data as a list of rows, each row a list of fields. The file is read line by line. Fails if the file cannot be parsed.

Compilation flags:

`static`

Template:

`read_file_by_line(File,Rows)`

Mode and number of proofs:

`read_file_by_line(+atom,-list(list)) - zero_or_one`

Exceptions:

File is a variable:

`instantiation_error`

File is neither a variable nor an atom:

`type_error(atom,File)`

File is an atom but not an existing file:

`existence_error(file,File)`

File is an existing file but cannot be opened for reading:

`permission_error(open,source_sink,File)`

`read_stream_by_line/2`

Reads a CSV stream returning the data as a list of rows, each row a list of fields. The stream is read line by line. Fails if the stream cannot be parsed.

Compilation flags:

`static`

Template:

`read_stream_by_line(Stream,Rows)`

Mode and number of proofs:

`read_stream_by_line(+stream_or_alias,-list(list)) - zero_or_one`

Exceptions:

Stream is a variable:

`instantiation_error`

Stream is neither a variable nor a stream-term or alias:

```

    domain_error(stream_or_alias,Stream)
Stream is not an open stream:
    existence_error(stream,Stream)
Stream is an output stream:
    permission_error(input,stream,Stream)
Stream is a binary stream:
    permission_error(input,binary_stream,Stream)

```

write_file/3

Writes a CSV file with the data represented by the clauses of the specified object predicate.

Compilation flags:

```
static
```

Template:

```
write_file(File,Object,Predicate)
```

Mode and number of proofs:

```
write_file(+atom,+object_identifier,+predicate_indicator) - one
```

Exceptions:

File is a variable:

```
instantiation_error
```

File is neither a variable nor an atom:

```
type_error(atom,File)
```

File is an atom but cannot be opened for writing:

```
permission_error(open,source_sink,File)
```

Object is a variable:

```
instantiation_error
```

Object is neither a variable nor an object identifier:

```
type_error(object_identifier,Object)
```

Object is a valid object identifier but not an existing object:

```
existence_error(object,Object)
```

Predicate is a variable:

```
instantiation_error
```

Predicate is neither a variable nor a predicate indicator:

```
type_error(predicate_indicator,Predicate)
```

Predicate is a valid predicate indicator but not an existing public predicate:

```
existence_error(predicate,Predicate)
```

write_stream/3

Writes a CSV stream with the data represented by the clauses of the specified object predicate.

Compilation flags:

static

Template:

write_stream(Stream, Object, Predicate)

Mode and number of proofs:

write_stream(+stream_or_alias, +object_identifier, +predicate_indicator) - one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias, Stream)

Stream is not an open stream:

existence_error(stream, Stream)

Stream is an input stream:

permission_error(output, stream, Stream)

Stream is a binary stream:

permission_error(output, binary_stream, Stream)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier, Object)

Object is a valid object identifier but not an existing object:

existence_error(object, Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator, Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate, Predicate)

guess_separator/2

Guesses the separator used in a given file, asking the user to confirm.

Compilation flags:

static

Template:

guess_separator(File,Separator)

Mode and number of proofs:

guess_separator(+atom,-atom) - one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)

File is an atom but cannot be opened for writing:

permission_error(open,source_sink,File)

guess_arity/2

Guesses the arity of records in a given file, asking the user to confirm.

Compilation flags:

static

Template:

guess_arity(File,Arity)

Mode and number of proofs:

guess_arity(+atom,-number) - one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)
File is an atom but cannot be opened for writing:
permission_error(open,source_sink,File)

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.10 dates

object

1.10.1 date

Date predicates.

Availability:

logtalk_load(dates(loader))

Author: Paulo Moura

Version: 1:2:0

Date: 2014-09-27

Compilation flags:

static, context_switching_calls

Implements:

public datep

Uses:

os

Remarks:

(none)

Inherited public predicates:

days_in_month/3 leap_year/1 name_of_day/3 name_of_month/3 today/3 valid/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.10.2 datep

Date protocol.

Availability:

logtalk_load(dates(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2005-03-17

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - today/3
 - leap_year/1
 - name_of_day/3
 - name_of_month/3
 - days_in_month/3
 - valid/3
- Protected predicates
- Private predicates
- Operators

Public predicates

today/3

Returns current date.

Compilation flags:

static

Template:

today(Year,Month,Day)

Mode and number of proofs:

today(-integer,-integer,-integer) - one

leap_year/1

True if the argument is a leap year.

Compilation flags:

static

Template:

leap_year(Year)

Mode and number of proofs:

leap_year(+integer) - zero_or_one

name_of_day/3

Name and short name of day.

Compilation flags:

static

Template:

name_of_day(Index,Name,Short)

Mode and number of proofs:

name_of_day(?integer,?atom,?atom) - zero_or_more

name_of_month/3

Name and short name of month.

Compilation flags:

static

Template:

name_of_month(Index,Name,Short)

Mode and number of proofs:

name_of_month(?integer,?atom,?atom) - zero_or_more

days_in_month/3

Number of days in a month.

Compilation flags:

static

Template:

days_in_month(Month,Year,Days)

Mode and number of proofs:

days_in_month(?integer,+integer,?integer) - zero_or_more

valid/3

True if the arguments represent a valid date.

Compilation flags:

static

Template:

valid(Year,Month,Day)

Mode and number of proofs:

valid(@integer,@integer,@integer) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

date, timep

object

1.10.3 time

Time predicates.

Availability:

logtalk_load(dates(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2014-09-27

Compilation flags:

static, context_switching_calls

Implements:

public timep

Uses:

os

Remarks:

(none)

Inherited public predicates:

cpu_time/1 now/3 valid/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[datep](#)

[protocol](#)

1.10.4 timep

Time protocol.

Availability:

`logtalk_load(dates(loader))`

Author: Paulo Moura

Version: 1:0:0

Date: 2000-07-24

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - now/3
 - cpu_time/1
 - valid/3
- Protected predicates
- Private predicates
- Operators

Public predicates

now/3

Returns current time.

Compilation flags:

static

Template:

now(Hours,Mins,Secs)

Mode and number of proofs:

now(-integer,-integer,-integer) - one

cpu_time/1

Returns the current cpu time.

Compilation flags:

static

Template:

cpu_time(Time)

Mode and number of proofs:

cpu_time(-number) - one

valid/3

True if the arguments represent a valid time value.

Compilation flags:

static

Template:

valid(Hours,Mins,Secs)

Mode and number of proofs:

valid(+integer,+integer,+integer) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

time, datep

1.11 dead_code_scanner

object

1.11.1 dead_code_scanner

A tool for detecting likely dead code in compiled Logtalk entities and Prolog modules compiled as objects.

Availability:

logtalk_load(dead_code_scanner(loader))

Author: Barry Evans and Paulo Moura

Version: 0:15:2

Date: 2024-10-21

Compilation flags:

static, context_switching_calls

Imports:

public options

Uses:

list

logtalk

os

type

Remarks:

- Dead code: A predicate or non-terminal that is not called (directly or indirectly) by any scoped predicate or non-terminal. These predicates and non-terminals are not used, cannot be called without breaking encapsulation, and are thus considered dead code.
- Known issues: Use of local meta-calls with goal arguments only known at runtime can result in false positives. Calls from non-standard meta-predicates may be missed if the meta-calls are not optimized.
- Requirements: Source files must be compiled with the source_data flag turned on. To avoid false positives due to meta-calls, compilation of source files with the optimized flag turned on is also advised.

Inherited public predicates:

check_option/1 check_options/1 default_option/1 default_options/1 option/2 option/3
valid_option/1 valid_options/1

- Public predicates
 - entity/1
 - file/2
 - file/1
 - directory/2
 - directory/1
 - rdirectory/2
 - rdirectory/1
 - library/2
 - library/1
 - rlibrary/2
 - rlibrary/1

- all/1
- all/0
- predicates/2
- predicate/2
- Protected predicates
- Private predicates
- Operators

Public predicates

entity/1

Scans a loaded entity for dead code. Fails if the entity does not exist.

Compilation flags:

static

Template:

entity(Entity)

Mode and number of proofs:

entity(+entity_identifier) - zero_or_one

file/2

Scans all entities in a loaded source file for dead code using the given options. The file can be given by name, basename, full path, or using library notation. Fails if the file is not loaded.

Compilation flags:

static

Template:

file(File,Options)

Mode and number of proofs:

file(+atom,+list(compound)) - zero_or_one

file/1

Scans all entities in a loaded source file for dead code using default options. The file can be given by name, basename, full path, or using library notation. Fails if the file is not loaded.

Compilation flags:

static

Template:

file(File)

Mode and number of proofs:

file(+atom) - zero_or_one

directory/2

Scans all entities in all loaded files from a given directory for dead code using the given options.

Compilation flags:

static

Template:

directory(Directory,Options)

Mode and number of proofs:

directory(+atom,+list(compound)) - one

directory/1

Scans all entities in all loaded files from a given directory for dead code using default options.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

rdirectory/2

Scans all entities in all loaded files from a given directory and its sub-directories for dead code using the given options.

Compilation flags:

static

Template:

rdirectory(Directory,Options)

Mode and number of proofs:

rdirectory(+atom,+list(compound)) - one

rdirectory/1

Scans all entities in all loaded files from a given directory and its sub-directories for dead code using default options.

Compilation flags:

static

Template:

rdirectory(Directory)

Mode and number of proofs:

rdirectory(+atom) - one

library/2

Scans all entities in all loaded files from a given library for dead code using the given options.

Compilation flags:

static

Template:

library(Library,Options)

Mode and number of proofs:

library(+atom,+list(compound)) - one

library/1

Scans all entities in all loaded files from a given library for dead code using default options.

Compilation flags:

static

Template:

library(Library)

Mode and number of proofs:

library(+atom) - one

rlibrary/2

Scans all entities in all loaded files in a loaded library and its sub-libraries for dead code using the given options.

Compilation flags:

static

Template:

rlibrary(Library,Options)

Mode and number of proofs:

rlibrary(+atom,+list(compound)) - one

rlibrary/1

Scans all entities in all loaded files in a loaded library and its sub-libraries for dead code using default options.

Compilation flags:

static

Template:

rlibrary(Library)

Mode and number of proofs:

rlibrary(+atom) - one

all/1

Scans all entities for dead code using the given options.

Compilation flags:

static

Template:

all(Options)

Mode and number of proofs:

all(+list(compound)) - one

all/0

Scans all entities for dead code using default options.

Compilation flags:

static

Mode and number of proofs:

all - one

predicates/2

Returns an ordered set of local predicates (and non-terminals) that are not used, directly or indirectly, by scoped predicates for a loaded entity.

Compilation flags:

static

Template:

predicates(Entity,Predicates)

Mode and number of proofs:

predicates(+entity_identifier,-list(predicate_indicator)) - one

predicate/2

Enumerates, by backtracking, local predicates (and non-terminals) that are not used, directly or indirectly, by scoped predicates for a loaded entity.

Compilation flags:

static

Template:

predicate(Entity,Predicate)

Mode and number of proofs:

predicate(+entity_identifier,?predicate_indicator) - zero_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.11.2 dead_code_scanner_messages

Logtalk dead_code_scanner tool default message translations.

Availability:

```
logtalk_load(dead_code_scanner(loader))
```

Author: Barry Evans and Paulo Moura

Version: 0:8:0

Date: 2024-05-07

Compilation flags:

```
static
```

Provides:

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.12 debug_messages

object

1.12.1 debug_messages

Supports selective enabling and disabling of debug and debug(Group) messages.

Availability:

```
logtalk_load(debug_messages(loader))
```

Author: Paulo Moura

Version: 1:0:1

Date: 2022-05-05

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::message_hook/4
```

Uses:

```
logtalk
```

Remarks:

- Limitations: Debug messages are suppressed by the compiler when the optimize flag is turned on and thus cannot be enabled in this case.

Inherited public predicates:

(none)

- Public predicates
 - enable/1
 - disable/1
 - enabled/1
 - enable/2
 - disable/2
 - enabled/2
- Protected predicates
- Private predicates
 - enabled_/1
 - enabled_/2
- Operators

Public predicates

enable/1

Enables all debug and debug(Group) messages for the given component.

Compilation flags:

static

Template:

enable(Component)

Mode and number of proofs:

enable(@term) - one

disable/1

Disables all debug and debug(Group) messages for the given component.

Compilation flags:

static

Template:

disable(Component)

Mode and number of proofs:

disable(@term) - one

enabled/1

Enumerates by backtracking the components with enabled debug and debug(Group) messages.

Compilation flags:

static

Template:

enabled(Component)

Mode and number of proofs:

enabled(?term) - zero_or_more

enable/2

Enables debug(Group) messages for the given component and group.

Compilation flags:

static

Template:

enable(Component,Group)

Mode and number of proofs:

enable(@term,@term) - one

disable/2

Disables debug(Group) messages for the given component and group.

Compilation flags:

static

Template:

disable(Component,Group)

Mode and number of proofs:

disable(@term,@term) - one

enabled/2

Enumerates by backtracking the enabled debug(Group) messages for each component.

Compilation flags:

static

Template:

enabled(Component,Group)

Mode and number of proofs:

enabled(?term,?term) - zero_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

enabled_/1

Table of components with currently enabled debug and debug(Group) messages.

Compilation flags:

dynamic

Template:

enabled_(Component)

Mode and number of proofs:

enabled_(?term) - zero_or_more

enabled_/2

Table of currently enabled debug(Group) per component.

Compilation flags:

dynamic

Template:

enabled_(Component,Group)

Mode and number of proofs:

enabled_(?term,?term) - zero_or_more

Operators

(none)

1.13 debugger

object

1.13.1 debugger

Command-line debugger based on an extended procedure box model supporting execution tracing and spy points.

Availability:

logtalk_load(debugger(loader))

Author: Paulo Moura

Version: 7:9:1

Date: 2024-11-03

Compilation flags:

static, context_switching_calls

Implements:

public debuggerp

Provides:

logtalk::debug_handler/1

logtalk::debug_handler/3

Uses:

logtalk

Remarks:

(none)

Inherited public predicates:

debug/0 debugging/0 debugging/1 leash/1 leashing/1 log/3 logging/3 nodebug/0 nolog/3
nologall/0 nospy/1 nospy/3 nospy/4 nospyall/0 notrace/0 reset/0 spy/1 spy/3 spy/4 spying/1
spying/3 spying/4 trace/0

- Public predicates
- Protected predicates
- Private predicates
 - debugging_/0
 - tracing_/0
 - skipping_/0
 - skipping_unleashed_/1
 - quasi_skipping_/0
 - leaping_/1
 - breakpoint_/2
 - spying_predicate_/3
 - spying_context_/4
 - leashing_/1
 - invocation_number_/1
 - jump_to_invocation_number_/1
 - zap_to_port_/1
 - write_max_depth_/1
 - log_point_/3
 - conditional_breakpoint_/3

- triggered_breakpoint_/4
- triggered_breakpoint_enabled_/2
- file_line_hit_count_/3
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

debugging_/0

True iff debug is on.

Compilation flags:

dynamic

Mode and number of proofs:

debugging_ - zero_or_one

tracing_/0

True iff tracing is on.

Compilation flags:

dynamic

Mode and number of proofs:

tracing_ - zero_or_one

skipping_/0

True iff skipping.

Compilation flags:

dynamic

Mode and number of proofs:

skipping_ - zero_or_one

skipping_unleashed_/1

True iff skipping (a goal with invocation number N) but showing intermediate ports as unleashed.

Compilation flags:

dynamic

Template:

skipping_unleashed_(N)

Mode and number of proofs:

skipping_unleashed_(?integer) - zero_or_one

quasi_skipping_/0

True iff quasi-skipping.

Compilation flags:

dynamic

Mode and number of proofs:

quasi_skipping_ - zero_or_one

leaping_/1

True iff leaping in tracing or debugging mode.

Compilation flags:

dynamic

Template:

leaping_(Mode)

Mode and number of proofs:

leaping_(?atom) - zero_or_one

breakpoint_/2

Table of unconditional breakpoints.

Compilation flags:

dynamic

Template:

breakpoint_(Entity,Line)

Mode and number of proofs:

breakpoint_(?object_identifier,?integer) - zero_or_more

breakpoint_(?category_identifier,?integer) - zero_or_more

spying_predicate_/3

Table of predicate spy points.

Compilation flags:

dynamic

Template:

spying_predicate_(Functor,Arity,Original)

Mode and number of proofs:

spying_predicate_(?atom,?integer,?predicate_indicator) - zero_or_more

spying_predicate_(?atom,?integer,?non_terminal_indicator) - zero_or_more

spying_context_/4

Table of context spy points.

Compilation flags:
dynamic

Template:
spying_context_(Sender,This,Self,Goal)

Mode and number of proofs:

spying_context_(?object_identifier,?object_identifier,?object_identifier,?callable) - zero_or_more

leashing_/1

Table of currently leashed ports.

Compilation flags:
dynamic

Template:
leashing_(Port)

Mode and number of proofs:

leashing_(?atom) - zero_or_more

invocation_number_/1

Current call stack invocation number.

Compilation flags:
dynamic

Template:
invocation_number_(N)

Mode and number of proofs:

invocation_number_(?integer) - zero_or_one

jump_to_invocation_number_/1

Invocation number to jump to.

Compilation flags:

dynamic

Template:

jump_to_invocation_number_(N)

Mode and number of proofs:

jump_to_invocation_number_(?integer) - zero_or_one

zap_to_port_/1

Port to zap to.

Compilation flags:

dynamic

Template:

zap_to_port_(Port)

Mode and number of proofs:

zap_to_port_(?integer) - zero_or_one

write_max_depth_/1

Current term maximum depth.

Compilation flags:

dynamic

Template:

write_max_depth_(MaxDepth)

Mode and number of proofs:

write_max_depth_(?integer) - zero_or_one

log_point_/3

Table of log points.

Compilation flags:

dynamic

Template:

log_point_(Entity,Line,Message)

Mode and number of proofs:

log_point_(?object_identifier,?integer,?atom) - zero_or_more

log_point_(?category_identifier,?integer,?atom) - zero_or_more

conditional_breakpoint_/3

Table of conditional breakpoints.

Compilation flags:

dynamic

Template:

conditional_breakpoint_(Entity,Line,Condition)

Mode and number of proofs:

conditional_breakpoint_(?object_identifier,?integer,?callable) - zero_or_more

conditional_breakpoint_(?category_identifier,?integer,?callable) - zero_or_more

triggered_breakpoint_/4

Table of defined triggered breakpoints.

Compilation flags:

dynamic

Template:

triggered_breakpoint_(Entity,Line,TriggerEntity,TriggerLine)

Mode and number of proofs:

triggered_breakpoint_(?object_identifier,?integer,?object_identifier,?integer) - zero_or_more

triggered_breakpoint_(?object_identifier,?integer,?category_identifier,?integer) - zero_or_more

triggered_breakpoint_(?category_identifier,?integer,?object_identifier,?integer) - zero_or_more

triggered_breakpoint_(?category_identifier,?integer,?category_identifier,?integer) - zero_or_more

triggered_breakpoint_enabled_/2

Table of enabled triggered breakpoints.

Compilation flags:

dynamic

Template:

triggered_breakpoint_enabled_(Entity,Line)

Mode and number of proofs:

triggered_breakpoint_enabled_(?object_identifier,?integer) - zero_or_more

triggered_breakpoint_enabled_(?category_identifier,?integer) - zero_or_more

file_line_hit_count_/3

Table of file and line hit counts (successful unifications with clause heads).

Compilation flags:

dynamic

Template:

file_line_hit_count_(File,Line,Count)

Mode and number of proofs:

`file_line_hit_count_(?atom,?integer,?integer) - zero_or_one`

Operators

(none)

category

1.13.2 debugger_messages

Logtalk debugger tool default message translations.

Availability:

`logtalk_load(debugger(loader))`

Author: Paulo Moura

Version: 3:7:1

Date: 2024-11-05

Compilation flags:

`static`

Provides:

`logtalk::message_prefix_stream/4`

`logtalk::question_prompt_stream/4`

`logtalk::message_tokens//2`

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.13.3 debuggerp

Debugger protocol.

Availability:

```
logtalk_load(debugger(loader))
```

Author: Paulo Moura

Version: 3:3:1

Date: 2024-11-02

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- Debugger help: Type the character h (condensed help) or the character ? (extended help) at a leashed port.
- Predicate breakpoint: Specified as a ground term Functor/Arity.
- Non-terminal breakpoint: Specified as a ground term Functor//Arity.
- Clause breakpoint: Specified as an Entity-Line term with both Entity and Line bound. Line must be the first source file line of an entity clause.

- Conditional breakpoint: Specified as an Entity-Line term with both Entity and Line bound and a condition. Line must be the first source file line of an entity clause.
- Hit count breakpoint: Specified as an Entity-Line term with both Entity and Line bound and an unification count expression as a condition. Line must be the first source file line of an entity clause.
- Triggered breakpoint: Specified as an Entity-Line term with both Entity and Line bound and another breakpoint as a condition. Line must be the first source file line of an entity clause.
- Context breakpoint: Specified as a (Sender, This, Self, Goal) tuple.
- Log point: Specified as an (Entity, Line, Message) tuple.
- Leash port shorthands: none - [], loose - [fact,rule,call], half - [fact,rule,call,redo], tight - [fact,rule,call,redo,fail,exception], and full - [fact,rule,call,exit,redo,fail,exception].

Inherited public predicates:

(none)

- Public predicates
 - reset/0
 - debug/0
 - nodebug/0
 - debugging/0
 - debugging/1
 - trace/0
 - notrace/0
 - leash/1
 - leashing/1
 - spy/1
 - spying/1
 - nospy/1
 - spy/3
 - spying/3
 - nospy/3
 - spy/4
 - spying/4
 - nospy/4
 - nospyall/0
 - log/3
 - logging/3
 - nolog/3

- nologall/0
- Protected predicates
- Private predicates
- Operators

Public predicates

reset/0

Resets all debugging settings (including breakpoints, log points, and leashed ports) and turns off debugging.

Compilation flags:

static

Mode and number of proofs:

reset - one

See also:

nospyall/0

debug/0

Starts debugging for all defined breakpoints.

Compilation flags:

static

Mode and number of proofs:

debug - one

nodebug/0

Stops debugging for all defined breakpoints. Also turns off tracing. Does not remove defined breakpoints.

Compilation flags:

static

Mode and number of proofs:

nodebug - one

See also:

reset/0

debugging/0

Reports current debugging settings, including breakpoints and log points.

Compilation flags:

static

Mode and number of proofs:

debugging - one

debugging/1

Enumerates, by backtracking, all entities compiled in debug mode.

Compilation flags:

static

Template:

debugging(Entity)

Mode and number of proofs:

debugging(?entity_identifier) - zero_or_more

trace/0

Starts tracing all calls compiled in debug mode.

Compilation flags:

static

Mode and number of proofs:

trace - one

notrace/0

Stops tracing of calls compiled in debug mode. Debugger will still stop at defined breakpoints.

Compilation flags:

static

Mode and number of proofs:

notrace - one

leash/1

Sets the debugger leash ports using an abbreviation (none, loose, half, tight, or full) or a list of ports (valid ports are fact, rule, call, exit, redo, fail, and exception).

Compilation flags:

static

Template:

leash(Ports)

Mode and number of proofs:

leash(+atom) - one

leash(+list(atom)) - one

leashing/1

Enumerates, by backtracking, all leashed ports (valid ports are fact, rule, call, exit, redo, fail, and exception).

Compilation flags:

static

Template:

leashing(Port)

Mode and number of proofs:

leashing(?atom) - zero_or_more

spy/1

Sets a predicate or clause breakpoint (removing any existing log point or breakpoint defined for the same location, or a list of breakpoints. Fails if a breakpoint is invalid.

Compilation flags:

static

Template:

spy(Breakpoint)

Mode and number of proofs:

spy(@spy_point) - zero_or_one

spy(@list(spy_point)) - zero_or_one

spying/1

Enumerates, by backtracking, all defined predicate and clause breakpoints.

Compilation flags:

static

Template:

spying(Breakpoint)

Mode and number of proofs:

spying(?spy_point) - zero_or_more

nospy/1

Removes all matching predicate and clause breakpoints.

Compilation flags:

static

Template:

nospy(Breakpoint)

Mode and number of proofs:

nospy(@var) - one

nospy(@spy_point) - one

nospy(@list(spy_point)) - one

spy/3

Sets a conditional or triggered breakpoint (removing any existing log point or breakpoint defined for the same location). The condition can be a unification count expression, a lambda expression, or another breakpoint. Fails if the breakpoint is invalid.

Compilation flags:

static

Template:

spy(Entity,Line,Condition)

Mode and number of proofs:

spy(+atom,+integer,@callable) - zero_or_one

Remarks:

- Unification count expression conditions: $>(Count)$, $\geq(Count)$, $:=(Count)$, $\leq(Count)$, $<(Count)$, $\text{mod}(M)$, and $Count$.
 - Lambda expression conditions: $[Count,N,Goal]>>Condition$ and $[Goal]>>Condition$ where $Count$ is the unification count, N is the invocation number, and $Goal$ is the goal that unified with the clause head; $Condition$ is called in the context of user.
 - Triggered breakpoint conditions: Entity-Line.
-

spying/3

Enumerates, by backtracking, all conditional and triggered breakpoints.

Compilation flags:

static

Template:

spying(Entity,Line,Condition)

Mode and number of proofs:

spying(?atom,?integer,?callable) - zero_or_more

nospy/3

Removes all matching conditional and triggered breakpoints.

Compilation flags:

static

Template:

nospy(Entity,Line,Condition)

Mode and number of proofs:

nospy(@term,@term,@term) - one

spy/4

Sets a context breakpoint.

Compilation flags:

static

Template:

spy(Sender,This,Self,Goal)

Mode and number of proofs:

spy(@term,@term,@term,@term) - one

spying/4

Enumerates, by backtracking, all defined context breakpoints.

Compilation flags:

static

Template:

spying(Sender,This,Self,Goal)

Mode and number of proofs:

spying(?term,?term,?term,?term) - zero_or_more

nospy/4

Removes all matching context breakpoints.

Compilation flags:

static

Template:

nospy(Sender,This,Self,Goal)

Mode and number of proofs:

nospy(@term,@term,@term,@term) - one

nospyall/0

Removes all breakpoints and log points.

Compilation flags:

static

Mode and number of proofs:

nospyall - one

See also:

[reset/0](#)

log/3

Sets a log point (removing any existing breakpoint defined for the same location). Fails if the log point is invalid.

Compilation flags:

static

Template:

log(Entity,Line,Message)

Mode and number of proofs:

log(@object_identifier,+integer,+atom) - zero_or_one

log(@category_identifier,+integer,+atom) - zero_or_one

logging/3

Enumerates, by backtracking, all defined log points.

Compilation flags:

static

Template:

logging(Entity,Line,Message)

Mode and number of proofs:

logging(?object_identifier,?integer,?atom) - zero_or_more

logging(?category_identifier,?integer,?atom) - zero_or_more

nolog/3

Removes all matching log points.

Compilation flags:

static

Template:

nolog(Entity,Line,Message)

Mode and number of proofs:

nolog(@var_or(object_identifier),@var_or(integer),@var_or(atom)) - one

nolog(@var_or(category_identifier),@var_or(integer),@var_or(atom)) - one

nologall/0

Removes all log points.

Compilation flags:

static

Mode and number of proofs:

nologall - one

See also:

[reset/0](#)

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[debugger](#)

[object](#)

1.13.4 dump_trace

Simple solution for redirecting a debugger trace to a file.

Availability:

```
logtalk_load(debugger(loader))
```

Author: Paulo Moura

Version: 1:0:1

Date: 2021-11-12

Compilation flags:

```
static, context_switching_calls
```

Uses:

```
debugger
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - start_redirect_to_file/2
 - stop_redirect_to_file/0
- Protected predicates
- Private predicates
- Operators

Public predicates

```
start_redirect_to_file/2
```

Starts redirecting debugger trace messages to a file.

Compilation flags:

```
static
```

Template:

```
start_redirect_to_file(File,Goal)
```

Meta-predicate template:

```
start_redirect_to_file(*,0)
```

Mode and number of proofs:

```
start_redirect_to_file(+atom,+callable) - zero_or_more
```

`stop_redirect_to_file/0`

Stops redirecting debugger trace messages to a file.

Compilation flags:

```
static
```

Mode and number of proofs:

```
stop_redirect_to_file - one
```

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.14 dependents

category

1.14.1 observer

Smalltalk dependent protocol.

Availability:

`logtalk_load(dependents(loader))`

Author: Paulo Moura

Version: 1:0:0

Date: 2003-02-09

Compilation flags:

`static`

Dependencies:

`(none)`

Remarks:

`(none)`

Inherited public predicates:

`(none)`

- Public predicates
 - `update/1`
- Protected predicates
- Private predicates
- Operators

Public predicates

`update/1`

Called when an observed object is updated.

Compilation flags:

`static`

Template:

update(Change)

Mode and number of proofs:

update(?nonvar) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

subject

category

1.14.2 subject

Smalltalk dependent handling predicates.

Availability:

logtalk_load(dependents(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2003-02-09

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - changed/0
 - changed/1
 - dependents/1
 - addDependent/1
 - removeDependent/1
- Protected predicates
- Private predicates
 - dependent_/1
- Operators

Public predicates

changed/0

Receiver changed in some way. Notify all dependents.

Compilation flags:

static

Mode and number of proofs:

changed - one

changed/1

Receiver changed as specified in the argument. Notify all dependents.

Compilation flags:

static

Template:

changed(Change)

Mode and number of proofs:

changed(?nonvar) - one

dependents/1

Returns a list of all dependent objects.

Compilation flags:

static

Template:

dependents(Dependents)

Mode and number of proofs:

dependents(-list) - one

addDependent/1

Adds a new dependent object.

Compilation flags:

static

Template:

addDependent(Dependent)

Mode and number of proofs:

addDependent(@object) - one

removeDependent/1

Removes a dependent object.

Compilation flags:

static

Template:

removeDependent(Dependent)

Mode and number of proofs:

removeDependent(?object) - zero_or_more

Protected predicates

(none)

Private predicates

dependent_/1

Table of dependent objects.

Compilation flags:

dynamic

Template:

dependent_(Dependent)

Mode and number of proofs:

dependent_(?object) - zero_or_more

Operators

(none)

See also:

[observer](#)

1.15 diagrams

[object](#)

1.15.1 d2_graph_language

Predicates for generating graph files in the DOT language (version 2.36.0 or later).

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 1:1:0

Date: 2024-12-07

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public graph_language_protocol
```

Imports:

```
public options
```

Provides:

```
graph_language_registry::language_object/2
```

Uses:

```
list
```

```
os
```

```
term_io
```

```
user
```

Remarks:

```
(none)
```

Inherited public predicates:

```
check_option/1 check_options/1 default_option/1 default_options/1 edge/6 file_footer/3
file_header/3 graph_footer/5 graph_header/5 node/7 option/2 option/3 output_file_name/2
valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.15.2 diagram(Format)

- Format - Graph language file format.

Common predicates for generating diagrams.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 3:15:0

Date: 2024-12-04

Compilation flags:

```
static
```

Extends:

```
public options
```

Provides:

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Uses:

```
graph_language_registry
```

```
list
```

```
logtalk
```

```
modules_diagram_support
```

```
os
```

pairs
type
user

Remarks:

(none)

Inherited public predicates:

check_option/1 check_options/1 default_option/1 default_options/1 option/2 option/3
valid_option/1 valid_options/1

- Public predicates
 - libraries/3
 - libraries/2
 - libraries/1
 - all_libraries/1
 - all_libraries/0
 - rlibrary/2
 - rlibrary/1
 - library/2
 - library/1
 - directories/3
 - directories/2
 - rdirectory/3
 - rdirectory/2
 - rdirectory/1
 - directory/3
 - directory/2
 - directory/1
 - files/3
 - files/2
 - files/1
 - all_files/1
 - all_files/0
 - format_object/1
 - diagram_description/1

- diagram_name_suffix/1
- Protected predicates
 - diagram_caption/3
 - output_rlibrary/3
 - output_library/3
 - output_rdirectory/3
 - output externals/1
 - output_files/2
 - output_file/4
 - output_sub_diagrams/1
 - reset/0
 - output_node/6
 - node/6
 - edge/5
 - output_edges/1
 - save_edge/5
 - output_missing_externals/1
 - not_excluded_file/4
 - output_file_path/4
 - locate_library/2
 - locate_directory/2
 - locate_file/5
 - ground_entity_identifier/3
 - filter_file_extension/3
 - filter_external_file_extension/3
 - add_link_options/3
 - supported_editor_url_scheme_prefix/1
 - omit_path_prefix/3
 - add_node_zoom_option/4
 - message_diagram_description/1
- Private predicates
 - node_/6
 - node_path_/2
 - edge_/5
- Operators

Public predicates

libraries/3

Creates a diagram for a set of libraries using the specified options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

libraries(Project,Libraries,Options)

Mode and number of proofs:

libraries(+atom,+list(atom),+list(compound)) - one

libraries/2

Creates a diagram for a set of libraries using the default options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

libraries(Project,Libraries)

Mode and number of proofs:

libraries(+atom,+list(atom)) - one

libraries/1

Creates a diagram for a set of libraries using the default options. The prefix libraries is used for the diagram file name.

Compilation flags:

static

Template:

libraries(Libraries)

Mode and number of proofs:

libraries(+list(atom)) - one

all_libraries/1

Creates a diagram for all loaded libraries using the specified options.

Compilation flags:

static

Template:

all_libraries(Options)

Mode and number of proofs:

all_libraries(+list(compound)) - one

all_libraries/0

Creates a diagram for all loaded libraries using default options.

Compilation flags:

static

Mode and number of proofs:

all_libraries - one

rlibrary/2

Creates a diagram for a library and its sub-libraries using the specified options.

Compilation flags:

static

Template:

rlibrary(Library,Options)

Mode and number of proofs:

rlibrary(+atom,+list(compound)) - one

rlibrary/1

Creates a diagram for a library and its sub-libraries using default options.

Compilation flags:

static

Template:

rlibrary(Library)

Mode and number of proofs:

rlibrary(+atom) - one

library/2

Creates a diagram for a library using the specified options.

Compilation flags:

static

Template:

library(Library,Options)

Mode and number of proofs:

library(+atom,+list(compound)) - one

library/1

Creates a diagram for a library using default options.

Compilation flags:

static

Template:

library(Library)

Mode and number of proofs:

library(+atom) - one

directories/3

Creates a diagram for a set of directories using the specified options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

directories(Project,Directories,Options)

Mode and number of proofs:

directories(+atom,+list(atom),+list(compound)) - one

directories/2

Creates a diagram for a set of directories using the default options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

directories(Project,Directories)

Mode and number of proofs:

directories(+atom,+list(atom)) - one

rdirectory/3

Creates a diagram for a directory and its sub-directories using the specified options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Project,Directory,Options)

Mode and number of proofs:

rdirectory(+atom,+atom,+list(compound)) - one

rdirectory/2

Creates a diagram for a directory and its sub-directories using default options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Project,Directory)

Mode and number of proofs:

rdirectory(+atom,+atom) - one

rdirectory/1

Creates a diagram for a directory and its sub-directories using default options. The name of the directory is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Directory)

Mode and number of proofs:

rdirectory(+atom) - one

directory/3

Creates a diagram for a directory using the specified options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

directory(Project,Directory,Options)

Mode and number of proofs:

directory(+atom,+atom,+list(compound)) - one

directory/2

Creates a diagram for a directory using default options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

directory(Project,Directory)

Mode and number of proofs:

directory(+atom,+atom) - one

directory/1

Creates a diagram for a directory using default options. The name of the directory is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

files/3

Creates a diagram for a set of files using the specified options. The file can be specified by name, basename, full path, or using library notation. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

files(Project,Files,Options)

Mode and number of proofs:

files(+atom,+list(atom),+list(compound)) - one

files/2

Creates a diagram for a set of files using the default options. The file can be specified by name, basename, full path, or using library notation. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

files(Project,Files)

Mode and number of proofs:

files(+atom,+list(atom)) - one

files/1

Creates a diagram for a set of files using the default options. The file can be specified by name, basename, full path, or using library notation. The prefix files is used for the diagram file name.

Compilation flags:

static

Template:

files(Files)

Mode and number of proofs:

files(+list(atom)) - one

all_files/1

Creates a diagram for all loaded files using the specified options.

Compilation flags:

static

Template:

all_files(Options)

Mode and number of proofs:

all_files(+list(compound)) - one

all_files/0

Creates a diagram for all loaded files using default options.

Compilation flags:

static

Mode and number of proofs:

all_files - one

format_object/1

Returns the identifier of the object implementing the graph language currently being used. Fails if none is specified.

Compilation flags:

static

Template:

format_object(Object)

Mode and number of proofs:

format_object(-object_identifier) - zero_or_one

diagram_description/1

Returns the diagram description.

Compilation flags:

static

Template:

diagram_description(Description)

Mode and number of proofs:

diagram_description(-atom) - one

diagram_name_suffix/1

Returns the diagram name suffix.

Compilation flags:

static

Template:

diagram_name_suffix(Suffix)

Mode and number of proofs:

diagram_name_suffix(-atom) - one

Protected predicates

diagram_caption/3

Creates a diagram caption from the diagram description and the subject and its kind.

Compilation flags:

static

Template:

diagram_caption(Kind,Subject,Description)

Mode and number of proofs:

diagram_caption(+atom,+callable,-atom) - one

output_rlibrary/3

Generates diagram output for a library and its sub-libraries using the specified options.

Compilation flags:

static

Template:

output_rlibrary(Library,Path,Options)

Mode and number of proofs:

output_rlibrary(+atom,+atom,+list(compound)) - one

output_library/3

Generates diagram output for a library using the specified options.

Compilation flags:

static

Template:

output_library(Library,Path,Options)

Mode and number of proofs:

output_library(+atom,+atom,+list(compound)) - one

output_rdirectory/3

Generates diagram output for a directory and its sub-directories using the specified options.

Compilation flags:

static

Template:

output_rdirectory(Project,Path,Options)

Mode and number of proofs:

output_rdirectory(+atom,+atom,+list(compound)) - one

output externals/1

Output external nodes using the specified options depending on the value of the boolean option externals/1.

Compilation flags:

static

Template:

output_externals(Options)

Mode and number of proofs:

`output_externals(+list(compound))` - one

`output_files/2`

Generates diagram output for a list of files using the specified options.

Compilation flags:

`static`

Template:

`output_files(Files,Options)`

Mode and number of proofs:

`output_files(+list,+list(compound))` - one

`output_file/4`

Generates diagram output for a file using the specified options.

Compilation flags:

`static`

Template:

`output_file(Path,Basename,Directory,Options)`

Mode and number of proofs:

`output_file(+atom,+atom,+atom,+list(compound))` - one

`output_sub_diagrams/1`

Outputs sub-diagrams using the specified options.

Compilation flags:

`static`

Template:

output_sub_diagrams(Options)

Mode and number of proofs:

output_sub_diagrams(+list(compound)) - one

reset/0

Resets all temporary information used when generating a diagram.

Compilation flags:

static

Mode and number of proofs:

reset - one

output_node/6

Outputs a graph node.

Compilation flags:

static

Template:

output_node(Identifier,Label,Caption,Contents,Kind,Options)

Mode and number of proofs:

output_node(+nonvar,+nonvar,+nonvar,+list(nonvar),+atom,+list(compound)) - one

node/6

Enumerates, by backtracking, all saved nodes.

Compilation flags:

static

Template:

node(Identifier,Label,Caption,Contents,Kind,Options)

Mode and number of proofs:

node(?nonvar,?nonvar,?nonvar,?list(compound),?atom,?list(compound)) - zero_or_more

edge/5

Enumerates, by backtracking, all saved edges.

Compilation flags:

static

Template:

edge(From,To,Labels,Kind,Options)

Mode and number of proofs:

edge(?nonvar,?nonvar,?list(nonvar),?atom,?list(compound)) - zero_or_more

output_edges/1

Outputs all edges.

Compilation flags:

static

Template:

output_edges(Options)

Mode and number of proofs:

output_edges(+list(compound)) - one

save_edge/5

Saves a graph edge.

Compilation flags:

static

Template:

save_edge(From,To,Labels,Kind,Options)

Mode and number of proofs:

save_edge(+nonvar,+nonvar,+list(nonvar),+atom,+list(compound)) - one

output_missing externals/1

Outputs missing external nodes (usually due to unloaded resources) that are referenced from edges.

Compilation flags:

static

Template:

output_missing_externals(Options)

Mode and number of proofs:

output_missing_externals(+list(compound)) - one

not_excluded_file/4

True when the given file is not excluded from the generated output. Excluded files may be specified by full path or by basename and with or without extension. Excluded directories may be listed by full or relative path.

Compilation flags:

static

Template:

not_excluded_file(Path,Basename,ExcludedDirectories,ExcludedFiles)

Mode and number of proofs:

not_excluded_file(+atom,+atom,+list(atom),+list(atom)) - zero_or_one

`output_file_path/4`

Returns the output file path.

Compilation flags:

`static`

Template:

`output_file_path(Name,Options,Format,Path)`

Mode and number of proofs:

`output_file_path(+atom,+list(atom),+object_identifier,-atom) - one`

`locate_library/2`

Locates a library given its name.

Compilation flags:

`static`

Template:

`locate_library(Library,Path)`

Mode and number of proofs:

`locate_library(+atom,-atom) - one`

`locate_directory/2`

Locates a directory given its name or full path.

Compilation flags:

`static`

Template:

`locate_directory(Directory,Path)`

Mode and number of proofs:

locate_directory(+atom,-atom) - one

locate_file/5

Locates a file given its name, basename, full path, or library notation representation.

Compilation flags:

static

Template:

locate_file(File,Basename,Extension,Directory,Path)

Mode and number of proofs:

locate_file(+atom,+atom,+atom,+atom,-atom) - one

ground_entity_identifier/3

Converts an entity identifier to a ground term.

Compilation flags:

static

Template:

ground_entity_identifier(Kind,Identifier,GroundIdentifier)

Mode and number of proofs:

ground_entity_identifier(+atom,+callable,-callable) - one

filter_file_extension/3

Filters the file name extension depending on the file_extensions/1 option.

Compilation flags:

static

Template:

`filter_file_extension(Basename,Options,Name)`

Mode and number of proofs:

`filter_file_extension(+atom,+list(compound),-atom) - one`

`filter_external_file_extension/3`

Filters the external file name extension depending on the `file_extensions/1` option.

Compilation flags:

`static`

Template:

`filter_external_file_extension(Path,Options,Name)`

Mode and number of proofs:

`filter_external_file_extension(+atom,+list(compound),-atom) - one`

`add_link_options/3`

Adds `url/1`, `urls/2`, and `tooltip/1` link options (for use by the graph language) based on the specified path to the list of options.

Compilation flags:

`static`

Template:

`add_link_options(Path,Options,LinkingOptions)`

Mode and number of proofs:

`add_link_options(+atom,+list(compound),-list(compound)) - one`

supported_editor_url_scheme_prefix/1

Table of prefixes for text editors that supports a URL scheme to open diagram links.

Compilation flags:

static

Template:

supported_editor_url_scheme_prefix(Prefix)

Mode and number of proofs:

supported_editor_url_scheme_prefix(?atom) - zero_or_more

omit_path_prefix/3

Removes a prefix from a path, returning the relative path, when using the option omit_path_prefixes/1. Used mainly for constructing directory and file node identifiers and captions.

Compilation flags:

static

Template:

omit_path_prefix(Path,Options,Relative)

Mode and number of proofs:

omit_path_prefix(+atom,+list(compound),-atom) - one

add_node_zoom_option/4

Adds node zoom options when using the zoom option.

Compilation flags:

static

Template:

add_node_zoom_option(Identifier,Suffix,Options,NodeOptions)

Mode and number of proofs:

add_node_zoom_option(+atom,+atom,+list(compound),-list(compound)) - one

message_diagram_description/1

Diagram description for progress messages.

Compilation flags:

static

Template:

message_diagram_description(Description)

Mode and number of proofs:

message_diagram_description(?atom) - one

Private predicates

node_/6

Table of saved nodes.

Compilation flags:

dynamic

Template:

node_(Identifier,Label,Caption,Contents,Kind,Options)

Mode and number of proofs:

node_(?nonvar,?nonvar,?nonvar,?list(compound),?atom,?list(compound)) - zero_or_more

node_path_/2

Table of node paths.

Compilation flags:

dynamic

Template:

node_path_(Node,Path)

Mode and number of proofs:

node_path_(?ground,?list(ground)) - zero_or_more

edge_/5

Table of saved edges.

Compilation flags:

dynamic

Template:

edge_(From,To,Labels,Kind,Options)

Mode and number of proofs:

edge_(?nonvar,?nonvar,?list(nonvar),?atom,?list(compound)) - zero_or_more

Operators

(none)

object

1.15.3 diagrams

Predicates for generating all supported diagrams for libraries, directories, and files in one step using the DOT format.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:1:0

Date: 2019-04-07

Compilation flags:

static, context_switching_calls

Extends:

public diagrams(dot)

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 directories/2 directories/3 directory/1
directory/2 directory/3 files/1 files/2 files/3 libraries/1 libraries/2 libraries/3 library/1
library/2 rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.15.4 diagrams(Format)

- Format - Graph language file format.

Predicates for generating all supported diagrams for libraries, directories, or files in one step using the specified format.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:8:0

Date: 2019-06-13

Compilation flags:

static, context_switching_calls

Uses:

list

os

Remarks:

- Common options: title/1, date/1, output_directory/1, relation_labels/1, node_type_captions/1, exclude_files/1, exclude_libraries/1, url_prefixes/1, omit_path_prefix/1, entity_url_suffix_target/2, and layout/1.
- Limitations: Some of the provided predicates only make sense for some types of diagrams. Also, fine tuning may require generating individual diagrams directly instead of as a batch using this utility object.

Inherited public predicates:

(none)

- Public predicates
 - libraries/3
 - libraries/2
 - libraries/1
 - all_libraries/1
 - all_libraries/0
 - rlibrary/2
 - rlibrary/1
 - library/2
 - library/1
 - directories/3
 - directories/2
 - rdirectory/3
 - rdirectory/2
 - rdirectory/1

- directory/3
- directory/2
- directory/1
- files/3
- files/2
- files/1
- all_files/1
- all_files/0
- Protected predicates
- Private predicates
- Operators

Public predicates

libraries/3

Creates all supported diagrams for a set of libraries using the specified options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

libraries(Project,Libraries,Options)

Mode and number of proofs:

libraries(+atom,+list(atom),+list(compound)) - one

libraries/2

Creates all supported diagrams for a set of libraries using the default options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

libraries(Project,Libraries)

Mode and number of proofs:

libraries(+atom,+list(atom)) - one

libraries/1

Creates all supported diagrams for a set of libraries using the default options. The prefix libraries is used for the diagram file names.

Compilation flags:

static

Template:

libraries(Libraries)

Mode and number of proofs:

libraries(+list(atom)) - one

all_libraries/1

Creates all supported diagrams for all loaded libraries using the specified options.

Compilation flags:

static

Template:

all_libraries(Options)

Mode and number of proofs:

all_libraries(+list(compound)) - one

`all_libraries/0`

Creates all supported diagrams for all loaded libraries using default options.

Compilation flags:

`static`

Mode and number of proofs:

`all_libraries - one`

`rlibrary/2`

Creates all supported diagrams for a library and its sub-libraries using the specified options.

Compilation flags:

`static`

Template:

`rlibrary(Library,Options)`

Mode and number of proofs:

`rlibrary(+atom,+list(compound)) - one`

`rlibrary/1`

Creates all supported diagrams for a library and its sub-libraries using default options.

Compilation flags:

`static`

Template:

`rlibrary(Library)`

Mode and number of proofs:

`rlibrary(+atom) - one`

library/2

Creates all supported diagrams for a library using the specified options.

Compilation flags:

static

Template:

library(Library,Options)

Mode and number of proofs:

library(+atom,+list(compound)) - one

library/1

Creates all supported diagrams for a library using default options.

Compilation flags:

static

Template:

library(Library)

Mode and number of proofs:

library(+atom) - one

directories/3

Creates all supported diagrams for a set of directories using the specified options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

directories(Project,Directories,Options)

Mode and number of proofs:

directories(+atom,+list(atom),+list(compound)) - one

directories/2

Creates all supported diagrams for a directory using default options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

directories(Project,Directories)

Mode and number of proofs:

directories(+atom,+list(atom)) - one

rdirectory/3

Creates all supported diagrams for a directory and its sub-directories using the specified options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Project,Directory,Options)

Mode and number of proofs:

rdirectory(+atom,+atom,+list(compound)) - one

rdirectory/2

Creates all supported diagrams for a directory and its sub-directories using default options. The Project argument is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Project,Directory)

Mode and number of proofs:

rdirectory(+atom,+atom) - one

rdirectory/1

Creates all supported diagrams for a directory and its sub-directories using default options. The name of the directory is used as a prefix for the diagram file name.

Compilation flags:

static

Template:

rdirectory(Directory)

Mode and number of proofs:

rdirectory(+atom) - one

directory/3

Creates all supported diagrams for a directory using the specified options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

directory(Project,Directory,Options)

Mode and number of proofs:

directory(+atom,+atom,+list(compound)) - one

directory/2

Creates all supported diagrams for a directory using default options. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

directory(Project,Directory)

Mode and number of proofs:

directory(+atom,+atom) - one

directory/1

Creates all supported diagrams for a directory using default options. The name of the directory is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

files/3

Creates all supported diagrams for a set of files using the specified options. The file can be specified by name, basename, full path, or using library notation. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

static

Template:

files(Project,Files,Options)

Mode and number of proofs:

`files(+atom,+list(atom),+list(compound)) - one`

`files/2`

Creates all supported diagrams for a set of files using the default options. The file can be specified by name, basename, full path, or using library notation. The Project argument is used as a prefix for the diagram file names.

Compilation flags:

`static`

Template:

`files(Project,Files)`

Mode and number of proofs:

`files(+atom,+list(atom)) - one`

`files/1`

Creates all supported diagrams for a set of files using the default options. The file can be specified by name, basename, full path, or using library notation. The prefix “files” is used for the diagram file names.

Compilation flags:

`static`

Template:

`files(Files)`

Mode and number of proofs:

`files(+list(atom)) - one`

all_files/1

Creates all supported diagrams for all loaded files using the specified options.

Compilation flags:

static

Template:

all_files(Options)

Mode and number of proofs:

all_files(+list(compound)) - one

all_files/0

Creates all supported diagrams for all loaded files using default options.

Compilation flags:

static

Mode and number of proofs:

all_files - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.15.5 directory_dependency_diagram

Predicates for generating directory dependency diagrams in DOT format.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2019-04-07

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public directory_dependency_diagram(dot)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`directory_load_diagram`, `file_load_diagram`

`object`

1.15.6 `directory_dependency_diagram`(Format)

- Format - Graph language file format.

Predicates for generating directory dependency diagrams. A dependency exists when an entity in one directory makes a reference to an entity in another directory.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 3:0:1

Date: 2024-04-01

Compilation flags:

`static`, `context_switching_calls`

Imports:

`public directory_diagram`(Format)

Uses:

`file_dependency_diagram`(Format)

`list`

`logtalk`

`modules_diagram_support`

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
 default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
 directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/2
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sub_diagram_/2

Table of directory sub-diagrams to support their generation.

Compilation flags:

dynamic

Template:

sub_diagram_(Project,Directory)

Mode and number of proofs:

sub_diagram_(?atom,?atom) - zero_or_more

Operators

(none)

See also:

`directory_load_diagram(Format)`, `file_load_diagram(Format)`, `library_load_diagram(Format)`
category

1.15.7 `directory_diagram(Format)`

- Format - Graph language file format.

Common predicates for generating directory diagrams.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 1:13:0

Date: 2024-12-04

Compilation flags:

`static`

Extends:

`public diagram(Format)`

Uses:

`list`

Remarks:

(none)

Inherited public predicates:

`all_files/0` `all_files/1` `all_libraries/0` `all_libraries/1` `check_option/1` `check_options/1`
`default_option/1` `default_options/1` `diagram_description/1` `diagram_name_suffix/1` `directories/2`
`directories/3` `directory/1` `directory/2` `directory/3` `files/1` `files/2` `files/3` `format_object/1`
`libraries/1` `libraries/2` `libraries/3` `library/1` `library/2` `option/2` `option/3` `rdirectory/1`
`rdirectory/2` `rdirectory/3` `rlibrary/1` `rlibrary/2` `valid_option/1` `valid_options/1`

- Public predicates
- Protected predicates
 - `remember_included_directory/1`

- remember_referenced_logtalk_directory/1
- remember_referenced_prolog_directory/1
- Private predicates
 - included_directory_/1
 - referenced_logtalk_directory_/1
 - referenced_prolog_directory_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

remember_included_directory/1

Remember included Logtalk directory in the diagram.

Compilation flags:

static

Template:

remember_included_directory(Path)

Mode and number of proofs:

remember_included_directory(+atom) - one

remember_referenced_logtalk_directory/1

Remember referenced Logtalk directory in the diagram.

Compilation flags:

static

Template:

remember_referenced_logtalk_directory(Path)

Mode and number of proofs:

remember_referenced_logtalk_directory(+atom) - one

`remember_referenced_prolog_directory/1`

Remember referenced Prolog directory in the diagram.

Compilation flags:

`static`

Template:

`remember_referenced_prolog_directory(Path)`

Mode and number of proofs:

`remember_referenced_prolog_directory(+atom) - one`

Private predicates

`included_directory_/1`

Table of Logtalk directories already included in the diagram.

Compilation flags:

`dynamic`

Template:

`included_directory_(Path)`

Mode and number of proofs:

`included_directory_(?atom) - zero_or_more`

`referenced_logtalk_directory_/1`

Table of referenced Logtalk directories in the diagram.

Compilation flags:

`dynamic`

Template:

referenced_logtalk_directory_(Path)

Mode and number of proofs:

referenced_logtalk_directory_(?atom) - zero_or_more

referenced_prolog_directory_/1

Table of referenced Prolog directories in the diagram.

Compilation flags:

dynamic

Template:

referenced_prolog_directory_(Path)

Mode and number of proofs:

referenced_prolog_directory_(?atom) - zero_or_more

Operators

(none)

object

1.15.8 directory_load_diagram

Predicates for generating directory loading dependency diagrams in DOT format.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2019-04-07

Compilation flags:

static, context_switching_calls

Extends:

public directory_load_diagram(dot)

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

directory_dependency_diagram, file_dependency_diagram
object

1.15.9 directory_load_diagram(Format)

- Format - Graph language file format.

Predicates for generating directory loading dependency diagrams.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 3:0:1

Date: 2024-04-01

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public directory_diagram(Format)
```

Uses:

```
file_dependency_diagram(Format)
```

```
file_load_diagram(Format)
```

```
list
```

```
logtalk
```

```
modules_diagram_support
```

Remarks:

(none)

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/2
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

`sub_diagram_/2`

Table of directory sub-diagrams to support their generation.

Compilation flags:

`dynamic`

Template:

`sub_diagram_(Project,Directory)`

Mode and number of proofs:

`sub_diagram_(?atom,?atom) - zero_or_more`

Operators

(none)

See also:

`directory_dependency_diagram(Format),` `file_dependency_diagram(Format),` `li-`
`brary_dependency_diagram(Format)`
object

1.15.10 `dot_graph_language`

Predicates for generating graph files in the DOT language (version 2.36.0 or later).

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 3:11:0

Date: 2024-12-07

Compilation flags:

static, context_switching_calls

Implements:

public graph_language_protocol

Imports:

public options

Provides:

graph_language_registry::language_object/2

Uses:

list

os

term_io

user

Remarks:

(none)

Inherited public predicates:

check_option/1 check_options/1 default_option/1 default_options/1 edge/6 file_footer/3
file_header/3 graph_footer/5 graph_header/5 node/7 option/2 option/3 output_file_name/2
valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.15.11 entity_diagram

Predicates for generating entity diagrams in DOT format with both inheritance and cross-referencing relation edges.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:0:0

Date: 2014-01-01

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public entity_diagram(dot)
```

Remarks:

(none)

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`inheritance_diagram`, `uses_diagram`, `xref_diagram`
object

1.15.12 `entity_diagram`(Format)

- Format - Graph language file format.

Predicates for generating entity diagrams in the specified format with both inheritance and cross-referencing relation edges.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:60:0

Date: 2024-12-04

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public diagram(Format)
```

Uses:

```
list
logtalk
modules_diagram_support
user
```

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
 - file/2
 - file/1
- Protected predicates
- Private predicates
 - included_entity_/1
 - included_module_/1
 - referenced_entity_/2
 - referenced_module_/2
- Operators

Public predicates

file/2

Creates a diagram for all entities in a loaded source file using the specified options. The file can be specified by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

file(File,Options)

Mode and number of proofs:

file(+atom,+list(compound)) - one

file/1

Creates a diagram for all entities in a loaded source file using default options. The file can be specified by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

file(File)

Mode and number of proofs:

file(+atom) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

included_entity_/1

Table of Logtalk entities already included in the diagram.

Compilation flags:

dynamic

Template:

included_entity_(Entity)

Mode and number of proofs:

included_entity_(?entity_identifier) - zero_or_more

included_module_/1

Table of Prolog modules already included in the diagram.

Compilation flags:

dynamic

Template:

included_module_(Module)

Mode and number of proofs:

included_module_(?module_identifier) - zero_or_more

referenced_entity_/2

Table of referenced Logtalk entities in the diagram.

Compilation flags:

dynamic

Template:

referenced_entity_(Referencer,Entity)

Mode and number of proofs:

referenced_entity_(?entity_identifier,?entity_identifier) - zero_or_more

referenced_module_/2

Table of referenced Logtalk entities in the diagram.

Compilation flags:

dynamic

Template:

referenced_module_(Referencer,Entity)

Mode and number of proofs:

referenced_module_(?entity_identifier,?module_identifier) - zero_or_more

Operators

(none)

See also:

`inheritance_diagram(Format)`, `uses_diagram(Format)`, `xref_diagram(Format)`, `library_diagram(Format)`
object

1.15.13 `file_dependency_diagram`

Predicates for generating file contents dependency diagrams in DOT format. A dependency exists when an entity in one file makes a reference to an entity in another file.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:1:0

Date: 2019-06-13

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public file_dependency_diagram(dot)
```

Remarks:

(none)

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`file_load_diagram`, `directory_load_diagram`, `library_load_diagram`
object

1.15.14 `file_dependency_diagram`(Format)

- Format - Graph language file format.

Predicates for generating file contents dependency diagrams. A dependency exists when an entity in one file makes a reference to an entity in another file.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:28:3

Date: 2024-04-01

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public file_diagram(Format)
```

Uses:

```
entity_diagram(Format)  
list  
logtalk  
modules_diagram_support  
os
```

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
 default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
 directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sub_diagram_/1

Table of file sub-diagrams to support their generation.

Compilation flags:

dynamic

Template:

sub_diagram_(File)

Mode and number of proofs:

sub_diagram_(?atom) - zero_or_more

Operators

(none)

See also:

`file_load_diagram(Format)`, `directory_load_diagram(Format)`, `library_load_diagram(Format)`
`category`

1.15.15 `file_diagram(Format)`

- Format - Graph language file format.

Common predicates for generating file diagrams.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 2:14:0

Date: 2024-12-04

Compilation flags:

`static`

Extends:

`public diagram(Format)`

Uses:

`list`

Remarks:

(none)

Inherited public predicates:

`all_files/0` `all_files/1` `all_libraries/0` `all_libraries/1` `check_option/1` `check_options/1`
`default_option/1` `default_options/1` `diagram_description/1` `diagram_name_suffix/1` `directories/2`
`directories/3` `directory/1` `directory/2` `directory/3` `files/1` `files/2` `files/3` `format_object/1`
`libraries/1` `libraries/2` `libraries/3` `library/1` `library/2` `option/2` `option/3` `rdirectory/1`
`rdirectory/2` `rdirectory/3` `rlibrary/1` `rlibrary/2` `valid_option/1` `valid_options/1`

- Public predicates
- Protected predicates
 - `remember_included_file/1`

- remember_referenced_logtalk_file/1
- remember_referenced_prolog_file/1
- Private predicates
 - included_file_/1
 - referenced_logtalk_file_/1
 - referenced_prolog_file_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

remember_included_file/1

Remember included Logtalk file in the diagram.

Compilation flags:

static

Template:

remember_included_file(Path)

Mode and number of proofs:

remember_included_file(+atom) - one

remember_referenced_logtalk_file/1

Remember referenced Logtalk file in the diagram.

Compilation flags:

static

Template:

remember_referenced_logtalk_file(Path)

Mode and number of proofs:

remember_referenced_logtalk_file(+atom) - one

`remember_referenced_prolog_file/1`

Remember referenced Prolog file in the diagram.

Compilation flags:

`static`

Template:

`remember_referenced_prolog_file(Path)`

Mode and number of proofs:

`remember_referenced_prolog_file(+atom) - one`

Private predicates

`included_file_/1`

Table of Logtalk files already included in the diagram.

Compilation flags:

`dynamic`

Template:

`included_file_(Path)`

Mode and number of proofs:

`included_file_(?atom) - zero_or_more`

`referenced_logtalk_file_/1`

Table of referenced Logtalk files in the diagram.

Compilation flags:

`dynamic`

Template:

referenced_logtalk_file_(Path)

Mode and number of proofs:

referenced_logtalk_file_(?atom) - zero_or_more

referenced_prolog_file_/1

Table of referenced Prolog files in the diagram.

Compilation flags:

dynamic

Template:

referenced_prolog_file_(Path)

Mode and number of proofs:

referenced_prolog_file_(?atom) - zero_or_more

Operators

(none)

object

1.15.16 file_load_diagram

Predicates for generating file loading dependency diagrams in DOT format. A dependency exists when a file loads or includes another file.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:1:0

Date: 2019-06-13

Compilation flags:

static, context_switching_calls

Extends:

```
public file_load_diagram(dot)
```

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

file_dependency_diagram, directory_dependency_diagram, library_dependency_diagram
object

1.15.17 file_load_diagram(Format)

- Format - Graph language file format.

Predicates for generating file loading dependency diagrams. A dependency exists when a file loads or includes another file.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:30:3

Date: 2024-12-05

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public file_diagram(Format)
```

Uses:

```
entity_diagram(Format)
list
logtalk
modules_diagram_support
os
```

Remarks:

(none)

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sub_diagram_/1

Table of file sub-diagrams to support their generation.

Compilation flags:

dynamic

Template:

sub_diagram_(File)

Mode and number of proofs:

sub_diagram_(?atom) - zero_or_more

Operators

(none)

See also:

file_dependency_diagram(Format),
brary_dependency_diagram(Format)

directory_dependency_diagram(Format),

li-

protocol

1.15.18 graph_language_protocol

Predicates for generating graph files.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:0:0

Date: 2014-12-30

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - output_file_name/2
 - file_header/3
 - file_footer/3
 - graph_header/5
 - graph_footer/5
 - node/7
 - edge/6
- Protected predicates
- Private predicates
- Operators

Public predicates

output_file_name/2

Constructs the diagram file basename by adding a graph language dependent extension to the given name.

Compilation flags:

static

Template:

output_file_name(Name,Basename)

Mode and number of proofs:

output_file_name(+atom,-atom) - one

file_header/3

Writes the output file header using the specified options.

Compilation flags:

static

Template:

file_header(Stream,Identifier,Options)

Mode and number of proofs:

file_header(+stream_or_alias,+atom,+list(compound)) - one

file_footer/3

Writes the output file footer using the specified options.

Compilation flags:

static

Template:

file_footer(Stream,Identifier,Options)

Mode and number of proofs:

file_footer(+stream_or_alias,+atom,+list(compound)) - one

graph_header/5

Writes a graph header using the specified options.

Compilation flags:

static

Template:

graph_header(Stream,Identifier,Label,Kind,Options)

Mode and number of proofs:

graph_header(+stream_or_alias,+atom,+atom,+atom,+list(compound)) - one

graph_footer/5

Writes a graph footer using the specified options.

Compilation flags:

static

Template:

graph_footer(Stream,Identifier,Label,Kind,Options)

Mode and number of proofs:

graph_footer(+stream_or_alias,+atom,+atom,+atom,+list(compound)) - one

node/7

Writes a node using the specified options.

Compilation flags:

static

Template:

node(Stream,Identifier,Label,Caption,Lines,Kind,Options)

Mode and number of proofs:

node(+stream_or_alias,+nonvar,+nonvar,+nonvar,+list(nonvar),+atom,+list(compound)) - one

edge/6

Writes an edge between two nodes using the specified options.

Compilation flags:

static

Template:

edge(Stream,Start,End,Labels,Kind,Options)

Mode and number of proofs:

edge(+stream_or_alias,+nonvar,+nonvar,+list(nonvar),+atom,+list(compound)) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.15.19 graph_language_registry

Registry of implemented graph languages.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 1:0:1

Date: 2020-03-25

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - language_object/2
- Protected predicates
- Private predicates

- Operators

Public predicates

language_object/2

Table of defined graph languages and their implementation objects.

Compilation flags:
static, multifile

Template:
language_object(Language, Object)

Mode and number of proofs:
language_object(?atom, ?object_identifier) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.15.20 inheritance_diagram

Predicates for generating entity diagrams in DOT format with inheritance relation edges but no cross-referencing relation edges.

Availability:
logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:0:0

Date: 2014-01-15

Compilation flags:

static, context_switching_calls

Extends:

public inheritance_diagram(dot)

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

entity_diagram, uses_diagram, xref_diagram

object

1.15.21 inheritance_diagram(Format)

- Format - Graph language file format.

Predicates for generating entity diagrams in the specified format with inheritance relation edges but no cross-referencing relation edges.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:20:0

Date: 2024-03-20

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public entity_diagram(Format)
```

Uses:

```
logtalk
```

Remarks:

```
(none)
```

Inherited public predicates:

```
all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`entity_diagram(Format)`, `uses_diagram(Format)`, `xref_diagram(Format)`
object

1.15.22 library_dependency_diagram

Predicates for generating library dependency diagrams in DOT format.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 2:1:0

Date: 2019-06-13

Compilation flags:

`static`, `context_switching_calls`

Extends:

`public library_dependency_diagram(dot)`

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
 default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
 directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

library_load_diagram, file_load_diagram, entity_diagram

object

1.15.23 library_dependency_diagram(Format)

- Format - Graph language file format.

Predicates for generating library dependency diagrams. A dependency exists when an entity in one library makes a reference to an entity in another library.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:33:1

Date: 2024-04-01

Compilation flags:

static, context_switching_calls

Imports:

public library_diagram(Format)

Uses:

entity_diagram(Format)

list

logtalk

modules_diagram_support

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sub_diagram_/1

Table of library sub-diagrams to support their generation.

Compilation flags:

dynamic

Template:

sub_diagram_(Library)

Mode and number of proofs:

sub_diagram_(?atom) - zero_or_more

Operators

(none)

See also:

library_load_diagram(Format), directory_load_diagram(Format), file_load_diagram(Format), entity_diagram(Format)

category

1.15.24 library_diagram(Format)

- Format - Graph language file format.

Common predicates for generating library diagrams.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:17:0

Date: 2024-12-04

Compilation flags:

static

Extends:

public diagram(Format)

Uses:

list

user

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
 - add_library_documentation_url/4
 - remember_included_library/2
 - remember_referenced_logtalk_library/2
 - remember_referenced_prolog_library/2
- Private predicates
 - included_library_/2
 - referenced_logtalk_library_/2
 - referenced_prolog_library_/2
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

`add_library_documentation_url/4`

Adds a documentation URL when using the option `url_prefixes/2`.

Compilation flags:

`static`

Template:

`add_library_documentation_url(Kind,Options,Library,NodeOptions)`

Mode and number of proofs:

`add_library_documentation_url(+atom,+list(compound),+atom,-list(compound)) - one`

`remember_included_library/2`

Remember included Logtalk library in the diagram.

Compilation flags:

`static`

Template:

`remember_included_library(Library,Path)`

Mode and number of proofs:

`remember_included_library(+atom,+atom) - one`

`remember_referenced_logtalk_library/2`

Remember referenced Logtalk library in the diagram.

Compilation flags:

`static`

Template:

remember_referenced_logtalk_library(Library,Path)

Mode and number of proofs:

remember_referenced_logtalk_library(+atom,+atom) - one

remember_referenced_prolog_library/2

Remember referenced Prolog library in the diagram.

Compilation flags:

static

Template:

remember_referenced_prolog_library(Library,Path)

Mode and number of proofs:

remember_referenced_prolog_library(+atom,+atom) - one

Private predicates

included_library_/2

Table of Logtalk libraries already included in the diagram.

Compilation flags:

dynamic

Template:

included_library_(Library,Path)

Mode and number of proofs:

included_library_(?atom,?atom) - zero_or_more

referenced_logtalk_library_/2

Table of referenced Logtalk libraries in the diagram.

Compilation flags:

dynamic

Template:

referenced_logtalk_library_(Library,Path)

Mode and number of proofs:

referenced_logtalk_library_(?atom,?atom) - zero_or_more

referenced_prolog_library_/2

Table of referenced Prolog libraries in the diagram.

Compilation flags:

dynamic

Template:

referenced_prolog_library_(Library,Path)

Mode and number of proofs:

referenced_prolog_library_(?atom,?atom) - zero_or_more

Operators

(none)

See also:

inheritance_diagram(Format), uses_diagram(Format), xref_diagram(Format), entity_diagram(Format)
object

1.15.25 library_load_diagram

Predicates for generating library loading dependency diagrams in DOT format.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:1:0

Date: 2019-06-13

Compilation flags:

static, context_switching_calls

Extends:

public library_load_diagram(dot)

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

library_dependency_diagram, file_dependency_diagram, entity_diagram
object

1.15.26 library_load_diagram(Format)

- Format - Graph language file format.

Predicates for generating library loading dependency diagrams.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:33:1

Date: 2024-04-01

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public library_diagram(Format)
```

Uses:

```
entity_diagram(Format)  
list  
logtalk  
modules_diagram_support
```

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 files/1 files/2 files/3 format_object/1
libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3 rdirectory/1
rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
 - sub_diagram_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sub_diagram_/1

Table of library sub-diagrams to support their generation.

Compilation flags:

dynamic

Template:

sub_diagram_(Library)

Mode and number of proofs:

sub_diagram_(?atom) - zero_or_more

Operators

(none)

See also:

library_dependency_diagram(Format), directory_dependency_diagram(Format),
file_dependency_diagram(Format), entity_diagram(Format)
object

1.15.27 modules_diagram_support

Utility predicates for supporting Prolog modules in diagrams.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 0:19:5

Date: 2022-07-08

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

- Supported backend Prolog systems: ECLiPSe, SICStus Prolog, SWI-Prolog, and YAP.

Inherited public predicates:

(none)

- Public predicates
 - module_property/2
 - loaded_file_property/2
 - source_file_extension/1
- Protected predicates
- Private predicates
- Operators

Public predicates

`module_property/2`

Access to module properties, at least `exports/1`, `file/1`, and `file/2` but also `declares/2`, `defines/2`, `calls/2`, and `provides/3` when possible.

Compilation flags:

`static`

Template:

`module_property(Module,Property)`

Mode and number of proofs:

`module_property(?atom,?callable) - zero_or_more`

`loaded_file_property/2`

Access to loaded source file properties, at least `basename/1`, `directory/1` but also `parent/1` when possible.

Compilation flags:

`static`

Template:

`loaded_file_property(File,Property)`

Mode and number of proofs:

`loaded_file_property(?atom,?callable) - zero_or_more`

`source_file_extension/1`

Valid source file extension for Prolog source files.

Compilation flags:

`static`

Template:

`source_file_extension(Extension)`

Mode and number of proofs:

source_file_extension(?atom) - one_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.15.28 uses_diagram

Predicates for generating entity diagrams in DOT format with only uses/2 and use_module/2 relation edges.

Availability:

logtalk_load(diagrams(loader))

Author: Paulo Moura

Version: 2:0:1

Date: 2020-03-27

Compilation flags:

static, context_switching_calls

Extends:

public uses_diagram(dot)

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[entity_diagram](#), [inheritance_diagram](#), [xref_diagram](#)

[object](#)

1.15.29 [uses_diagram](#)(Format)

- Format - Graph language file format.

Predicates for generating entity diagrams with only [uses/2](#) and [use_module/2](#) relation edges.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 2:21:0

Date: 2024-03-20

Compilation flags:

static, context_switching_calls

Extends:

public entity_diagram(Format)

Uses:

logtalk

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
 default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
 directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
 format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
 rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`entity_diagram(Format)`, `inheritance_diagram(Format)`, `xref_diagram(Format)`

object

1.15.30 xref_diagram

Predicates for generating predicate call cross-referencing diagrams in DOT format.

Availability:

`logtalk_load(diagrams(loader))`

Author: Paulo Moura

Version: 2:0:0

Date: 2014-01-01

Compilation flags:

`static, context_switching_calls`

Extends:

`public xref_diagram(dot)`

Remarks:

(none)

Inherited public predicates:

`all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 entity/1 entity/2 file/1 file/2 files/1 files/2
files/3 format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`entity_diagram`, `inheritance_diagram`, `uses_diagram`
object

1.15.31 `xref_diagram`(Format)

- Format - Graph language file format.

Predicates for generating predicate call cross-referencing diagrams.

Availability:

```
logtalk_load(diagrams(loader))
```

Author: Paulo Moura

Version: 2:85:0

Date: 2024-12-04

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public entity_diagram(Format)
```

Uses:

```
atom  
list  
logtalk  
modules_diagram_support  
os  
user
```

Remarks:

(none)

Inherited public predicates:

all_files/0 all_files/1 all_libraries/0 all_libraries/1 check_option/1 check_options/1
default_option/1 default_options/1 diagram_description/1 diagram_name_suffix/1 directories/2
directories/3 directory/1 directory/2 directory/3 file/1 file/2 files/1 files/2 files/3
format_object/1 libraries/1 libraries/2 libraries/3 library/1 library/2 option/2 option/3
rdirectory/1 rdirectory/2 rdirectory/3 rlibrary/1 rlibrary/2 valid_option/1 valid_options/1

- Public predicates
 - entity/2
 - entity/1
- Protected predicates
- Private predicates
 - included_predicate_/1
 - referenced_predicate_/1
 - external_predicate_/1
- Operators

Public predicates

entity/2

Creates a diagram for a single entity using the specified options.

Compilation flags:

static

Template:

entity(Entity,Options)

Mode and number of proofs:

entity(+entity_identifier,+list(compound)) - one

entity/1

Creates a diagram for a single entity using default options.

Compilation flags:

static

Template:

entity(Entity)

Mode and number of proofs:

entity(+entity_identifier) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

included_predicate_/1

Table of predicates already included in the diagram for the entity under processing.

Compilation flags:

dynamic

Template:

included_predicate_(Predicate)

Mode and number of proofs:

included_predicate_(?predicate_indicator) - zero_or_more

referenced_predicate_/1

Table of referenced predicates for the entity under processing.

Compilation flags:

dynamic

Template:

referenced_predicate_(Predicate)

Mode and number of proofs:

referenced_predicate_(?predicate_indicator) - zero_or_more

external_predicate_/1

Table of external predicate references for all the entities under processing.

Compilation flags:

dynamic

Template:

external_predicate_(Reference)

Mode and number of proofs:

external_predicate_(?compound) - zero_or_more

Operators

(none)

See also:

entity_diagram(Format), inheritance_diagram(Format), uses_diagram(Format)

1.16 dictionaries

object

1.16.1 avltree

AVL tree implementation of the dictionary protocol. Uses standard order to compare keys.

Availability:

logtalk_load(dictionaries(loader))

Author: R.A.O'Keefe, L.Damas, V.S.Costa, Glenn Burgess, Jiri Spitz, and Jan Wielemaker; Logtalk port and additional predicates by Paulo Moura

Version: 1:4:0
Date: 2021-04-12

Compilation flags:
static, context_switching_calls

Implements:
public dictionaryp

Extends:
public term

Uses:
list

Remarks:
(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 apply/4 as_curly_bracketed/2
as_dictionary/2 as_list/2 check/1 clone/3 clone/4 delete/4 delete_max/4 delete_min/4
depth/2 empty/1 ground/1 insert/4 intersection/2 intersection/3 keys/2 lookup/2 lookup/3
map/2 map/3 max/3 min/3 new/1 next/4 numbervars/1 numbervars/3 occurs/2 previous/4
singletons/2 size/2 subsumes/2 subterm/2 update/3 update/4 update/5 valid/1 values/2
variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

bintree, rbtree

object

1.16.2 bintree

Simple binary tree implementation of the dictionary protocol. Uses standard order to compare keys.

Availability:

```
logtalk_load(dictionaries(loader))
```

Author: Paulo Moura and Paul Fodor

Version: 2:11:1

Date: 2022-05-05

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public dictionaryp
```

Extends:

```
public term
```

Uses:

```
list
```

Remarks:

(none)

Inherited public predicates:

```
(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 apply/4 as_curly_bracketed/2  
as_dictionary/2 as_list/2 check/1 clone/3 clone/4 delete/4 delete_max/4 delete_min/4  
depth/2 empty/1 ground/1 insert/4 intersection/2 intersection/3 keys/2 lookup/2 lookup/3  
map/2 map/3 max/3 min/3 new/1 next/4 numbervars/1 numbervars/3 occurs/2 previous/4  
singletons/2 size/2 subsumes/2 subterm/2 update/3 update/4 update/5 valid/1 values/2  
variables/2 variant/2 varnumbers/2 varnumbers/3
```


- Public predicates
 - preorder/2
 - inorder/2
 - postorder/2
- Protected predicates
- Private predicates
- Operators

Public predicates

preorder/2

Preorder tree traversal.

Compilation flags:

static

Template:

preorder(Tree,List)

Mode and number of proofs:

preorder(@tree,-list) - one

inorder/2

Inorder tree traversal.

Compilation flags:

static

Template:

inorder(Tree,List)

Mode and number of proofs:

inorder(@tree,-list) - one

postorder/2

Postorder tree traversal.

Compilation flags:

static

Template:

postorder(Tree,List)

Mode and number of proofs:

postorder(@tree,-list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

avltree, rbtree

protocol

1.16.3 dictionaryp

Dictionary protocol.

Availability:

logtalk_load(dictionaries(loader))

Author: Paulo Moura

Version: 2:4:0

Date: 2024-10-02

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - as_dictionary/2
 - as_list/2
 - as_curly_bracketed/2
 - clone/3
 - clone/4
 - insert/4
 - delete/4
 - update/4
 - update/5
 - update/3
 - empty/1
 - lookup/3
 - lookup/2
 - intersection/2
 - intersection/3
 - previous/4
 - next/4
 - min/3
 - max/3
 - delete_min/4
 - delete_max/4
 - keys/2
 - values/2
 - map/2

- map/3
- apply/4
- size/2
- Protected predicates
- Private predicates
- Operators

Public predicates

`as_dictionary/2`

Converts a list of key-value pairs to a dictionary.

Compilation flags:

`static`

Template:

`as_dictionary(Pairs,Dictionary)`

Mode and number of proofs:

`as_dictionary(@list(pairs),-dictionary) - one`

`as_list/2`

Converts a dictionary to an ordered list (as per standard order) of key-value pairs.

Compilation flags:

`static`

Template:

`as_list(Dictionary,Pairs)`

Mode and number of proofs:

`as_list(@dictionary,-list(pairs)) - one`

as_curly_bracketed/2

Creates a curly-bracketed term representation of a dictionary.

Compilation flags:

static

Template:

as_curly_bracketed(Dictionary,Term)

Mode and number of proofs:

as_curly_bracketed(+dictionary,--term) - one

clone/3

Clones a dictionary using the same keys but with all values unbound and returning a list of all the pairs in the new clone.

Compilation flags:

static

Template:

clone(Dictionary,Clone,ClonePairs)

Mode and number of proofs:

clone(+dictionary,-dictionary,-list(pairs)) - one

clone/4

Clones a dictionary using the same keys but with all values unbound and returning the list of all pairs in the dictionary and in the clone.

Compilation flags:

static

Template:

clone(Dictionary,Pairs,Clone,ClonePairs)

Mode and number of proofs:

clone(+dictionary,-list(pairs),-dictionary,-list(pairs)) - one

insert/4

Inserts a key-value pair into a dictionary, returning the updated dictionary. When the key already exists, the associated value is updated.

Compilation flags:

static

Template:

insert(OldDictionary,Key,Value,NewDictionary)

Mode and number of proofs:

insert(+dictionary,+ground,@term,-dictionary) - one

delete/4

Deletes a matching key-value pair from a dictionary, returning the updated dictionary. Fails if it cannot find the key or if the key exists but the value does not unify.

Compilation flags:

static

Template:

delete(OldDictionary,Key,Value,NewDictionary)

Mode and number of proofs:

delete(+dictionary,@ground,?term,-dictionary) - zero_or_one

update/4

Updates the value associated with Key in a dictionary, returning the updated dictionary. Fails if it cannot find the key.

Compilation flags:

static

Template:

update(OldDictionary,Key,NewValue,NewDictionary)

Mode and number of proofs:

update(+dictionary,@ground,+term,-dictionary) - zero_or_one

update/5

Updates the value associated with a key in a dictionary, returning the updated dictionary. Fails if it cannot find the key or if the existing value does not unify.

Compilation flags:

static

Template:

update(OldDictionary,Key,OldValue,NewValue,NewDictionary)

Mode and number of proofs:

update(+dictionary,@ground,?term,+term,-dictionary) - zero_or_one

update/3

Updates the key-value pairs in a dictionary, returning the updated dictionary. Fails if it cannot find one of the keys.

Compilation flags:

static

Template:

update(OldDictionary,Pairs,NewDictionary)

Mode and number of proofs:

update(+dictionary,@list(pair),-dictionary) - zero_or_one

empty/1

True iff the dictionary is empty.

Compilation flags:

static

Template:

empty(Dictionary)

Mode and number of proofs:

empty(@dictionary) - zero_or_one

lookup/3

Lookups a matching key-value pair from a dictionary. Fails if no match is found.

Compilation flags:

static

Template:

lookup(Key,Value,Dictionary)

Mode and number of proofs:

lookup(+ground,?term,@dictionary) - zero_or_one

lookup(-ground,?term,@dictionary) - zero_or_more

lookup/2

Lookups all matching key-value pairs from a dictionary. Fails if it cannot find one of the keys or if a value for a key does not unify.

Compilation flags:

static

Template:

lookup(Pairs,Dictionary)

Mode and number of proofs:

lookup(+list(pair),@dictionary) - zero_or_one

intersection/2

True iff the values of the dictionaries common keys unify. Trivially true when there are no common keys.

Compilation flags:

static

Template:

intersection(Dictionary1,Dictionary2)

Mode and number of proofs:

intersection(+dictionary,+dictionary) - zero_or_one

intersection/3

Returns the (possibly empty) intersection between two dictionaries when the values of their common keys unify.

Compilation flags:

static

Template:

intersection(Dictionary1,Dictionary2,Intersection)

Mode and number of proofs:

intersection(+dictionary,+dictionary,-dictionary) - zero_or_one

previous/4

Returns the previous pair in a dictionary given a key. Fails if there is no previous pair.

Compilation flags:

static

Template:

previous(Dictionary,Key,Previous,Value)

Mode and number of proofs:

previous(+dictionary,+key,-key,-value) - zero_or_one

next/4

Returns the next pair in a dictionary given a key. Fails if there is no next pair.

Compilation flags:

static

Template:

next(Dictionary,Key,Next,Value)

Mode and number of proofs:

next(+dictionary,+key,-key,-value) - zero_or_one

min/3

Returns the pair with the minimum key (as per standard order) in a dictionary. Fails if the dictionary is empty.

Compilation flags:

static

Template:

min(Dictionary,Key,Value)

Mode and number of proofs:

min(+dictionary,-key,-value) - zero_or_one

max/3

Returns the pair with the maximum key (as per standard order) in a dictionary. Fails if the dictionary is empty.

Compilation flags:

static

Template:

max(Dictionary,Key,Value)

Mode and number of proofs:

max(+dictionary,-key,-value) - zero_or_one

delete_min/4

Deletes the pair with the minimum key (as per standard order) from a dictionary, returning the deleted pair and the updated dictionary. Fails if the dictionary is empty.

Compilation flags:

static

Template:

delete_min(OldDictionary,Key,Value,NewDictionary)

Mode and number of proofs:

delete_min(+dictionary,-key,-value,-dictionary) - zero_or_one

delete_max/4

Deletes the pair with the maximum key (as per standard order) from a dictionary, returning the deleted pair and the updated dictionary. Fails if the dictionary is empty.

Compilation flags:

static

Template:

delete_max(OldDictionary,Key,Value,NewDictionary)

Mode and number of proofs:

`delete_max(+dictionary,-key,-value,-dictionary) - zero_or_one`

keys/2

Returns a list with all the dictionary keys in ascending order (as per standard order).

Compilation flags:

`static`

Template:

`keys(Dictionary,Keys)`

Mode and number of proofs:

`keys(@dictionary,-list) - one`

values/2

Returns a list with all the dictionary values in ascending order of the keys (as per standard order).

Compilation flags:

`static`

Template:

`values(Dictionary,Values)`

Mode and number of proofs:

`values(@dictionary,-list) - one`

map/2

Maps a closure over each dictionary key-value pair. Fails if the mapped closure attempts to modify the keys.

Compilation flags:

`static`

Template:

```
map(Closure,Dictionary)
```

Meta-predicate template:

```
map(1,*)
```

Mode and number of proofs:

```
map(@callable,+dictionary) - zero_or_more
```

map/3

Maps a closure over each dictionary key-value pair, returning the new dictionary. Fails if the mapped closure attempts to modify the keys.

Compilation flags:

```
static
```

Template:

```
map(Closure,OldDictionary,NewDictionary)
```

Meta-predicate template:

```
map(2,*,*)
```

Mode and number of proofs:

```
map(@callable,+dictionary,-dictionary) - zero_or_more
```

apply/4

Applies a closure to a specific key-value pair, returning the new dictionary. Fails if the key cannot be found or if the mapped closure attempts to modify the key.

Compilation flags:

```
static
```

Template:

```
apply(Closure,OldDictionary,Key,NewDictionary)
```

Meta-predicate template:

```
apply(2,*,*,*)
```

Mode and number of proofs:

```
apply(+callable,+dictionary,+key,-dictionary) - zero_or_one
```

size/2

Number of dictionary entries.

Compilation flags:

static

Template:

size(Dictionary,Size)

Mode and number of proofs:

size(@dictionary,?integer) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

avltree, bintree, rbtree

object

1.16.4 rbtree

Red-Black tree implementation of the dictionary protocol. Uses standard order to compare keys.

Availability:

logtalk_load(dictionaries(loader))

Author: Vitor Santos Costa; Logtalk port and additional predicates by Paulo Moura.

Version: 1:9:0

Date: 2021-04-12

Compilation flags:

static, context_switching_calls

Implements:

public dictionaryp

Extends:

public term

Remarks:

(none)

Inherited public predicates:

(<)/2 (:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 apply/4 as_curly_bracketed/2
 as_dictionary/2 as_list/2 check/1 clone/3 clone/4 delete/4 delete_max/4 delete_min/4
 depth/2 empty/1 ground/1 insert/4 intersection/2 intersection/3 keys/2 lookup/2 lookup/3
 map/2 map/3 max/3 min/3 new/1 next/4 numbervars/1 numbervars/3 occurs/2 previous/4
 singletons/2 size/2 subsumes/2 subterm/2 update/3 update/4 update/5 valid/1 values/2
 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
 - partial_map/4
- Protected predicates
- Private predicates
- Operators

Public predicates

partial_map/4

Applies a closure to the tree pairs identified by a set of keys.

Compilation flags:

static

Template:

partial_map(Tree,Keys,Closure,NewTree)

Meta-predicate template:

partial_map(*,*,2,*)

Mode and number of proofs:

partial_map(+tree,+list,@closure,-tree) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

avltree, bintree

1.17 dif

object

1.17.1 dif

Provides dif/2 and derived predicates.

Availability:

`logtalk_load(dif(loader))`

Author: Paulo Moura

Version: 1:3:0

Date: 2023-10-02

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

- Supported backend Prolog systems: B-Prolog, ECLiPSe, SICStus Prolog, SWI-Prolog, Trealla Prolog, and YAP.

Inherited public predicates:

(none)

- Public predicates
 - dif/2
 - dif/1
- Protected predicates
- Private predicates
- Operators

Public predicates

dif/2

Sets a constraint that is true iff the two terms are different.

Compilation flags:

static

Template:

dif(Term1,Term2)

Mode and number of proofs:

dif(+term,+term) - zero_or_one

dif/1

Sets a set of constraints that are true iff all terms in a list are different.

Compilation flags:

static

Template:

dif(Terms)

Mode and number of proofs:

dif(+list(term)) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.18 doclet

object

1.18.1 doclet

Utility object to help automate (re)generating documentation for a project.

Availability:

`logtalk_load(doclet(loader))`

Author: Paulo Moura

Version: 0:5:0

Date: 2017-01-05

Compilation flags:

`static, context_switching_calls`

Provides:

`logtalk::message_tokens//2`

Uses:

`logtalk`

`os`

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - update/0
 - doc_goal/1
 - shell_command/1
- Protected predicates
- Private predicates
- Operators

Public predicates

update/0

Updates the project documentation, first by calling a sequence of goals and second by executing a sequence of shell commands. Fails if any goal or shell command fails.

Compilation flags:

static

Mode and number of proofs:

update - zero_or_one

doc_goal/1

Table of goals, typically using the diagrams and the lgt doc tools, used to generate the documentation. Goals are called in the order they are defined and in the context of the user pseudo-object.

Compilation flags:

static

Template:

doc_goal(Goal)

Mode and number of proofs:

doc_goal(?callable) - one_or_more

shell_command/1

Table of shell commands to convert intermediate documentation files into user-friendly documentation. Commands are executed in the order they are defined.

Compilation flags:

static

Template:

shell_command(Command)

Mode and number of proofs:

shell_command(?atom) - one_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

lgtdocp, diagram(Format)

1.19 edcg

object

1.19.1 edcg

Multiple hidden parameters: an extension to Prolog's DCG notation. Ported to Logtalk as a hook object.

Availability:

logtalk_load(edcg(loader))

Author: Peter Van Roy; adapted to Logtalk by Paulo Moura.

Version: 1:4:2
Date: 2020-04-08

Copyright: Copyright (C) 1992 Peter Van Roy
License: MIT

Compilation flags:
static, context_switching_calls

Implements:
public expanding
Provides:
logtalk::message_tokens//2
Uses:
list
logtalk

Remarks:

- Usage: Compile source files with objects (or categories) defining EDCGs using the compiler option `hook(edcg)`.

Inherited public predicates:
goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
 - pred_info/3
 - acc_info/7
 - acc_info/5
 - pass_info/2
 - pass_info/1
- Operators
 - op(1200,xfx,-->>)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

pred_info/3

Declares predicates that have the listed hidden parameters.

Compilation flags:

dynamic

Template:

pred_info(Name,Arity,HiddenParameters)

Mode and number of proofs:

pred_info(?atom,?integer,?list(atom)) - zero_or_more

acc_info/7

Long form for declaring accumulators.

Compilation flags:

dynamic

Template:

acc_info(Accumulator,Term,Left,Right,Joiner,LStart,RStart)

Mode and number of proofs:

acc_info(?atom,?term,?term,?term,?callable,?term,?term) - zero_or_more

acc_info/5

Short form for declaring accumulators.

Compilation flags:

dynamic

Template:

acc_info(Accumulator,Term,Left,Right,Joiner)

Mode and number of proofs:

acc_info(?atom,?term,?term,?term,?callable) - zero_or_more

pass_info/2

Long form for declaring passed arguments. Passed arguments are conceptually the same as accumulators with =/2 as the joiner function.

Compilation flags:

dynamic

Template:

pass_info(Argument,PStart)

Mode and number of proofs:

pass_info(?atom,?term) - zero_or_more

pass_info/1

Short form for declaring passed arguments. Passed arguments are conceptually the same as accumulators with =/2 as the joiner function.

Compilation flags:

dynamic

Template:

pass_info(Argument)

Mode and number of proofs:

pass_info(?atom) - zero_or_more

Operators

`op(1200,xfx,-->>)`

Scope:

public

1.20 events

object

1.20.1 after_event_registry

After events registry predicates.

Availability:

`logtalk_load(events(loader))`

Author: Paulo Moura

Version: 1:1:0

Date: 2009-10-08

Compilation flags:

`static, context_switching_calls, events`

Implements:

`public event_registry`

Remarks:

(none)

Inherited public predicates:

`del_monitors/0 del_monitors/4 monitor/1 monitor/4 monitored/1 monitors/1 set_monitor/4`

- Public predicates
- Protected predicates
- Private predicates

- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`before_event_registry`, `monitorp`
object

1.20.2 `before_event_registry`

Before events registry predicates.

Availability:

`logtalk_load(events(loader))`

Author: Paulo Moura

Version: 1:1:0

Date: 2009-10-08

Compilation flags:

`static`, `context_switching_calls`, `events`

Implements:

`public event_registryp`

Remarks:

(none)

Inherited public predicates:

del_monitors/0 del_monitors/4 monitor/1 monitor/4 monitored/1 monitors/1 set_monitor/4

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

after_event_registry, monitorp

object

1.20.3 event_registry

Before and after events registry predicates.

Availability:

logtalk_load(events(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2009-10-08

Compilation flags:

static, context_switching_calls, events

Implements:

public event_registryp

Remarks:

(none)

Inherited public predicates:

del_monitors/0 del_monitors/4 monitor/1 monitor/4 monitored/1 monitors/1 set_monitor/4

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.20.4 event_registryp

Event registry protocol.

Availability:

logtalk_load(events(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2009-10-08

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - monitors/1
 - monitor/1
 - monitored/1
 - monitor/4
 - set_monitor/4
 - del_monitors/4
 - del_monitors/0
- Protected predicates
- Private predicates
- Operators

Public predicates

monitors/1

Returns a list of all current monitors.

Compilation flags:

static

Template:

monitors(Monitors)

Mode and number of proofs:

monitors(-list(object_identifier)) - one

monitor/1

Monitor is an object playing the role of a monitor.

Compilation flags:

static

Template:

monitor(Monitor)

Mode and number of proofs:

monitor(-object_identifier) - zero_or_more

monitor(+object_identifier) - zero_or_one

monitored/1

Returns a list of all currently monitored objects.

Compilation flags:

static

Template:

monitored(Objects)

Mode and number of proofs:

monitored(-list(object_identifier)) - one

monitor/4

True if the arguments describe a currently defined monitored event.

Compilation flags:

static

Template:

monitor(Object,Message,Sender,Monitor)

Mode and number of proofs:

monitor(?object_identifier,?nonvar,?object_identifier,?object_identifier) - zero_or_more

set_monitor/4

Sets a monitor for the set of matching events.

Compilation flags:

static

Template:

set_monitor(Object,Message,Sender,Monitor)

Mode and number of proofs:

set_monitor(?object_identifier,?nonvar,?object_identifier,+object_identifier) - zero_or_one

del_monitors/4

Deletes all matching monitored events.

Compilation flags:

static

Template:

del_monitors(Object,Message,Sender,Monitor)

Mode and number of proofs:

del_monitors(?object_identifier,?nonvar,?object_identifier,?object_identifier) - one

del_monitors/0

Deletes all monitored events.

Compilation flags:

static

Mode and number of proofs:

del_monitors - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

event_registry, monitorp
category

1.20.5 monitor

Monitor predicates.

Availability:

logtalk_load(events(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2019-03-08

Compilation flags:

static, events

Implements:

public monitorp

Remarks:

(none)

Inherited public predicates:

activate_monitor/0 del_spy_points/4 monitor_activated/0 reset_monitor/0 set_spy_point/4
spy_point/4 suspend_monitor/0

- Public predicates
- Protected predicates
- Private predicates
 - spy_point_/4
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

spy_point_/4

Stores current spy points.

Compilation flags:

dynamic

Template:

spy_point_(Event,Object,Message,Sender)

Mode and number of proofs:

spy_point_(?event,?object,?callable,?object) - zero_or_more

Operators

(none)

protocol

1.20.6 monitorp

Monitor protocol.

Availability:

```
logtalk_load(events(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2000-07-24

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - monitor_activated/0
 - activate_monitor/0
 - suspend_monitor/0
 - reset_monitor/0
 - spy_point/4
 - set_spy_point/4
 - del_spy_points/4
- Protected predicates
- Private predicates
- Operators

Public predicates

monitor_activated/0

True if monitor is currently active.

Compilation flags:

static

Mode and number of proofs:

monitor_activated - zero_or_one

activate_monitor/0

Activates all spy points and start monitoring.

Compilation flags:

static

Mode and number of proofs:

activate_monitor - one

suspend_monitor/0

Suspends monitoring, deactivating all spy points.

Compilation flags:

static

Mode and number of proofs:

suspend_monitor - one

reset_monitor/0

Resets monitor, deactivating and deleting all spy points.

Compilation flags:

static

Mode and number of proofs:

reset_monitor - one

spy_point/4

Current spy point.

Compilation flags:

static

Template:

spy_point(Event, Object, Message, Sender)

Mode and number of proofs:

spy_point(?event, ?object, ?callable, ?object) - zero_or_more

set_spy_point/4

Sets a spy point.

Compilation flags:

static

Template:

set_spy_point(Event, Object, Message, Sender)

Mode and number of proofs:

set_spy_point(?event, ?object, ?callable, ?object) - one

del_spy_points/4

Deletes all matching spy points.

Compilation flags:

static

Template:

del_spy_points(Event, Object, Message, Sender)

Mode and number of proofs:

del_spy_points(@event, @object, @callable, @object) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

monitor, event_registry

1.21 expand_library_alias_paths

object

1.21.1 expand_library_alias_paths

Hook object for expanding library alias paths in logtalk_library_path/2 facts when compiling a source file.

Availability:

logtalk_load(expand_library_alias_paths(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2018-04-12

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Uses:

logtalk

os

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.22 expecteds

object

1.22.1 either

Types and predicates for extended type-checking and handling of expected terms.

Availability:

`logtalk_load(expecteds(loader))`

Author: Paulo Moura

Version: 0:7:0

Date: 2021-01-03

Compilation flags:

`static, context_switching_calls`

Provides:

`type::type/1`

`type::check/2`

`arbitrary::arbitrary/1`

`arbitrary::arbitrary/2`

Uses:

`expected`

`expected(Expected)`

`random`

`type`

Remarks:

- Type-checking support: Defines a `either(ValueType, ErrorType)` type for checking expected terms where the value and error terms must be of the given types.
- QuickCheck support: Defines clauses for the `type::arbitrary/1-2` predicates to allow generating random values for the `either(ValueType, ErrorType)` type.

Inherited public predicates:

(none)

- Public predicates
 - expecteds/2
 - unexpecteds/2
 - partition/3
- Protected predicates
- Private predicates
- Operators

Public predicates

expecteds/2

Returns the values stored in the expected terms that hold a value.

Compilation flags:

static

Template:

expecteds(Expecteds,Values)

Mode and number of proofs:

expecteds(+list(expected),-list) - one

unexpecteds/2

Returns the errors stored in the expected terms that hold an error.

Compilation flags:

static

Template:

unexpecteds(Expecteds,Errors)

Mode and number of proofs:

unexpecteds(+list(expected),-list) - one

partition/3

Retrieves and partitions the values and errors hold by the expected terms.

Compilation flags:

static

Template:

partition(Expecteds,Values,Errors)

Mode and number of proofs:

partition(+list(expected),-list,-list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

expected, expected(Expected), type, arbitrary

object

1.22.2 expected

Constructors for expected terms. An expected term contains either a value or an error. Expected terms should be regarded as opaque terms and always used with the expected/1 object by passing the expected term as a parameter.

Availability:

logtalk_load(expecteds(loader))

Author: Paulo Moura

Version: 2:1:0

Date: 2021-01-03

Compilation flags:

static, context_switching_calls

Provides:

type::type/1
type::check/2

Remarks:

- Type-checking support: This object also defines a type expected for use with the type library object.

Inherited public predicates:

(none)

- Public predicates
 - of_unexpected/2
 - of_expected/2
 - from_goal/4
 - from_goal/3
 - from_goal/2
 - from_generator/4
 - from_generator/3
 - from_generator/2
- Protected predicates
- Private predicates
- Operators

Public predicates

of_unexpected/2

Constructs an expected term from an error that represent that the expected value is missing.

Compilation flags:

static

Template:

of_unexpected(Error,Expected)

Mode and number of proofs:

of_unexpected(@term,--nonvar) - one

of_expected/2

Constructs an expected term from an expected value.

Compilation flags:

static

Template:

of_expected(Value,Expected)

Mode and number of proofs:

of_expected(@term,--nonvar) - one

from_goal/4

Constructs an expected term holding a value bound by calling the given goal. Otherwise returns an expected term with the unexpected goal error or failure represented by the Error argument.

Compilation flags:

static

Template:

from_goal(Goal,Value,Error,Expected)

Meta-predicate template:

from_goal(0,*,*,*)

Mode and number of proofs:

from_goal(+callable,--term,@term,--nonvar) - one

from_goal/3

Constructs an expected term holding a value bound by calling the given goal. Otherwise returns an expected term with the unexpected goal error or the atom fail representing the unexpected failure.

Compilation flags:

static

Template:

from_goal(Goal,Value,Expected)

Meta-predicate template:

from_goal(0,*,*)

Mode and number of proofs:

from_goal(+callable,--term,--nonvar) - one

from_goal/2

Constructs an expected term holding a value bound by calling the given closure. Otherwise returns an expected term holding the unexpected closure error or the atom fail representing the unexpected failure.

Compilation flags:

static

Template:

from_goal(Closure,Expected)

Meta-predicate template:

from_goal(1,*)

Mode and number of proofs:

from_goal(+callable,--nonvar) - one

from_generator/4

Constructs expected terms with the values generated by calling the given goal. On goal error or failure, returns an expected term with the unexpected goal error or failure represented by the Error argument.

Compilation flags:

static

Template:

```
from_generator(Goal,Value,Error,Expected)
```

Meta-predicate template:

```
from_generator(0,*,*,*)
```

Mode and number of proofs:

```
from_generator(+callable,--term,@term,--nonvar) - one_or_more
```

`from_generator/3`

Constructs expected terms with the values generated by calling the given goal. On goal error or failure, returns an expected term with, respectively, the unexpected goal error or the atom fail representing the unexpected goal failure.

Compilation flags:

```
static
```

Template:

```
from_generator(Goal,Value,Expected)
```

Meta-predicate template:

```
from_generator(0,*,*)
```

Mode and number of proofs:

```
from_generator(+callable,--term,--nonvar) - one_or_more
```

`from_generator/2`

Constructs expected terms with the values generated by calling the given closure. On closure error or failure, returns an expected term with, respectively, the unexpected closure error or the atom fail representing the unexpected closure failure.

Compilation flags:

```
static
```

Template:

```
from_generator(Closure,Expected)
```

Meta-predicate template:

```
from_generator(1,*)
```

Mode and number of proofs:

```
from_generator(+callable,--nonvar) - one_or_more
```

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`expected(Expected)`, type

object

1.22.3 `expected(Expected)`

Expected term predicates. Requires passing an expected term (constructed using the expected object predicates) as a parameter.

Availability:

`logtalk_load(expecteds(loader))`

Author: Paulo Moura

Version: 1:5:0

Date: 2020-01-06

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - `is_expected/0`
 - `is_unexpected/0`
 - `if_expected/1`
 - `if_unexpected/1`
 - `if_expected_or_else/2`
 - `unexpected/1`
 - `expected/1`
 - `map/2`
 - `flat_map/2`
 - `either/3`
 - `or_else/2`
 - `or_else_get/2`
 - `or_else_call/2`
 - `or_else_throw/1`
 - `or_else_fail/1`
- Protected predicates
- Private predicates
- Operators

Public predicates

`is_expected/0`

True if the `expected` term holds a value. See also the `if_expected/1` predicate.

Compilation flags:

`static`

Mode and number of proofs:

`is_expected - zero_or_one`

is_unexpected/0

True if the expected term holds an error. See also the if_unexpected/1 predicate.

Compilation flags:

static

Mode and number of proofs:

is_unexpected - zero_or_one

if_expected/1

Applies a closure when the expected term holds a value using the value as argument. Succeeds otherwise.

Compilation flags:

static

Template:

if_expected(Closure)

Meta-predicate template:

if_expected(1)

Mode and number of proofs:

if_expected(+callable) - zero_or_more

if_unexpected/1

Applies a closure when the expected term holds an error using the error as argument. Succeeds otherwise. Can be used to throw the exception hold by the expected term by calling it the atom throw.

Compilation flags:

static

Template:

if_unexpected(Closure)

Meta-predicate template:

if_unexpected(1)

Mode and number of proofs:

`if_unexpected(+callable) - zero_or_more`

`if_expected_or_else/2`

Applies either `ExpectedClosure` or `UnexpectedClosure` depending on the expected term holding a value or an error.

Compilation flags:

`static`

Template:

`if_expected_or_else(ExpectedClosure,UnexpectedClosure)`

Meta-predicate template:

`if_expected_or_else(1,1)`

Mode and number of proofs:

`if_expected_or_else(+callable,+callable) - zero_or_more`

`unexpected/1`

Returns the error hold by the expected term. Throws an error otherwise.

Compilation flags:

`static`

Template:

`unexpected(Error)`

Mode and number of proofs:

`unexpected(--term) - one_or_error`

Exceptions:

Expected term holds a value:

`existence_error(unexpected_error,Expected)`

expected/1

Returns the value hold by the expected term. Throws an error otherwise.

Compilation flags:

static

Template:

expected(Value)

Mode and number of proofs:

expected(--term) - one_or_error

Exceptions:

Expected term holds an error:

existence_error(expected_value,Expected)

map/2

When the expected term does not hold an error and mapping a closure with the expected value and the new value as additional arguments is successful, returns an expected term with the new value. Otherwise returns the same expected term.

Compilation flags:

static

Template:

map(Closure,NewExpected)

Meta-predicate template:

map(2,*)

Mode and number of proofs:

map(+callable,--nonvar) - one

`flat_map/2`

When the expected term does not hold an error and mapping a closure with the expected value and the new expected term as additional arguments is successful, returns the new expected term. Otherwise returns the same expected term.

Compilation flags:

`static`

Template:

`flat_map(Closure,NewExpected)`

Meta-predicate template:

`flat_map(2,*)`

Mode and number of proofs:

`flat_map(+callable,--nonvar) - one`

`either/3`

Applies either `ExpectedClosure` if the expected term holds a value or `UnexpectedClosure` if the expected term holds an error. Returns a new expected term if the applied closure is successful. Otherwise returns the same expected term.

Compilation flags:

`static`

Template:

`either(ExpectedClosure,UnexpectedClosure,NewExpected)`

Meta-predicate template:

`either(2,2,*)`

Mode and number of proofs:

`either(+callable,+callable,--nonvar) - one`

`or_else/2`

Returns the value hold by the expected term if it does not hold an error or the given default term if the expected term holds an error.

Compilation flags:

`static`

Template:

`or_else(Value,Default)`

Mode and number of proofs:

`or_else(--term,@term) - one`

`or_else_get/2`

Returns the value hold by the expected term if it does not hold an error. Otherwise applies a closure to compute the expected value. Throws an error when the expected term holds an error and a value cannot be computed.

Compilation flags:

`static`

Template:

`or_else_get(Value,Closure)`

Meta-predicate template:

`or_else_get(*,1)`

Mode and number of proofs:

`or_else_get(--term,+callable) - one_or_error`

Exceptions:

Expected term holds an unexpected error and an expected value cannot be computed:

`existence_error(expected_value,Expected)`

`or_else_call/2`

Returns the value hold by the expected term if it does not hold an error. Calls a goal deterministically otherwise.

Compilation flags:

`static`

Template:

`or_else_call(Value,Goal)`

Meta-predicate template:

`or_else_call(*,0)`

Mode and number of proofs:

`or_else_call(--term,+callable) - zero_or_one`

`or_else_throw/1`

Returns the value hold by the expected term if present. Throws the error hold by the expected term as an exception otherwise.

Compilation flags:

`static`

Template:

`or_else_throw(Value)`

Mode and number of proofs:

`or_else_throw(--term) - one_or_error`

`or_else_fail/1`

Returns the value hold by the expected term if it does not hold an error. Fails otherwise. Usually called to skip over expected terms holding errors.

Compilation flags:

`static`

Template:

`or_else_fail(Value)`

Mode and number of proofs:

`or_else_fail(--term) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`expected`

1.23 fcube

object

1.23.1 fcube

FCube: An Efficient Prover for Intuitionistic Propositional Logic.

Availability:

`logtalk_load(fcube(loader))`

Author: Mauro Ferrari, Camillo Fiorentini, Guido Fiorino; ported to Logtalk by Paulo Moura.

Version: 5:0:1

Date: 2024-03-14

Copyright: Copyright 2012 Mauro Ferrari, Camillo Fiorentini, Guido Fiorino; Copyright 2020-2024 Paulo Moura

License: GPL-2.0-or-later

Compilation flags:

`static, context_switching_calls`

Uses:

- integer
- list
- os
- set
- user

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - gnu/0
 - fcube/0
 - decide/1
 - decide/2
- Protected predicates
- Private predicates
- Operators
 - op(1200,xfy,<=>)
 - op(1110,xfy,=>)
 - op(1000,xfy,&&&)
 - op(500,fy,~)
 - op(1100,xfy,v)

Public predicates

gnu/0

Prints banner with copyright and license information.

Compilation flags:

static

Mode and number of proofs:

gnu - one

fcube/0

Reads a formula and applies the prover to it, printing its counter-model.

Compilation flags:

static

Mode and number of proofs:

fcube - one

decide/1

Applies the prover to the given formula and prints its counter-model.

Compilation flags:

static

Template:

decide(Formula)

Mode and number of proofs:

decide(++compound) - one

decide/2

Applies the prover to the given formula and returns its counter-model.

Compilation flags:

static

Template:

decide(Formula,CounterModel)

Mode and number of proofs:

decide(++compound,--compound) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

op(1200,xfy,<=>)

Scope:

public

op(1110,xfy,=>)

Scope:

public

op(1000,xfy,&&)

Scope:

public

op(500,fy,~)

Scope:

public

op(1100,xfy,v)

Scope:

public

1.24 flags

category

1.24.1 flags

Implementation of persistent object flags.

Availability:

```
logtalk_load(flags(loader))
```

Author: Theofrastos Mantadelis

Version: 1:0:0

Date: 2010-11-27

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - get_flag_value/2
 - set_flag_value/2
 - set_flag_value/3
 - reset_flags/0
 - reset_flags/1
 - flag_groups/1
 - flag_group_chk/1
 - print_flags/0
 - print_flags/1
 - defined_flag/6

- built_in_flag/2
- Protected predicates
 - unsafe_set_flag_value/2
 - define_flag/1
 - define_flag/2
- Private predicates
 - defined_flag_/6
 - flag_value_/2
 - validate/3
 - validate_type/1
 - is_validator/1
- Operators

Public predicates

get_flag_value/2

Gets or tests the value of a flag.

Compilation flags:

static

Template:

get_flag_value(Flag,Value)

Mode and number of proofs:

get_flag_value(+atom,?nonvar) - zero_or_one

set_flag_value/2

Sets the value of a flag.

Compilation flags:

static

Template:

set_flag_value(Flag,NewValue)

Mode and number of proofs:

`set_flag_value(+atom,@nonvar) - one`

`set_flag_value/3`

Sets the value of a flag, returning the old value.

Compilation flags:

`static`

Template:

`set_flag_value(Flag,OldValue,NewValue)`

Mode and number of proofs:

`set_flag_value(+atom,?nonvar,@nonvar) - one`

`reset_flags/0`

Resets all flags to their default values.

Compilation flags:

`static`

Mode and number of proofs:

`reset_flags - one`

`reset_flags/1`

Resets all flags in a group to their default values.

Compilation flags:

`static`

Template:

`reset_flags(Group)`

Mode and number of proofs:

reset_flags(+atom) - one

flag_groups/1

Returns a list of all flag groups.

Compilation flags:

static

Template:

flag_groups(Groups)

Mode and number of proofs:

flag_groups(-list(atom)) - one

flag_group_chk/1

Checks if a given atom is a flag group.

Compilation flags:

static

Template:

flag_group_chk(Group)

Mode and number of proofs:

flag_group_chk(+atom) - zero_or_one

print_flags/0

Prints a listing of all flags.

Compilation flags:

static

Mode and number of proofs:

print_flags - one

print_flags/1

Prints a listing of all flags in a group.

Compilation flags:

static

Template:

print_flags(Group)

Mode and number of proofs:

print_flags(+atom) - one

defined_flag/6

Gets or test the existing (visible) flag definitions.

Compilation flags:

static

Template:

defined_flag(Flag,Group,Type,DefaultValue,Description,Access)

Mode and number of proofs:

defined_flag(?atom,?atom,?nonvar,?nonvar,?atom,?atom) - zero_or_more

built_in_flag/2

True if the argument is a built-in flag type with the specified default value.

Compilation flags:

static

Template:

```
built_in_flag(Type,DefaultValue)
```

Mode and number of proofs:

```
built_in_flag(?atom,?nonvar) - zero_or_more
```

Protected predicates

`unsafe_set_flag_value/2`

Sets the value of a flag without performing any validation checks.

Compilation flags:

```
static
```

Template:

```
unsafe_set_flag_value(Flag,NewValue)
```

Mode and number of proofs:

```
unsafe_set_flag_value(+atom,@nonvar) - one
```

`define_flag/1`

Defines a new flag using default options.

Compilation flags:

```
static
```

Template:

```
define_flag(Flag)
```

Mode and number of proofs:

```
define_flag(+atom) - one
```

`define_flag/2`

Defines a new flag using a given set of options (for example, `[group(general), type(nonvar), default(true), description(Flag), access(read_write)]`).

Compilation flags:

`static`

Template:

`define_flag(Flag,Options)`

Mode and number of proofs:

`define_flag(+atom,@list) - one`

Private predicates

`defined_flag_/6`

Gets or test the existing flag definitions.

Compilation flags:

`dynamic`

Template:

`defined_flag_(Flag,Group,Type,DefaultValue,Description,Access)`

Mode and number of proofs:

`defined_flag_(?atom,?atom,?nonvar,?nonvar,?atom,?atom) - zero_or_more`

`flag_value_/2`

Table of flag values.

Compilation flags:

`dynamic`

Template:

`flag_value_(Flag,Value)`

Mode and number of proofs:

flag_value_(?atom,?nonvar) - zero_or_more

validate/3

Compilation flags:

static

validate_type/1

Compilation flags:

static

is_validator/1

Compilation flags:

static

Operators

(none)

protocol

1.24.2 flags_validator

Flag validation protocol. Must be implemented by validator objects.

Availability:

logtalk_load(flags(loader))

Author: Theofrastos Mantadelis

Version: 1:0:0

Date: 2010-11-27

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - print_flags/0
 - validate/1
- Protected predicates
- Private predicates
- Operators

Public predicates

print_flags/0

Validates the validator object itself.

Compilation flags:

static

Mode and number of proofs:

print_flags - zero_or_one

validate/1

Validates a flag value.

Compilation flags:

static

Template:

validate(Value)

Mode and number of proofs:

validate(@term) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.25 format

object

1.25.1 format

Formatted output predicates.

Availability:

logtalk_load(format(loader))

Author: Paulo Moura

Version: 1:2:0

Date: 2023-10-02

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - format/3
 - format/2
- Protected predicates
- Private predicates
- Operators

Public predicates

format/3

Writes a list of arguments after a format specification to the specified output stream.

Compilation flags:

static

Template:

format(Stream,Format,Arguments)

Mode and number of proofs:

format(@stream_or_alias,+atom,@list) - zero_or_one

format(@stream_or_alias,+list(character_code),@list) - zero_or_one

format(@stream_or_alias,+list(character),@list) - zero_or_one

format/2

Writes a list of arguments after a format specification to the current output stream.

Compilation flags:

static

Template:

format(Format,Arguments)

Mode and number of proofs:

format(+atom,@list) - zero_or_one

format(+list(character_code),@list) - zero_or_one

format(+list(character),@list) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.26 genint

object

1.26.1 genint

Global object for generating increasing non-negative integers for named counters. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

logtalk_load(genint(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2022-07-21

Compilation flags:

static, context_switching_calls

Imports:

public genint_core

Remarks:

(none)

Inherited public predicates:

genint/2 reset_genint/0 reset_genint/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.26.2 genint_core

Predicates for generating increasing non-negative integers. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

```
logtalk_load(genint(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-07-26

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - reset_genint/0
 - reset_genint/1
 - genint/2
- Protected predicates
- Private predicates
 - counter_/2
- Operators

Public predicates

reset_genint/0

Resets all counters.

Compilation flags:

static, synchronized

Mode and number of proofs:

reset_genint - one

reset_genint/1

Resets the given counter.

Compilation flags:

static, synchronized

Template:

reset_genint(Counter)

Mode and number of proofs:

reset_genint(+atom) - one

genint/2

Returns the next integer for a given counter.

Compilation flags:

static, synchronized

Template:

genint(Counter,Integer)

Mode and number of proofs:

genint(+atom,-non_negative_integer) - one

Protected predicates

(none)

Private predicates

counter_/2

Table of current state of counters.

Compilation flags:

dynamic

Template:

counter_(Counter,Latest)

Mode and number of proofs:

counter_(?atom,?non_negative_integer) - zero_or_more

Operators

(none)

1.27 gensym

object

1.27.1 gensym

Global object for generating unique atoms. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

logtalk_load(gensym(loader))

Author: Paulo Moura

Version: 2:0:0

Date: 2022-07-21

Compilation flags:

static, context_switching_calls

Imports:

```
public gensym_core
```

Remarks:

(none)

Inherited public predicates:

```
gensym/2 reset_gensym/0 reset_gensym/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.27.2 gensym_core

Predicates for generating unique atoms. Protocol based on the gensym module of SWI-Prolog. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

```
logtalk_load(gensym(loader))
```

Author: Paulo Moura

Version: 2:1:0

Date: 2022-07-26

Compilation flags:
static

Dependencies:
(none)

Remarks:
(none)

Inherited public predicates:
(none)

- Public predicates
 - reset_gensym/0
 - reset_gensym/1
 - gensym/2
- Protected predicates
- Private predicates
 - base_/2
- Operators

Public predicates

reset_gensym/0

Resets the generator counter for all bases.

Compilation flags:
static, synchronized

Mode and number of proofs:
reset_gensym - one

reset_gensym/1

Resets the generator counter for a given base.

Compilation flags:

static, synchronized

Template:

reset_gensym(Base)

Mode and number of proofs:

reset_gensym(+atom) - one

gensym/2

Returns a new unique atom with a given base (prefix).

Compilation flags:

static, synchronized

Template:

gensym(Base,Unique)

Mode and number of proofs:

gensym(+atom,-atom) - one

Protected predicates

(none)

Private predicates

base_/2

Table of generator bases and respective counters.

Compilation flags:

dynamic

Template:

base_(Base,Counter)

Mode and number of proofs:

base_(?atom,?integer) - zero_or_more

Operators

(none)

1.28 git

object

1.28.1 git

Predicates for accessing a git project current branch and latest commit data.

Availability:

logtalk_load([git\(loader\)](#))

Author: Paulo Moura

Version: 2:1:2

Date: 2024-03-11

Compilation flags:

static, context_switching_calls

Implements:

public [git_protocol](#)

Uses:

[os](#)

[user](#)

Remarks:

(none)

Inherited public predicates:

[branch/2](#) [commit_author/2](#) [commit_date/2](#) [commit_hash/2](#) [commit_hash_abbreviated/2](#)
[commit_log/3](#) [commit_message/2](#)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.28.2 git_protocol

Predicates for accessing a git project current branch and latest commit data.

Availability:

logtalk_load(git(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2022-01-21

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - branch/2
 - commit_author/2
 - commit_date/2
 - commit_hash/2
 - commit_hash_abbreviated/2
 - commit_message/2
 - commit_log/3
- Protected predicates
- Private predicates
- Operators

Public predicates

branch/2

Returns the name of the current git branch. Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

static

Template:

branch(Directory,Branch)

Mode and number of proofs:

branch(+atom,?atom) - zero_or_one

commit_author/2

Returns the latest commit author. Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

static

Template:

commit_author(Directory,Author)

Mode and number of proofs:

commit_author(+atom,-atom) - zero_or_one

commit_date/2

Returns the latest commit date (strict ISO 8601 format). Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

static

Template:

commit_date(Directory,Date)

Mode and number of proofs:

commit_date(+atom,-atom) - zero_or_one

commit_hash/2

Returns the latest commit hash. Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

static

Template:

commit_hash(Directory,Hash)

Mode and number of proofs:

`commit_hash(+atom,-atom) - zero_or_one`

`commit_hash_abbreviated/2`

Returns the latest commit abbreviated hash. Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

`static`

Template:

`commit_hash_abbreviated(Directory,Hash)`

Mode and number of proofs:

`commit_hash_abbreviated(+atom,-atom) - zero_or_one`

`commit_message/2`

Returns the latest commit message. Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

`static`

Template:

`commit_message(Directory,Message)`

Mode and number of proofs:

`commit_message(+atom,-atom) - zero_or_one`

commit_log/3

Returns the git latest commit log output for the given format (see e.g. <https://git-scm.com/docs/pretty-formats>). Fails if the directory is not a git repo or a sub-directory of a git repo directory.

Compilation flags:

static

Template:

commit_log(Directory,Format,Output)

Mode and number of proofs:

commit_log(+atom,+atom,-atom) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.29 grammars

object

1.29.1 blank_grammars(Format)

Blank grammars.

Availability:

logtalk_load(grammars(loader))

Author: Paulo Moura

Version: 0:3:1

Date: 2022-10-08

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - white_space//0
 - white_spaces//0
 - space//0
 - spaces//0
 - tab//0
 - tabs//0
 - new_line//0
 - new_lines//0
 - blank//0
 - blanks//0
 - non_blank//1
 - non_blanks//1
 - control//0
 - controls//0
- Protected predicates
- Private predicates
- Operators

Public predicates

white_space//0

Consumes a single space or tab.

Compilation flags:

static

Mode and number of proofs:

white_space - zero_or_one

white_spaces//0

Consumes zero or more spaces and tabs.

Compilation flags:

static

Mode and number of proofs:

white_spaces - one

space//0

Consumes a single space.

Compilation flags:

static

Mode and number of proofs:

space - zero_or_one

spaces//0

Consumes zero or more spaces.

Compilation flags:

static

Mode and number of proofs:

spaces - one

tab//0

Consumes a single tab.

Compilation flags:

static

Mode and number of proofs:

tab - zero_or_one

tabs//0

Consumes zero or more tabs.

Compilation flags:

static

Mode and number of proofs:

tabs - one

`new_line//0`

Consumes a single new line.

Compilation flags:

`static`

Mode and number of proofs:

`new_line - zero_or_one`

`new_lines//0`

Consumes zero or more new lines.

Compilation flags:

`static`

Mode and number of proofs:

`new_lines - one`

`blank//0`

Consumes a single space, tab, vertical tab, line feed, or new line.

Compilation flags:

`static`

Mode and number of proofs:

`blank - zero_or_one`

`blanks//0`

Consumes zero or more spaces, tabs, vertical tabs, line feeds, or new lines.

Compilation flags:

`static`

Mode and number of proofs:

`blanks - one`

`non_blank//1`

Returns a single non-blank character or character code.

Compilation flags:

`static`

Template:

`non_blank(NonBlank)`

Mode and number of proofs:

`non_blank(-atomic) - zero_or_one`

`non_blanks//1`

Returns a (possibly empty) list of non-blank characters or character codes.

Compilation flags:

`static`

Template:

`non_blanks(NonBlanks)`

Mode and number of proofs:

`non_blanks(-list(atomic)) - one`

control//0

Consumes a single control character or character code. Support for the null control character depends on the Prolog backend.

Compilation flags:

static

Mode and number of proofs:

control - zero_or_one

controls//0

Consumes zero or more control characters or character codes. Support for the null control character depends on the Prolog backend.

Compilation flags:

static

Mode and number of proofs:

controls - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.29.2 ip_grammars(Format)

IP address grammars.

Availability:

logtalk_load(grammars(loader))

Author: Paulo Moura

Version: 0:1:1

Date: 2022-10-08

Compilation flags:

static, context_switching_calls

Uses:

number_grammars(Format)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - ipv4//1
 - ipv6//1
- Protected predicates
- Private predicates
- Operators

Public predicates

ipv4//1

Parses an IPv4 network address in the format XXX.XXX.XXX.XXX where each XXX is an octet (i.e., an integer between 0 and 255).

Compilation flags:

static

Template:

ipv4(Octets)

Mode and number of proofs:

ipv4(?list(integer)) - zero_or_one

ipv6//1

Parses an IPv6 network address in the format XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX.XXXX where each X is a hexadecimal digit.

Compilation flags:

static

Template:

ipv6(HexDigits)

Mode and number of proofs:

ipv6(?list(integer)) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.29.3 number_grammars(Format)

Number grammars.

Availability:

logtalk_load(grammars(loader))

Author: Paulo Moura

Version: 0:2:2

Date: 2024-03-14

Compilation flags:

static, context_switching_calls

Uses:

list

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - bit//1
 - bits//1
 - digit//1
 - digits//1
 - hex_digit//1
 - hex_digits//1
 - natural//1
 - integer//1
 - float//1
 - number//1
 - sign//1
 - dot//1
- Protected predicates
- Private predicates
- Operators

Public predicates

bit//1

Parses a single bit.

Compilation flags:
static

Template:
bit(Bit)

Mode and number of proofs:
bit(?integer) - zero_or_one

bits//1

Parses a sequence of one or more bits.

Compilation flags:
static

Template:
bits(Bits)

Mode and number of proofs:
bits(?list(integer)) - zero_or_one

digit//1

Parses a single decimal digit.

Compilation flags:
static

Template:
digit(Digit)

Mode and number of proofs:
digit(?atomic) - zero_or_one

`digits//1`

Parses a sequence of zero or more digits.

Compilation flags:
 `static`

Template:
 `digits(Digits)`

Mode and number of proofs:
 `digits(?list(atomic)) - one`

`hex_digit//1`

Parses a single hexa-decimal digit.

Compilation flags:
 `static`

Template:
 `hex_digit(HexDigit)`

Mode and number of proofs:
 `hex_digit(?atomic) - zero_or_one`

`hex_digits//1`

Parses a sequence of zero or more hexa-decimal digits.

Compilation flags:
 `static`

Template:
 `hex_digits(HexDigits)`

Mode and number of proofs:

`hex_digits(?list(atomic)) - one`

`natural//1`

Parses a natural number (a non signed integer).

Compilation flags:

`static`

Template:

`natural(Natural)`

Mode and number of proofs:

`natural(?non_negative_integer) - zero_or_one`

`integer//1`

Parses an integer.

Compilation flags:

`static`

Template:

`integer(Integer)`

Mode and number of proofs:

`integer(?integer) - zero_or_one`

`float//1`

Parses a float.

Compilation flags:

`static`

Template:

float(Float)

Mode and number of proofs:

float(?float) - zero_or_one

number//1

Parses a number (an integer or a float).

Compilation flags:

static

Template:

number(Number)

Mode and number of proofs:

number(?number) - zero_or_one

sign//1

Parses a number sign (plus or minus).

Compilation flags:

static

Template:

sign(Sign)

Mode and number of proofs:

sign(?atomic) - zero_or_one

dot//1

Parses a decimal dot.

Compilation flags:

static

Template:

dot(Dot)

Mode and number of proofs:

dot(?atomic) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.29.4 sequence_grammars

Sequence grammars.

Availability:

logtalk_load(grammars(loader))

Author: Paulo Moura

Version: 0:3:0

Date: 2023-12-09

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - zero_or_more//2
 - one_or_more//2
 - zero_or_more//1
 - one_or_more//1
 - zero_or_more//0
 - one_or_more//0
 - without//2
- Protected predicates
- Private predicates
- Operators

Public predicates

zero_or_more//2

Eagerly collect zero or more terminals that satisfy the given closure.

Compilation flags:

static

Template:

zero_or_more(Closure,Terminals)

Meta-predicate template:

zero_or_more(1,*)

Mode and number of proofs:

zero_or_more(+callable,-list(atomic)) - one

`one_or_more//2`

Eagerly collect one or more terminals that satisfy the given closure.

Compilation flags:

`static`

Template:

`one_or_more(Closure,Terminals)`

Meta-predicate template:

`one_or_more(1,*)`

Mode and number of proofs:

`one_or_more(+callable,-list(atomic)) - zero_or_one`

`zero_or_more//1`

Eagerly collect zero or more terminals.

Compilation flags:

`static`

Template:

`zero_or_more(Terminals)`

Mode and number of proofs:

`zero_or_more(-list(atomic)) - one`

`one_or_more//1`

Eagerly collect one or more terminals.

Compilation flags:

`static`

Template:

`one_or_more(Terminals)`

Mode and number of proofs:

`one_or_more(-list(atomic)) - zero_or_one`

`zero_or_more//0`

Eagerly parse zero or more terminals.

Compilation flags:

`static`

Mode and number of proofs:

`zero_or_more - one`

`one_or_more//0`

Eagerly parse one or more terminals.

Compilation flags:

`static`

Mode and number of proofs:

`one_or_more - zero_or_one`

`without//2`

Collects input terminals until one of the stop terminals is found. The stop terminals are excluded from the collected terminals.

Compilation flags:

`static`

Template:

`without(StopTerminals,Terminals)`

Mode and number of proofs:

`without(+list(atomic),-list(atomic)) - one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.30 heaps

object

1.30.1 heap(Order)

Heap implementation, parameterized by the order to be used to compare keys (< or >).

Availability:

```
logtalk_load(heaps(loader))
```

Author: Richard O'Keefe; adapted to Logtalk by Paulo Moura and Victor Lagerkvist.

Version: 1:1:0

Date: 2019-05-18

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public heapp
```

Extends:

```
public compound
```

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 as_heap/2 as_list/2 check/1 delete/4
depth/2 empty/1 ground/1 insert/4 insert_all/3 merge/3 new/1 numbervars/1 numbervars/3
occurs/2 singletons/2 size/2 subsumes/2 subterm/2 top/3 top_next/5 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

minheap, maxheap

protocol

1.30.2 heapp

Heap protocol. Key-value pairs are represented as Key-Value.

Availability:

logtalk_load(heaps(loader))

Author: Richard O'Keefe; adapted to Logtalk by Paulo Moura and Victor Lagerkvist.

Version: 1:0:1

Date: 2010-11-13

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - insert/4
 - insert_all/3
 - delete/4
 - merge/3
 - empty/1
 - size/2
 - as_list/2
 - as_heap/2
 - top/3
 - top_next/5
- Protected predicates
- Private predicates
- Operators

Public predicates

insert/4

Inserts the new pair into a heap, returning the updated heap.

Compilation flags:

static

Template:

insert(Key,Value,Heap,NewHeap)

Mode and number of proofs:

`insert(+key,+value,+heap,-heap) - one`

`insert_all/3`

Inserts a list of pairs into a heap, returning the updated heap.

Compilation flags:

`static`

Template:

`insert_all(List,Heap,NewHeap)`

Mode and number of proofs:

`insert_all(@list(pairs),+heap,-heap) - one`

`delete/4`

Deletes and returns the top pair in a heap returning the updated heap.

Compilation flags:

`static`

Template:

`delete(Heap,TopKey,TopValue,NewHeap)`

Mode and number of proofs:

`delete(+heap,?key,?value,-heap) - zero_or_one`

`merge/3`

Merges two heaps.

Compilation flags:

`static`

Template:

`merge(Heap1,Heap2,NewHeap)`

Mode and number of proofs:

`merge(+heap,+heap,-heap) - one`

`empty/1`

True if the heap is empty.

Compilation flags:

`static`

Template:

`empty(Heap)`

Mode and number of proofs:

`empty(@heap) - zero_or_one`

`size/2`

Returns the number of heap elements.

Compilation flags:

`static`

Template:

`size(Heap,Size)`

Mode and number of proofs:

`size(+heap,?integer) - zero_or_one`

as_list/2

Returns the current set of pairs in the heap as a list, sorted into ascending order of the keys.

Compilation flags:

static

Template:

as_list(Heap,List)

Mode and number of proofs:

as_list(+heap,-list) - one

as_heap/2

Constructs a heap from a list of pairs.

Compilation flags:

static

Template:

as_heap(List,Heap)

Mode and number of proofs:

as_heap(+list,-heap) - one

top/3

Returns the top pair in the heap. Fails if the heap is empty.

Compilation flags:

static

Template:

top(Heap,TopKey,TopValue)

Mode and number of proofs:

top(+heap,?key,?value) - zero_or_one

`top_next/5`

Returns the top pair and the next pair in the heap. Fails if the heap does not have at least two elements.

Compilation flags:

`static`

Template:

`top_next(Heap,TopKey,TopValue,NextKey,NextValue)`

Mode and number of proofs:

`top_next(+heap,?key,?value,?key,?value) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`heap(Order)`

object

1.30.3 maxheap

Max-heap implementation. Uses standard order to compare keys.

Availability:

`logtalk_load(heaps(loader))`

Author: Paulo Moura.

Version: 1:0:0

Date: 2010-02-19

Compilation flags:

static, context_switching_calls

Extends:

public heap(>)

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 as_heap/2 as_list/2 check/1 delete/4
depth/2 empty/1 ground/1 insert/4 insert_all/3 merge/3 new/1 numbervars/1 numbervars/3
occurs/2 singletons/2 size/2 subsumes/2 subterm/2 top/3 top_next/5 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.30.4 minheap

Min-heap implementation. Uses standard order to compare keys.

Availability:

```
logtalk_load(heaps(loader))
```

Author: Paulo Moura.

Version: 1:0:0

Date: 2010-02-19

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public heap(<)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 as_heap/2 as_list/2 check/1 delete/4  
depth/2 empty/1 ground/1 insert/4 insert_all/3 merge/3 new/1 numbervars/1 numbervars/3  
occurs/2 singletons/2 size/2 subsumes/2 subterm/2 top/3 top_next/5 valid/1 variables/2  
variant/2 varnumbers/2 varnumbers/3
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.31 help

object

1.31.1 help

Command-line help for Logtalk libraries, entities, plus built-in control constructs, predicates, non-terminals, and methods.

Availability:

`logtalk_load(help(loader))`

Author: Paulo Moura

Version: 0:35:0

Date: 2024-12-16

Compilation flags:

`static, context_switching_calls, complements(allow)`

Implements:

`public forwarding`

Uses:

`atom`

`os`

`user`

Remarks:

(none)

Inherited public predicates:

apis/0 apis/1 forward/1 handbook/0 handbook/1 man/1

- Public predicates
 - help/0
 - (/)/2
 - (//)/2
 - completion/2
 - completions/2
 - built_in_directive/4
 - built_in_predicate/4
 - built_in_method/4
 - control_construct/4
 - built_in_non_terminal/4
 - library/0
 - library/1
 - entity/1
 - manuals/0
- Protected predicates
- Private predicates
- Operators

Public predicates

help/0

Prints instructions on how to use the help tool.

Compilation flags:

static

Mode and number of proofs:

help - one

`(/)/2`

Provides help on the Functor/Arity built-in control construct, directive, predicate, or method.

Compilation flags:

`static`

Template:

`Functor/Arity`

Mode and number of proofs:

`+atom/ +integer - zero_or_one`

`(//)/2`

Provides help on the Functor//Arity built-in non-terminal.

Compilation flags:

`static`

Template:

`Functor//Arity`

Mode and number of proofs:

`+atom// +integer - zero_or_one`

`completion/2`

Provides a completion pair, Completion-Page, for a given prefix.

Compilation flags:

`static`

Template:

`completion(Prefix,Completion)`

Mode and number of proofs:

`completion(+atom,-pair) - zero_or_more`

completions/2

Provides a list of completions pairs, Completion-Page, for a given prefix.

Compilation flags:

static

Template:

completions(Prefix,Completions)

Mode and number of proofs:

completions(+atom,-lists(pair)) - zero_or_more

built_in_directive/4

Provides access to the HTML documenting files describing built-in directives.

Compilation flags:

static

Template:

built_in_directive(Functor,Arity,Directory,Basename)

Mode and number of proofs:

built_in_directive(?atom,?integer,-atom,-atom) - zero_or_more

built_in_predicate/4

Provides access to the HTML documenting files describing built-in predicates.

Compilation flags:

static

Template:

built_in_predicate(Functor,Arity,Directory,Basename)

Mode and number of proofs:

built_in_predicate(?atom,?integer,-atom,-atom) - zero_or_more

built_in_method/4

Provides access to the HTML documenting files describing built-in methods.

Compilation flags:

static

Template:

built_in_method(Functor,Arity,Directory,Basename)

Mode and number of proofs:

built_in_method(?atom,?integer,-atom,-atom) - zero_or_more

control_construct/4

Provides access to the HTML documenting files describing built-in control constructs.

Compilation flags:

static

Template:

control_construct(Functor,Arity,Directory,Basename)

Mode and number of proofs:

control_construct(?atom,?integer,-atom,-atom) - zero_or_more

built_in_non_terminal/4

Provides access to the HTML documenting files describing built-in DCG non-terminals.

Compilation flags:

static

Template:

built_in_non_terminal(Functor,Arity,Directory,Basename)

Mode and number of proofs:

built_in_non_terminal(?atom,?integer,-atom,-atom) - zero_or_more

library/0

Provides help on the standard Logtalk library.

Compilation flags:

static

Mode and number of proofs:

library - one

library/1

Provides help on the standard Logtalk libraries, library predicates, and library non-terminals.

Compilation flags:

static

Template:

library(`Topic`)

Mode and number of proofs:

library(+atom) - zero_or_one

library(+predicate_indicator) - zero_or_one

library(+non_terminal_indicator) - zero_or_one

entity/1

Provides help on Logtalk entities (objects, protocols, or categories).

Compilation flags:

static

Template:

entity(`Entity`)

Mode and number of proofs:

entity(+entity_identifier) - zero_or_one

manuals/0

Provides access to the Logtalk User and Reference manuals.

Compilation flags:

static

Mode and number of proofs:

manuals - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.31.2 help_info_support

Experimental help predicates for inline browsing of the Texinfo versions of the Handbook and APIs documentation. Currently requires Ciao Prolog, ECLiPSe, GNU Prolog, XVM, SICStus Prolog, SWI-Prolog, Trealla Prolog, XSB, or YAP as the backend running on a POSIX system.

Availability:

logtalk_load(help(loader))

Author: Paulo Moura

Version: 0:8:1

Date: 2024-04-08

Compilation flags:

static

Complements:

help

Uses:

os

user

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - handbook/0
 - handbook/1
 - apis/0
 - apis/1
 - man/1
- Protected predicates
- Private predicates
- Operators

Public predicates

handbook/0

Opens inline the Texinfo version of the Handbook.

Compilation flags:

static

Mode and number of proofs:

handbook - one

handbook/1

Opens inline the Texinfo version of the Handbook at the given topic.

Compilation flags:

static

Template:

handbook(Topic)

Mode and number of proofs:

handbook(+atom) - one

handbook(+predicate_indicator) - one

handbook(+non_terminal_indicator) - one

apis/0

Opens inline the Texinfo version of the APIs documentation.

Compilation flags:

static

Mode and number of proofs:

apis - one

apis/1

Opens inline the Texinfo version of the APIs documentation at the given topic.

Compilation flags:

static

Template:

apis(Topic)

Mode and number of proofs:

apis(+atom) - one

apis(+predicate_indicator) - one

apis(+non_terminal_indicator) - one

man/1

Opens inline the man page of the given script.

Compilation flags:

static

Template:

man(Script)

Mode and number of proofs:

man(+atom) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.32 hierarchies

category

1.32.1 class_hierarchy

Class hierarchy predicates.

Availability:

logtalk_load(hierarchies(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2006-02-20

Compilation flags:

static

Implements:

public class_hierarchy

Remarks:

(none)

Inherited public predicates:

ancestor/1 ancestors/1 class/1 classes/1 descendant/1 descendant_class/1 descendant_classes/1
descendant_instance/1 descendant_instances/1 descendants/1 instance/1 instances/1 leaf/1
leaf_class/1 leaf_classes/1 leaf_instance/1 leaf_instances/1 leaves/1 subclass/1 subclasses/1
superclass/1 superclasses/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.32.2 class_hierarchy

Class hierarchy protocol.

Availability:

```
logtalk_load(hierarchies(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2000-07-24

Compilation flags:

```
static
```

Extends:

```
public hierarchy
```

Remarks:

(none)

Inherited public predicates:

```
ancestor/1 ancestors/1 descendant/1 descendants/1 leaf/1 leaves/1
```

- Public predicates
 - class/1
 - classes/1
 - instance/1
 - instances/1
 - subclass/1
 - subclasses/1
 - superclass/1
 - superclasses/1
 - leaf_instance/1

- leaf_instances/1
- leaf_class/1
- leaf_classes/1
- descendant_instance/1
- descendant_instances/1
- descendant_class/1
- descendant_classes/1
- Protected predicates
- Private predicates
- Operators

Public predicates

class/1

Returns, by backtracking, all object classes.

Compilation flags:

static

Template:

class(Class)

Mode and number of proofs:

class(?object) - zero_or_more

classes/1

List of all object classes.

Compilation flags:

static

Template:

classes(Classes)

Mode and number of proofs:

classes(-list) - one

instance/1

Returns, by backtracking, all class instances.

Compilation flags:

static

Template:

instance(Instance)

Mode and number of proofs:

instance(?object) - zero_or_more

instances/1

List of all class instances.

Compilation flags:

static

Template:

instances(Instances)

Mode and number of proofs:

instances(-list) - one

subclass/1

Returns, by backtracking, all class subclasses.

Compilation flags:

static

Template:

subclass(Subclass)

Mode and number of proofs:

`subclass(?object) - zero_or_more`

`subclasses/1`

List of all class subclasses.

Compilation flags:

`static`

Template:

`subclasses(Subclasses)`

Mode and number of proofs:

`subclasses(-list) - one`

`superclass/1`

Returns, by backtracking, all class superclasses.

Compilation flags:

`static`

Template:

`superclass(Superclass)`

Mode and number of proofs:

`superclass(?object) - zero_or_more`

`superclasses/1`

List of all class superclasses.

Compilation flags:

`static`

Template:

superclasses(Superclasses)

Mode and number of proofs:

superclasses(-list) - one

leaf_instance/1

Returns, by backtracking, all class leaf instances.

Compilation flags:

static

Template:

leaf_instance(Leaf)

Mode and number of proofs:

leaf_instance(?object) - zero_or_more

leaf_instances/1

List of all class leaf instances.

Compilation flags:

static

Template:

leaf_instances(Leaves)

Mode and number of proofs:

leaf_instances(-list) - one

leaf_class/1

Returns, by backtracking, all class leaf subclasses.

Compilation flags:

static

Template:

leaf_class(Leaf)

Mode and number of proofs:

leaf_class(?object) - zero_or_more

leaf_classes/1

List of all class leaf leaf subclasses.

Compilation flags:

static

Template:

leaf_classes(Leaves)

Mode and number of proofs:

leaf_classes(-list) - one

descendant_instance/1

Returns, by backtracking, all class descendant instances.

Compilation flags:

static

Template:

descendant_instance(Descendant)

Mode and number of proofs:

descendant_instance(?object) - zero_or_more

descendant_instances/1

List of all class descendant instances.

Compilation flags:

static

Template:

descendant_instances(Descendants)

Mode and number of proofs:

descendant_instances(-list) - one

descendant_class/1

Returns, by backtracking, all class descendant subclasses.

Compilation flags:

static

Template:

descendant_class(Descendant)

Mode and number of proofs:

descendant_class(?object) - zero_or_more

descendant_classes/1

List of all class descendant subclasses.

Compilation flags:

static

Template:

descendant_classes(Descendants)

Mode and number of proofs:

descendant_classes(-list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`class_hierarchy`

`protocol`

1.32.3 hierarchy

Common hierarchy protocol for prototype and class hierarchies.

Availability:

```
logtalk_load(hierarchies(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2000-07-24

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- `Public predicates`
 - `ancestor/1`

- ancestors/1
- leaf/1
- leaves/1
- descendant/1
- descendants/1
- Protected predicates
- Private predicates
- Operators

Public predicates

ancestor/1

Returns, by backtracking, all object ancestors.

Compilation flags:

static

Template:

ancestor(Ancestor)

Mode and number of proofs:

ancestor(?object) - zero_or_more

ancestors/1

List of all object ancestors.

Compilation flags:

static

Template:

ancestors(Ancestors)

Mode and number of proofs:

ancestors(-list) - one

leaf/1

Returns, by backtracking, all object leaves.

Compilation flags:

static

Template:

leaf(Leaf)

Mode and number of proofs:

leaf(?object) - zero_or_more

leaves/1

List of all object leaves.

Compilation flags:

static

Template:

leaves(Leaves)

Mode and number of proofs:

leaves(-list) - one

descendant/1

Returns, by backtracking, all object descendants.

Compilation flags:

static

Template:

descendant(Descendant)

Mode and number of proofs:

descendant(?object) - zero_or_more

descendants/1

List of all object descendants.

Compilation flags:

static

Template:

descendants(Descendants)

Mode and number of proofs:

descendants(-list) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

category

1.32.4 proto_hierarchy

Prototype hierarchy predicates.

Availability:

logtalk_load(hierarchies(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2006-02-20

Compilation flags:

static

Implements:

public proto_hierarchyp

Remarks:

(none)

Inherited public predicates:

ancestor/1 ancestors/1 descendant/1 descendants/1 extension/1 extensions/1 leaf/1 leaves/1
parent/1 parents/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.32.5 proto_hierarchyp

Prototype hierarchy protocol.

Availability:

logtalk_load(hierarchies(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2006-02-20

Compilation flags:

static

Extends:

public [hierarchyp](#)

Remarks:

(none)

Inherited public predicates:

[ancestor/1](#) [ancestors/1](#) [descendant/1](#) [descendants/1](#) [leaf/1](#) [leaves/1](#)

- Public predicates
 - [parent/1](#)
 - [parents/1](#)
 - [extension/1](#)
 - [extensions/1](#)
- Protected predicates
- Private predicates
- Operators

Public predicates

[parent/1](#)

Returns, by backtracking, all object parents.

Compilation flags:

static

Template:

[parent](#)(Parent)

Mode and number of proofs:

[parent](#)(?object) - zero_or_more

parents/1

List of all object parents.

Compilation flags:

static

Template:

parents(Parents)

Mode and number of proofs:

parents(-list) - one

extension/1

Returns, by backtracking, all object direct descendants.

Compilation flags:

static

Template:

extension(Extension)

Mode and number of proofs:

extension(?object) - zero_or_more

extensions/1

List of all object direct descendants.

Compilation flags:

static

Template:

extensions(Extensions)

Mode and number of proofs:

extensions(-list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`proto_hierarchy`

1.33 hook_flows

object

1.33.1 hook_pipeline(Pipeline)

- Pipeline - List of hook objects.

Use a pipeline (represented using a list) of hook objects to expand terms and goals. The expansion results from a hook object are passed to the next hook object in the pipeline.

Availability:

```
logtalk_load(hook_flows(loader))
```

Author: Paulo Moura

Version: 2:0:0

Date: 2024-09-27

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

- Usage: Compile source files that should be expanded using the pipeline of hook objects using the compiler option `hook(hook_pipeline(Pipeline))`.

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

hook_set(Set)

object

1.33.2 hook_set(Set)

- Set - Set (list) of hook objects.

Use a set (represented using a list) of hook objects to expand terms and goals. The hook objects are tried in sequence until one of them succeeds in expanding the current term (goal) into a different term (goal).

Availability:

logtalk_load(hook_flows(loader))

Author: Paulo Moura

Version: 2:0:0

Date: 2024-09-27

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Remarks:

- Usage: Compile source files that should be expanded using the set of hook objects using the compiler option `hook(hook_set(Set))`.

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`hook_pipeline(Pipeline)`

1.34 hook_objects

object

1.34.1 backend_adapter_hook

This hook object applies the expansion rules defined in the Prolog backend adapter file.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-17

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`default_workflow_hook`, `identity_hook`, `grammar_rules_hook`, `prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`, `print_goal_hook`, `suppress_goal_hook`

object

1.34.2 `default_workflow_hook`

Use this object as the default hook object to restore the default expansion pipeline semantics used by the compiler.

Availability:

`logtalk_load(hook_objects(loader))`

Author: Paulo Moura

Version: 1:0:1

Date: 2020-03-24

Compilation flags:

`static`, `context_switching_calls`

Implements:

public `expanding`

Remarks:

(none)

Inherited public predicates:

`goal_expansion/2` `term_expansion/2`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `identity_hook`, `grammar_rules_hook`, `prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`, `print_goal_hook`, `suppress_goal_hook`

object

1.34.3 `grammar_rules_hook`

This hook object expands grammar rules into clauses.

Availability:

`logtalk_load(hook_objects(loader))`

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-14

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

backend_adapter_hook, default_workflow_hook, identity_hook, prolog_module_hook(Module),
 object_wrapper_hook, write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream),
 print_goal_hook, suppress_goal_hook

object

1.34.4 identity_hook

Use this object as a file specific hook object to prevent any (other) user-defined expansion rules to be applied when compiling the file.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-15

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `default_workflow_hook`, `grammar_rules_hook`, `prolog_module_hook(Module)`,
`object_wrapper_hook`, `write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`,
`print_goal_hook`, `suppress_goal_hook`

object

1.34.5 `object_wrapper_hook`

Use this object to wrap the contents of a plain Prolog file in an object named after the file. The wrapper sets the `context_switching_calls` flag to allow, enabling calling of the wrapped predicates using the `<</2` control construct.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:1:0

Date: 2020-10-30

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Uses:

```
os
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`object_wrapper_hook(Protocol)`, `object_wrapper_hook(Name,Relations)`, `back-end_adapter_hook`, `default_workflow_hook`, `grammar_rules_hook`, `prolog_module_hook(Module)`, `write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`, `print_goal_hook`, `suppress_goal_hook`

`object`

1.34.6 `object_wrapper_hook(Protocol)`

Use this object to wrap the contents of a plain Prolog file in an object named after the file that implements the given protocol.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2021-11-24

Compilation flags:

```
static, context_switching_calls
```

Implements:

public expanding

Uses:

os

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

object_wrapper_hook, object_wrapper_hook(Name,Relations), backend_adapter_hook,
 default_workflow_hook, grammar_rules_hook, prolog_module_hook(Module),
 write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream), print_goal_hook, sup-
 press_goal_hook

object

1.34.7 object_wrapper_hook(Name,Relations)

Use this object to wrap the contents of a plain Prolog file in an object with the given name and object entity relations (a list).

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-02-03

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

```

object_wrapper_hook,          object_wrapper_hook(Protocol),          backend_adapter_hook,
default_workflow_hook,      grammar_rules_hook,          prolog_module_hook(Module),
write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream), print_goal_hook, suppress_goal_hook

```

object

1.34.8 print_goal_hook

Use this object to easily print entity predicate goals before, after, or before and after calling them.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-03-14

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

- Usage: Mark a goal to be printed by prefixing it with an operator. Printing uses a comment message.
- To print goal before calling it: - Goal.
- To print goal after calling it: + Goal.
- To print goal before and after calling it: * Goal.

- Operators: This hook object uses the standard - and + prefix operators and also defines a global * prefix operator with the same type and priority.

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

backend_adapter_hook, default_workflow_hook, grammar_rules_hook, identity_hook, prolog_module_hook(Module), object_wrapper_hook, write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream), suppress_goal_hook

object

1.34.9 prolog_module_hook(Module)

This hook object applies the expansion rules defined in a Prolog module (e.g., user).

Availability:

logtalk_load(hook_objects(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-17

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

backend_adapter_hook, default_workflow_hook, identity_hook, grammar_rules_hook, object_wrapper_hook, write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream), print_goal_hook, suppress_goal_hook

object

1.34.10 suppress_goal_hook

Use this object to easily suppress a goal in a clause body.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-05-04

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

- Usage: Mark a goal to be suppressed by prefixing it with the -- operator.
- Operators: This hook object uses the -- prefix operator declared by Logtalk for use in mode/2 directives.

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `default_workflow_hook`, `grammar_rules_hook`, `identity_hook`, `prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`, `print_goal_hook`

object

1.34.11 `write_to_file_hook(File)`

This hook object writes term-expansion results to a file in canonical format. The terms are terminated by a period and a new line.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-07-06

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public write_to_file_hook(File,[quoted(true),ignore_ops(true)])
```

Remarks:

(none)

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `default_workflow_hook`, `identity_hook`, `grammar_rules_hook`,
`prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_file_hook(File,Options)`,
`write_to_stream_hook(Stream,Options)`, `write_to_stream_hook(Stream)`, `print_goal_hook`, `suppress_goal_hook`

object

1.34.12 `write_to_file_hook(File,Options)`

This hook object writes term-expansion results to a file using a list of `write_term/3` options. The terms are terminated by a period and a new line.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-07-06

Compilation flags:

```
static, context_switching_calls
```

Implements:

public expanding

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

backend_adapter_hook, default_workflow_hook, identity_hook, grammar_rules_hook,
 prolog_module_hook(Module), object_wrapper_hook, write_to_file_hook(File),
 write_to_stream_hook(Stream,Options), write_to_stream_hook(Stream), print_goal_hook, sup-
 press_goal_hook

object

1.34.13 write_to_stream_hook(Stream)

This hook object writes term-expansion results to a stream in canonical format. The terms are terminated by a period and a new line.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-16

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public write_to_stream_hook(Stream,[quoted(true),ignore_ops(true)])
```

Remarks:

(none)

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `default_workflow_hook`, `identity_hook`, `grammar_rules_hook`, `prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_stream_hook(Stream,Options)`, `write_to_file_hook(File,Options)`, `write_to_file_hook(File)`, `print_goal_hook`, `suppress_goal_hook`
object

1.34.14 `write_to_stream_hook(Stream,Options)`

This hook object writes term-expansion results to a stream using a list of `write_term/3` options. The terms are terminated by a period and a new line.

Availability:

```
logtalk_load(hook_objects(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2020-02-16

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Remarks:

(none)

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`backend_adapter_hook`, `default_workflow_hook`, `identity_hook`, `grammar_rules_hook`,
`prolog_module_hook(Module)`, `object_wrapper_hook`, `write_to_stream_hook(Stream)`,
`write_to_file_hook(File,Options)`, `write_to_file_hook(File)`, `print_goal_hook`, `suppress_goal_hook`

1.35 html

category

1.35.1 html

HTML generation.

Availability:

`logtalk_load(html(loader))`

Author: Paul Brown and Paulo Moura

Version: 0:3:0

Date: 2021-03-30

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - generate/2
 - void_element/1
 - normal_element/2
- Protected predicates
- Private predicates
 - doctype/1
- Operators

Public predicates

generate/2

Generates HTML content using the representation specified in the first argument (stream(Stream) or file(Path)) for the term in the second argument.

Compilation flags:

static

Template:

generate(Sink,Term)

Mode and number of proofs:

generate(+compound,++term) - one_or_error

`void_element/1`

Enumerates, by backtracking, all void elements.

Compilation flags:

`static`

Template:

`void_element(Element)`

Mode and number of proofs:

`void_element(?atom) - zero_or_more`

`normal_element/2`

Enumerates, by backtracking, all normal elements. The value of the `Display` argument is either `inline` or `block`.

Compilation flags:

`static`

Template:

`normal_element(Element,Display)`

Mode and number of proofs:

`normal_element(?atom,?atom) - zero_or_more`

Protected predicates

(none)

Private predicates

`doctype/1`

Doctype text.

Compilation flags:

`static`

Template:

```
doctype(DocType)
```

Mode and number of proofs:

```
doctype(?atom) - one
```

Operators

(none)

object

1.35.2 html5

HTML content generation using the HTML 5 doctype.

Availability:

```
logtalk_load(html(loader))
```

Author: Paul Brown and Paulo Moura

Version: 1:0:0

Date: 2021-03-29

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public html
```

Remarks:

```
(none)
```

Inherited public predicates:

```
generate/2 normal_element/2 void_element/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.35.3 xhtml11

XHTML content generation using the XHTML 1.1 doctype.

Availability:

`logtalk_load(html(loader))`

Author: Paul Brown and Paulo Moura

Version: 1:0:0

Date: 2021-03-29

Compilation flags:

`static, context_switching_calls`

Imports:

`public html`

Remarks:

(none)

Inherited public predicates:

`generate/2 normal_element/2 void_element/1`

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.36 ids

object

1.36.1 ids

Generator of random identifiers with 160 bits (20 bytes) of randomness.

Availability:

```
logtalk_load(ids(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-11-23

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public ids(atom,20)
```

Remarks:

(none)

Inherited public predicates:

generate/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

ids(Representation,Bytes), uuid, ulid

object

1.36.2 ids(Representation,Bytes)

- Representation - Text representation for the identifier. Possible values are atom, chars, and codes.
- Bytes - Number of bytes of randomness.

Generator of random identifiers.

Availability:

logtalk_load(ids(loader))

Author: Paulo Moura

Version: 1:0:0
Date: 2022-11-23

Compilation flags:
static, context_switching_calls

Uses:
base64
fast_random
list
os

Remarks:
(none)

Inherited public predicates:
(none)

- Public predicates
 - generate/1
- Protected predicates
- Private predicates
- Operators

Public predicates

generate/1

Generate a random identifier.

Compilation flags:
static

Template:
generate(Identifier)
Mode and number of proofs:
generate(--textids) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

ids, uuid, ulid

1.37 intervals

object

1.37.1 interval

Basic temporal interval relations. An interval is represented by a compound term, `i/2`, with two ground arguments, the start and end points.

Availability:

```
logtalk_load(intervals(loader))
```

Author: Paulo Moura

Version: 1:2:1

Date: 2022-01-15

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public intervalp
```

Aliases:

```
intervalp before/2 as b/2
```

```
intervalp after/2 as bi/2
```

```
intervalp meets/2 as m/2
```

```
intervalp met_by/2 as mi/2
```

```
intervalp overlaps/2 as o/2
```

```
intervalp overlapped_by/2 as oi/2
```

```
intervalp starts/2 as s/2
```

intervalp started_by/2 as si/2
 intervalp during/2 as d/2
 intervalp contains/2 as di/2
 intervalp finishes/2 as f/2
 intervalp finished_by/2 as fi/2
 intervalp equal/2 as eq/2

Remarks:

(none)

Inherited public predicates:

after/2 before/2 contains/2 during/2 equal/2 finished_by/2 finishes/2 meets/2 met_by/2
 new/3 overlapped_by/2 overlaps/2 started_by/2 starts/2 valid/1

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.37.2 intervalp

Basic temporal interval relations protocol (based on James F. Allen Interval Algebra work).

Availability:

```
logtalk_load(intervals(loader))
```

Author: Paulo Moura

Version: 1:1:0

Date: 2014-04-26

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - new/3
 - valid/1
 - before/2
 - after/2
 - meets/2
 - met_by/2
 - overlaps/2
 - overlapped_by/2
 - starts/2
 - started_by/2
 - during/2
 - contains/2
 - finishes/2

- finished_by/2
- equal/2
- Protected predicates
- Private predicates
- Operators

Public predicates

new/3

Constructs a new interval given start and end points. The start point must strictly precede the end point.

Compilation flags:

static

Template:

new(Start,End,Interval)

Mode and number of proofs:

new(@ground,@ground,-interval) - zero_or_one

valid/1

True if Interval is a valid interval.

Compilation flags:

static

Template:

valid(Interval)

Mode and number of proofs:

valid(@interval) - zero_or_one

before/2

True if Interval1 takes place before Interval2.

Compilation flags:

static

Template:

before(Interval1,Interval2)

Mode and number of proofs:

before(@interval,@interval) - zero_or_one

after/2

True if Interval1 takes place after Interval2.

Compilation flags:

static

Template:

after(Interval1,Interval2)

Mode and number of proofs:

after(@interval,@interval) - zero_or_one

meets/2

True if Interval1 meets Interval2.

Compilation flags:

static

Template:

meets(Interval1,Interval2)

Mode and number of proofs:

meets(@interval,@interval) - zero_or_one

met_by/2

True if Interval1 is met by Interval2.

Compilation flags:

static

Template:

met_by(Interval1,Interval2)

Mode and number of proofs:

met_by(@interval,@interval) - zero_or_one

overlaps/2

True if Interval1 overlaps with Interval2.

Compilation flags:

static

Template:

overlaps(Interval1,Interval2)

Mode and number of proofs:

overlaps(@interval,@interval) - zero_or_one

overlapped_by/2

True if Interval1 is overlapped by Interval2.

Compilation flags:

static

Template:

overlapped_by(Interval1,Interval2)

Mode and number of proofs:

overlapped_by(@interval,@interval) - zero_or_one

starts/2

True if Interval1 starts Interval2.

Compilation flags:

static

Template:

starts(Interval1,Interval2)

Mode and number of proofs:

starts(@interval,@interval) - zero_or_one

started_by/2

True if Interval1 is started by Interval2.

Compilation flags:

static

Template:

started_by(Interval1,Interval2)

Mode and number of proofs:

started_by(@interval,@interval) - zero_or_one

during/2

True if Interval1 occurs during Interval2.

Compilation flags:

static

Template:

during(Interval1,Interval2)

Mode and number of proofs:

during(@interval,@interval) - zero_or_one

contains/2

True if Interval1 contains Interval2.

Compilation flags:

static

Template:

contains(Interval1,Interval2)

Mode and number of proofs:

contains(@interval,@interval) - zero_or_one

finishes/2

True if Interval1 finishes Interval2.

Compilation flags:

static

Template:

finishes(Interval1,Interval2)

Mode and number of proofs:

finishes(@interval,@interval) - zero_or_one

finished_by/2

True if Interval1 is finished by Interval2.

Compilation flags:

static

Template:

finished_by(Interval1,Interval2)

Mode and number of proofs:

finished_by(@interval,@interval) - zero_or_one

equal/2

True if Interval1 is equal to Interval2.

Compilation flags:

static

Template:

equal(Interval1,Interval2)

Mode and number of proofs:

equal(@interval,@interval) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

interval

1.38 iso8601

object

1.38.1 iso8601

ISO 8601 (and European civil calendar) compliant library of date predicates.

Availability:

logtalk_load(iso8601(loader))

Author: Daniel L. Dudley

Version: 1:0:3

Date: 2019-10-09

Compilation flags:

static, context_switching_calls

Uses:

os

Remarks:

- Scope: This object currently provides a powerful, versatile and efficient set of date-handling predicates, which—thanks to Logtalk—may be used as is on a wide range of Prolog compilers. Besides taking time to familiarize oneself with each predicate, the user should take note of the following information.
- Validation of dates: Date parts are not validated—that is the caller’s responsibility! However, not being quite heartless yet, we do provide a predicate for this purpose.
- Date arithmetic: Many of the examples illustrate a simplified method of doing date arithmetic. Note, however, that we do not generally recommend this practice—it is all too easy to make mistakes. The safest way of finding the day difference between two dates is to first convert the dates to their Julian day numbers and then subtract one from the other. Similarly, the safe way to add or subtract a day offset to a particular date is to first convert the date to its Julian day number, add or subtract the day offset, and then convert the result to its corresponding date.
- BC years: ISO 8601 specifies that the Gregorian calendar be used, yet requires that years prior to 1 AD be handled arithmetically, i.e., the year we know as 1 BC is year 0, 2 BC is year -1, 3 BC is year -2 and so on. We do not follow ISO 8601 with regard to the handling of BC years. Our date predicates will accept and interpret an input year 0 as 1 BC; however, a negative year, Year, should always be interpreted as $\text{abs}(\text{Year}) ::= \text{Year BC}$. We believe that the average person will find our handling of BC years more user-friendly than the ISO 8601 one, but we encourage feedback from users with a view to a possible change in future versions.
- Week numbers: It is possible for a day (date) to have a week number that belongs to another year. Up to three of the first days of a calendar year may belong to the last week (number) of the prior calendar year, and up to three days of the last days of a calendar year may belong to the first week (number) of the next calendar year. It for this reason that the Week parameter in date/6-7 is a compound term, namely week(WeekNo,ActualYear).
- Computation of Gregorian Easter Sunday: The algorithm is based upon the “Gaussian rule”. Proleptic use is limited to years > 1582 AD, that is, after the introduction of the Gregorian calendar.
- Some Christian feast day offsets from Easter Sunday: Carnival Monday: -48 days, Mardi Gras (Shrove Tuesday): -47 days, Ash Wednesday: -46 days, Palm Sunday: -7 days, Easter Friday: -2 days, Easter Saturday: -1 day, Easter Monday: +1 day, Ascension of Christ: +39 days, Whitsunday: +49 days, Whitmonday: +50 days, Feast of Corpus Christi: +60 days.

Inherited public predicates:

(none)

- Public predicates
 - date/4
 - date/5
 - date/6
 - date/7
 - date_string/3
 - valid_date/3
 - leap_year/1
 - calendar_month/3
 - easter_day/3
- Protected predicates
- Private predicates
- Operators

Public predicates

date/4

Get the system date and/or its Julian Day # or convert a Julian Day # to/from given date parts.

Compilation flags:

static

Template:

date(JD,Year,Month,Day)

JD - Julian day serial number.

Year - 0 or negative if converted BC year, positive otherwise.

Month - Normally an integer between 1 and 12 inclusive.

Day - Normally an integer between 1 and 31 inclusive depending upon month.

Mode and number of proofs:

date(?integer,?integer,?integer,?integer) - zero_or_one

Examples:

Current date (i.e., today)

date(JD,Year,Month,Day)

JD=2453471,Year=2005,Month=4,Day=10

Convert a date to its Julian day number

date(JD,2000,2,29)

JD=2451604

Convert a Julian day number to its date

```

date(2451604,Year,Month,Day)
Year=2000,Month=2,Day=29
What is the date of day # 60 in year 2000?
date(JD,2000,1,60)
JD=2451604
What is the Julian of the 1st day prior to 2000-1-1?
date(JD,2000,1,0)
JD=2451544
What is the Julian of the 60th day prior to 2000-1-1?
date(JD,2000,1,-59)
JD=2451485
Illegal date is auto-adjusted (see also next query)
date(JD,1900,2,29)
JD=2415080
This is the correct date!
date(2415080,Year,Month,Day)
Year=1900,Month=3,Day=1

```

date/5

Ditto date/4 + get/check its day-of-week #.

Compilation flags:

```
static
```

Template:

```
date(JD,Year,Month,Day,DoW)
JD - Julian day serial number.
Year - 0 or negative if converted BC year, positive otherwise.
Month - Normally an integer between 1 and 12 inclusive.
Day - Normally an integer between 1 and 31 inclusive depending upon month.
DoW - Day of week, where Monday=1, Tuesday=2, ..., Sunday=7.
```

Mode and number of proofs:

```
date(?integer,?integer,?integer,?integer,?integer) - zero_or_one
```

Examples:

```

Get the Julian and the day-of-week # of a date
date(JD,2000,2,29,DoW)
JD=2451604,DoW=2
Check the validity of a given date (day-of-week is 2, not 4)
date(_,2002,3,5,4)
no

```

Get the Julian day of a given date if it is a Sunday

```
date(JD,2004,2,29,7)
```

```
JD=2453065
```

Get the date and day-of-week # of a Julian

```
date(2451545,Year,Month,Day,DoW)
```

```
Year=2000,Month=1,Day=1,DoW=6
```

date/6

Ditto date/5 + get/check its week #.

Compilation flags:

```
static
```

Template:

```
date(JD,Year,Month,Day,DoW,Week)
```

JD - Julian day serial number.

Year - 0 or negative if converted BC year, positive otherwise.

Month - Normally an integer between 1 and 12 inclusive.

Day - Normally an integer between 1 and 31 inclusive depending upon month.

DoW - Day of week, where Monday=1, Tuesday=2, ..., Sunday=7.

Week - Compound term, week(WeekNo,ActualYear), of a day.

Mode and number of proofs:

```
date(?integer,?integer,?integer,?integer,?integer,?compound) - zero_or_one
```

Examples:

Get the day-of-week and week number of a date

```
date(_,2000,1,1,DoW,Week)
```

```
DoW=6,Week=week(52,1999)
```

Get the week number and year of this week

```
date(_,_,_,_,Week)
```

```
Week=week(7,2004)
```

Get the Julian number and the week of a date if it is a Sunday

```
date(JD,2004,2,29,7,Week)
```

```
JD=2453065,Week=week(9,2004)
```

Get the day-of-week and week of a Julian day number

```
date(2453066,_,_,_,DoW,Week)
```

```
DoW=1,Week=week(10,2004)
```

Check that given date data matches

```
date(_,2004,3,1,1,week(10,2004))
```

```
yes
```

What is the date of a day of week (default is 1) in given week # and year?

```

date(__,Year,Month,Day,DoW,week(26,2004))
Year=2004,Month=6,Day=21,DoW=1
Ditto for Sunday
date(__,Year,Month,Day,7,week(1,2005))
Year=2005,Month=1,Day=9
Ditto for Tuesday in following week
date(__,Year,Month,Day,9,week(1,2005))
Year=2005,Month=1,Day=11
Ditto for Thursday in the prior week
date(__,Year,Month,Day,4,week(0,2005))
Year=2004,Month=12,Day=30
Ditto for Tuesday two weeks prior
date(__,Year,Month,Day,2,week(-1,2005))
Year=2004,Month=12,Day=21
Ditto for Saturday
date(__,Year,Month,Day,6,week(53,2004))
Year=2005,Month=1,Day=1
Ditto for Monday (note automatic compensation of nonexistent week number)
date(__,Year,Month,Day,1,week(60,2004))
Year=2005,Month=2,Day=14

```

date/7

Ditto date/6 + get/check its day-of-year #.

Compilation flags:

static

Template:

```

date(JD,Year,Month,Day,DoW,Week,DoY)
  JD - Julian day serial number.
  Year - 0 or negative if converted BC year, positive otherwise.
  Month - Normally an integer between 1 and 12 inclusive.
  Day - Normally an integer between 1 and 31 inclusive depending upon month.
  DoW - Day of week, where Monday=1, Tuesday=2, ..., Sunday=7.
  Week - Compound term, week(WeekNo,ActualYear), of a day.
  DoY - Day of year (NB! calendar year, not week # year).

```

Mode and number of proofs:

```

date(?integer,?integer,?integer,?integer,?integer,?compound,?integer) - zero_or_one

```

Examples:

Get the date and day-of-year of a Julian number

```
date(2451649,Year,Month,Day,_,_,DoY)
Year=2000,Month=4,Day=14,DoY=105
Get the Julian number, week number and day-of-year of a date, confirming that it is a Sunday
date(JD,2004,2,29,7,Week,DoY)
JD=2453065,Week=week(9,2004),DoY=60
Confirm that a date is, in fact, a specific day-of-year
date(_,2004,3,1,_,_,61)
yes
Get the Julian number, week day and day-of-year of a date
date(JD,2004,10,18,DoW,_,DoY)
JD=2453297,DoW=1,DoY=292
Get today's day-of-year
date(_,_,_,_,_,DoY)
DoY=54
Get all missing date data (excl. Julian number) for the 60th calendar day of 2004
date(_,2004,Month,Day,DoW,Week,60)
Month=2,Day=29,DoW=7,Week=week(9,2004)
Match given date data and, if true, return the missing data (excl. Julian number)
date(_,2004,3,Day,DoW,Week,61)
Day=1,DoW=1,Week=week(10,2004)
Ditto (the 61st day-of-year cannot be both day 1 and 2 of the month)
date(_,2004,_,2,_,_,61)
no
```

date_string/3

Conversion between an ISO 8601 compliant date string and its components (truncated and expanded date representations are currently unsupported). Note that date components are not validated; that is the caller's responsibility!

Compilation flags:

```
static
```

Template:

```
date_string(Format,Components,String)
```

Format - ISO 8601 format.

Components - When bound and String is free, either a Julian number or a [Year,Month,Day] term; it binds to the system day/date if free When free and String is bound, it binds to an integer list representing the numeric elements of String.

String - ISO 8601 formatted string correspondent to Components.

Mode and number of proofs:

```
date_string(+atom,+integer,?atom) - zero_or_one
```

```
date_string(+atom,?list,?atom) - zero_or_one
```


Examples:

```

Date, complete, basic (section 5.2.1.1)
date_string('YYYYMMDD',[2004,2,29],String)
String='20040229'

Date, complete, basic (section 5.2.1.1)
date_string('YYYYMMDD',Components,'20040229')
Components=[2004,2,29]

Date, complete, extended (section 5.2.1.1)
date_string('YYYY-MM-DD',[2003,12,16],String)
String='2003-12-16'

Date, complete, extended (section 5.2.1.1)
date_string('YYYY-MM-DD',Components,'2003-12-16')
Components=[2003,12,16]

Date, complete, extended (section 5.2.1.1)
date_string('YYYY-MM-DD',_,String)
String='2004-02-17'

Date, complete, extended (section 5.2.1.1)
date_string('YYYY-MM-DD',Components,'2004-02-17')
Components=[2004,2,17]

Date, reduced, month (section 5.2.1.2 a)
date_string('YYYY-MM',[2004,9,18],String)
String='2004-09'

Date, reduced, month (section 5.2.1.2 a)
date_string('YYYY-MM',Components,'2004-09')
Components=[2004,9]

Date, reduced, year (section 5.2.1.2 b)
date_string('YYYY',[1900,7,24],String)
String='1900'

Date, reduced, year (section 5.2.1.2 b)
date_string('YYYY',Components,'1900')
Components=[1900]

Date, reduced, century (section 5.2.1.2 c)
date_string('YY',2456557,String)
String='20'

Date, reduced, century (section 5.2.1.2 c)
date_string('YY',Components,'20')
Components=[20]

Date, ordinal, complete (section 5.2.2.1)
date_string('YYYYDDD',[2005,3,25],String)
String='2005084'

Date, ordinal, complete (section 5.2.2.1)
date_string('YYYYDDD',Components,'2005084')
Components=[2005,84]

Date, ordinal, extended (section 5.2.2.1)
date_string('YYYY-DDD',[1854,12,4],String)
String='1854-338'

Date, ordinal, extended (section 5.2.2.1)

```

```
date_string('YYYY-DDD',Components,'1854-338')
Components=[1854,338]
Week, complete, basic (section 5.2.3.1)
date_string('YYYYWwwD',[2000,1,2],String)
String='1999W527'
Week, complete, basic (section 5.2.3.1)
date_string('YYYYWwwD',Components,'1999W527')
Components=[1999,52,7]
Week, complete, extended (section 5.2.3.1)
date_string('YYYY-Www-D',[2003,12,29],String)
String='2004-W01-1'
Week, complete, extended (section 5.2.3.1)
date_string('YYYY-Www-D',Components,'2004-W01-1')
Components=[2004,1,1]
Week, complete, extended (section 5.2.3.1)
date_string('YYYY-Www-D',2453167,String)
String='2004-W24-4'
Week, complete, extended (section 5.2.3.1)
date_string('YYYY-Www-D',Components,'2004-W24-4')
Components=[2004,24,4]
Week, reduced, basic (section 5.2.3.2)
date_string('YYYYWww',[2004,2,29],String)
String='2004W09'
Week, reduced, basic (section 5.2.3.2)
date_string('YYYYWww',Components,'2004W09')
Components=[2004,9]
Week, reduced, extended (section 5.2.3.2)
date_string('YYYY-Www',[2004,2,29],String)
String='2004-W09'
Week, reduced, extended (section 5.2.3.2)
date_string('YYYY-Www',Components,'2004-W09')
Components=[2004,9]
```

`valid_date/3`

Validate a given date in the Gregorian calendar.

Compilation flags:

`static`

Template:

`valid_date(Year,Month,Day)`

Mode and number of proofs:

```
valid_date(+integer,+integer,+integer) - zero_or_one
```

Examples:

Yes, the recent millennium was a leap year

```
valid_date(2000,2,29)
```

```
yes
```

2004 was also a leap year

```
valid_date(2004,2,29)
```

```
yes
```

Only 30 days in April

```
valid_date(2004,4,31)
```

```
no
```

1 BC was a leap year

```
valid_date(-1,2,29)
```

```
yes
```

```
leap_year/1
```

Succeed if given year is a leap year in the Gregorian calendar.

Compilation flags:

```
static
```

Template:

```
leap_year(Year)
```

Year - The Gregorian calendar year to investigate. If free, it binds to the system year.

Mode and number of proofs:

```
leap_year(?integer) - zero_or_one
```

Examples:

No, the prior centenary was not a leap year

```
leap_year(1900)
```

```
no
```

The recent millennium

```
leap_year(2000)
```

```
yes
```

This year

```
leap_year(Year)
```

```
Year=2004
```

This year (equivalent to prior query)

```
leap_year(_)
```

```
    yes
Next centennial
    leap_year(2100)
    no
Year 0, equivalent to 1 BC
    leap_year(0)
    yes
1 BC
    leap_year(-1)
    yes
4 BC
    leap_year(-4)
    no
5 BC
    leap_year(-5)
    yes
```

calendar_month/3

Compute a calendar month.

Compilation flags:

```
static
```

Template:

```
calendar_month(Year,Month,Calendar)
```

Year - The calendar year.

Month - The calendar month.

Calendar - A compound term, m/3, composed of three main arguments specifying year, month, and a list of week and week day numbers (calendar body).

Mode and number of proofs:

```
calendar_month(?integer,?integer,-compound) - zero_or_one
```

Examples:

Compute the calendar of March, 2005

```
calendar_month(2005,3,Calendar)
```

```
Calendar=m(2005,3,[w(9,[0,1,2,3,4,5,6]),w(10,[7,8,9,10,11,12,13]),w(11,[14,15,16,17,18,19,20]),w(12,[21,22,23,24,25,26,27]),w(13,[28,29,30,31,0,0,0]),w(0,[0,0,0,0,0,0])])
```

easter_day/3

Compute a Gregorian Easter Sunday.

Compilation flags:

static

Template:

easter_day(Year,Month,Day)

Year - Integer specifying the year to be investigated.

Month - Month in which Easter Sunday falls for given year.

Day - Day of month in which Easter Sunday falls for given year.

Mode and number of proofs:

easter_day(?integer,-integer,-integer) - zero_or_one

Examples:

Compute Easter Sunday for a particular year

easter_day(2006,Month,Day)

Month=4,Day=16

Compute Easter Sunday for the current year

easter_day(Year,Month,Day)

Year=2005,Month=3,Day=27

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.39 issue_creator

object

1.39.1 issue_creator

Support for automatically creating bug report issues for failed tests in GitHub or GitLab servers.

Availability:

```
logtalk_load(issue_creator(loader))
```

Author: Paulo Moura

Version: 0:12:0

Date: 2022-01-20

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::message_hook/4
```

Uses:

```
git
```

```
os
```

```
term_io
```

```
user
```

Remarks:

- Usage: This tool is automatically loaded and used from the `logtalk_tester` automation script when using its `-b` option. See the script man page for details.

Inherited public predicates:

```
(none)
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.40 java

object

1.40.1 java

Abstract interface to JPL API utility predicates.

Availability:

`logtalk_load(java(loader))`

Author: Paulo Moura

Version: 1:8:0

Date: 2023-03-15

Compilation flags:

`static, context_switching_calls`

Implements:

`public java_utils_protocol`

Uses:

`user`

Remarks:

(none)

Inherited public predicates:

array_list/2 array_to_list/2 array_to_terms/2 array_to_terms/3 decode_exception/2
decode_exception/3 false/1 is_false/1 is_null/1 is_object/1 is_true/1 is_void/1
iterator_element/2 list_to_array/2 map_element/2 null/1 set_element/2 terms_to_array/2
true/1 value_reference/2 void/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

java(Reference,ReturnValue), java(Reference), java_hook
object

1.40.2 java(Reference)

- Reference - Either a class name or a Java reference to an object.

Minimal abstraction of the JPL API for calling Java from Logtalk using familiar message-sending syntax and a forward/1 handler to resolve methods.

Availability:

logtalk_load(java(loader))

Author: Paulo Moura and Sergio Castro

Version: 1:0:1

Date: 2019-06-13

Compilation flags:

static, context_switching_calls

Extends:

public java(Reference,_)

Remarks:

- Usage: Send to this object any valid message as listed in the JavaDocs for the given reference.

Inherited public predicates:

forward/1 get_field/2 invoke/1 invoke/2 new/1 new/2 set_field/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

java(Reference,ReturnValue), java, java_hook

object

1.40.3 java(Reference,ReturnValue)

- Reference - Either a class name or a Java reference to an object.
- ReturnValue - Value returned by a method call (possibly the Java value void).

Minimal abstraction of the JPL API for calling Java from Logtalk using familiar message-sending syntax and a forward/1 handler to resolve methods.

Availability:

```
logtalk_load(java(loader))
```

Author: Paulo Moura and Sergio Castro

Version: 1:4:0

Date: 2023-03-13

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public forwarding  
public java_access_protocol
```

Remarks:

- Usage: Send to this object any valid message as listed in the JavaDocs for the given reference.

Inherited public predicates:

```
forward/1 get_field/2 invoke/1 invoke/2 new/1 new/2 set_field/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[java\(Reference\)](#), [java](#), [java_hook](#)
protocol

1.40.4 java_access_protocol

Protocol for a minimal abstraction for calling Java from Logtalk using familiar message-sending syntax.

Availability:

```
logtalk_load(java(loader))
```

Author: Paulo Moura and Sergio Castro

Version: 1:2:1

Date: 2023-03-16

Compilation flags:

```
static
```

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - get_field/2
 - set_field/2
 - new/2
 - new/1
 - invoke/1
 - invoke/2
- Protected predicates
- Private predicates
- Operators

Public predicates

get_field/2

Gets the value of a class or object field.

Compilation flags:

static

Template:

get_field(Field,Value)

Mode and number of proofs:

get_field(+atom,?nonvar) - zero_or_one

set_field/2

Sets the value of a class or object field.

Compilation flags:

static

Template:

set_field(Field,Value)

Mode and number of proofs:

set_field(+atom,+nonvar) - one

new/2

Creates a new instance using the specified parameter values.

Compilation flags:

static

Template:

new(Parameters,Instance)

Mode and number of proofs:

new(+list(nonvar),-reference) - one

new/1

Creates a new instance using default parameter values.

Compilation flags:

static

Template:

new(Instance)

Mode and number of proofs:

new(-reference) - one

invoke/1

Invokes a method. This is a more efficient compared with relying on the forward/1 handler to resolve methods.

Compilation flags:

static

Template:

invoke(Method)

Mode and number of proofs:

invoke(@nonvar) - one

invoke/2

Invokes a method. This is a more efficient compared with relying on the forward/1 handler to resolve methods.

Compilation flags:

static

Template:

invoke(Functor,Arguments)

Mode and number of proofs:

invoke(@nonvar,@list) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.40.5 java_hook

Hook object to optimize messages to the java/1-2 objects that otherwise would trigger the forward/1 handler.

Availability:

logtalk_load(java(loader))

Author: Paulo Moura

Version: 1:0:1
Date: 2019-06-13

Compilation flags:
static, context_switching_calls

Implements:
public `expanding`

Remarks:

- Usage: Compile source files with messages to the java/1-2 objects using the compiler option `hook(java_hook)`.

Inherited public predicates:
`goal_expansion/2` `term_expansion/2`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

java(Reference,ReturnValue), java(Reference)

protocol

1.40.6 java_utils_protocol

Abstract interface to Java utility predicates.

Availability:

logtalk_load(java(loader))

Author: Paulo Moura

Version: 1:6:0

Date: 2023-03-13

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - value_reference/2
 - true/1
 - false/1
 - void/1
 - null/1
 - is_true/1
 - is_false/1

- is_void/1
- is_null/1
- is_object/1
- terms_to_array/2
- array_to_terms/3
- array_to_terms/2
- array_to_list/2
- list_to_array/2
- array_list/2
- iterator_element/2
- map_element/2
- set_element/2
- decode_exception/2
- decode_exception/3
- Protected predicates
- Private predicates
- Operators

Public predicates

value_reference/2

Returns an opaque term that represents the Java value with the given name.

Compilation flags:

static

Template:

value_reference(Value,Reference)

Mode and number of proofs:

value_reference(?atom,--ground) - one_or_more

true/1

Returns an opaque term that represents the Java value true.

Compilation flags:

static

Template:

true(Reference)

Mode and number of proofs:

true(--ground) - one

false/1

Returns an opaque term that represents the Java value false.

Compilation flags:

static

Template:

false(Reference)

Mode and number of proofs:

false(--ground) - one

void/1

Returns an opaque term that represents the Java value void.

Compilation flags:

static

Template:

void(Reference)

Mode and number of proofs:

void(--ground) - one

null/1

Returns an opaque term that represents the Java value null.

Compilation flags:

static

Template:

null(Reference)

Mode and number of proofs:

null(--ground) - one

is_true/1

True when the argument is the Java value true. Fails if the argument is not instantiated.

Compilation flags:

static

Template:

is_true(Reference)

Mode and number of proofs:

is_true(@term) - zero_or_one

is_false/1

True when the argument is the Java value false. Fails if the argument is not instantiated.

Compilation flags:

static

Template:

is_false(Reference)

Mode and number of proofs:

is_false(@term) - zero_or_one

is_void/1

True when the argument is the Java value void. Fails if the argument is not instantiated.

Compilation flags:

static

Template:

is_void(Reference)

Mode and number of proofs:

is_void(@term) - zero_or_one

is_null/1

True when the argument is the Java value null. Fails if the argument is not instantiated.

Compilation flags:

static

Template:

is_null(Reference)

Mode and number of proofs:

is_null(@term) - zero_or_one

is_object/1

True when the argument is a reference to a Java object. Fails if the argument is not instantiated.

Compilation flags:

static

Template:

is_object(Reference)

Mode and number of proofs:

is_object(@term) - zero_or_one

terms_to_array/2

Converts a list of ground Prolog terms to an array (a Java reference).

Compilation flags:

static

Template:

terms_to_array(Terms,Array)

Mode and number of proofs:

terms_to_array(++list(ground),-array) - one

array_to_terms/3

Converts an array (a Java reference) to a list of ground Prolog terms returning also its length. The array elements must be atoms, integers, floats, or compound terms. Fails otherwise.

Compilation flags:

static

Template:

array_to_terms(Array,Terms,Length)

Mode and number of proofs:

array_to_terms(+array,-list(ground),-integer) - one

array_to_terms/2

Converts an array (a Java reference) to a list of ground Prolog terms. The array elements must be atoms, integers, floats, or ground compound terms. Fails otherwise.

Compilation flags:

static

Template:

array_to_terms(Array,Terms)

Mode and number of proofs:

array_to_terms(+array,-list(term)) - one

`array_to_list/2`

Converts an array (a Java reference) to a list of Java references or their values.

Compilation flags:

`static`

Template:

`array_to_list(Array,List)`

Mode and number of proofs:

`array_to_list(+array,-list) - one`

`list_to_array/2`

Converts a list of Java references or values to an array (a Java reference).

Compilation flags:

`static`

Template:

`list_to_array(List,Array)`

Mode and number of proofs:

`list_to_array(+list,-array) - one`

`array_list/2`

Converts between an array (a Java reference) and a list of Java references or their values. Deprecated. Use the `array_to_list/2` and `list_to_array/2` predicates instead.

Compilation flags:

`static`

Template:

`array_list(Array,List)`

Mode and number of proofs:

array_list(+array,-list) - one

array_list(-array,+list) - one

iterator_element/2

Enumerates, by backtracking, all iterator elements.

Compilation flags:

static

Template:

iterator_element(Iterator,Element)

Mode and number of proofs:

iterator_element(+iterator,-element) - zero_or_more

map_element/2

Enumerates, by backtracking, all map elements.

Compilation flags:

static

Template:

map_element(Map,Element)

Mode and number of proofs:

map_element(+iterator,-element) - zero_or_more

set_element/2

Enumerates, by backtracking, all set elements.

Compilation flags:

static

Template:

set_element(Set,Element)

Mode and number of proofs:

set_element(+iterator,-element) - zero_or_more

decode_exception/2

Decodes an exception into its corresponding cause. Fails if the exception is not a Java exception.

Compilation flags:

static

Template:

decode_exception(Exception,Cause)

Mode and number of proofs:

decode_exception(+callable,-atom) - zero_or_one

decode_exception/3

Decodes an exception into its corresponding cause and a stack trace. Fails if the exception is not a Java exception.

Compilation flags:

static

Template:

decode_exception(Exception,Cause,StackTrace)

Mode and number of proofs:

decode_exception(+callable,-atom,-list(atom)) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.41 json

object

1.41.1 json

JSON parser and generator. Uses curly terms for parsed JSON objects, dashes for parsed JSON pairs, and atoms for parsed JSON strings.

Availability:

```
logtalk_load(json(loader))
```

Author: Paulo Moura and Jacinto Dávila

Version: 1:1:0

Date: 2022-11-14

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public json(curly,dash,atom)
```

Remarks:

(none)

Inherited public predicates:

```
generate/2 parse/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.41.2 json(StringRepresentation)

- StringRepresentation - Text representation to be used when decoding JSON strings. Possible values are atom (default), chars, and codes.

JSON parser and generator. Uses curly terms for parsed JSON objects and dashes for parsed JSON pairs.

Availability:

```
logtalk_load(json(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2022-11-14

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public json(curly,dash,StringRepresentation)
```

Remarks:

(none)

Inherited public predicates:

generate/2 parse/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.41.3 json(ObjectRepresentation,PairRepresentation,StringRepresentation)

- ObjectRepresentation - Object representation to be used when decoding JSON objects. Possible values are curly (default) and list.
- PairRepresentation - Pair representation to be used when decoding JSON objects. Possible values are dash (default), equal, and colon.
- StringRepresentation - Text representation to be used when decoding JSON strings. Possible values are atom (default), chars, and codes.

JSON parser and generator.

Availability:

logtalk_load(json(loader))

Author: Paulo Moura and Jacinto Dávila

Version: 0:13:0

Date: 2024-07-16

Compilation flags:

static, context_switching_calls

Implements:

public json_protocol

Uses:

reader

Remarks:

(none)

Inherited public predicates:

generate/2 parse/2

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.41.4 json_protocol

JSON parser and generator protocol.

Availability:

logtalk_load(json(loader))

Author: Paulo Moura and Jacinto Dávila

Version: 0:11:0

Date: 2022-11-09

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - parse/2
 - generate/2
- Protected predicates
- Private predicates
- Operators

Public predicates

parse/2

Parses the JSON contents read from the given source (codes(List), stream(Stream), line(Stream), file(Path), chars(List), or atom(Atom)) into a term. Fails if the JSON contents cannot be parsed.

Compilation flags:

static

Template:

parse(Source,Term)

Mode and number of proofs:

parse(++compound,--term) - one_or_error

generate/2

Generates the content using the representation specified in the first argument (codes(List), stream(Stream), file(Path), chars(List), or atom(Atom)) for the term in the second argument. Fails if this term cannot be processed.

Compilation flags:

static

Template:

generate(Sink,Term)

Mode and number of proofs:

generate(+compound,++term) - one_or_error

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.42 lgtdoc

object

1.42.1 lgtdoc

Documenting tool. Generates XML documenting files for loaded entities and for library, directory, entity, and predicate indexes.

Availability:

```
logtalk_load(lgtdoc(loader))
```

Author: Paulo Moura

Version: 11:1:2

Date: 2024-12-02

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public lgtdocp
```

Imports:

```
public options
```

Uses:

```
date
```

```
list
```

```
logtalk
```

```
os
```

```
type
```

```
user
```

```
varlist
```

Remarks:

(none)

Inherited public predicates:

all/0 all/1 check_option/1 check_options/1 default_option/1 default_options/1 directories/1
directories/2 directory/1 directory/2 file/1 file/2 files/1 files/2 fix_option/2 fix_options/2
libraries/1 libraries/2 library/1 library/2 merge_options/2 option/2 option/3 rdirectories/1
rdirectories/2 rdirectory/1 rdirectory/2 rlibraries/1 rlibraries/2 rlibrary/1 rlibrary/2
valid_option/1 valid_options/1

- Public predicates
- Protected predicates
- Private predicates
 - library_entity_/4
 - directory_entity_/4
 - type_entity_/4
 - predicate_entity_/4
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

library_entity_/4

Table of documented entities per library.

Compilation flags:

dynamic

Template:

library_entity_(Library,PrimarySortKey,SecondarySortKey,Entity)

Mode and number of proofs:

library_entity_(?atom,?nonvar,?nonvar,?atom) - zero_or_more

directory_entity_/4

Table of documented entities per directory.

Compilation flags:

dynamic

Template:

directory_entity__(Directory,PrimarySortKey,SecondarySortKey,Entity)

Mode and number of proofs:

directory_entity__(?atom,?nonvar,?nonvar,?atom) - zero_or_more

type_entity_/4

Table of documented entities per type.

Compilation flags:

dynamic

Template:

type_entity__(Type,PrimarySortKey,SecondarySortKey,Entity)

Mode and number of proofs:

type_entity__(?atom,?nonvar,?nonvar,?atom) - zero_or_more

predicate_entity_/4

Table of public predicates for all documented entities.

Compilation flags:

dynamic

Template:

predicate_entity__(Predicate,PrimarySortKey,SecondarySortKey,Entity)

Mode and number of proofs:

predicate_entity__(?predicate_indicator,?nonvar,?nonvar,?entity_identifier) - zero_or_more

Operators

(none)

category

1.42.2 lgtdoc_messages

Logtalk documentation tool default message translations.

Availability:

```
logtalk_load(lgtdoc(loader))
```

Author: Paulo Moura

Version: 4:0:1

Date: 2024-12-02

Compilation flags:

```
static
```

Provides:

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.42.3 lgtdocp

Documenting tool protocol.

Availability:

```
logtalk_load(lgtdoc(loader))
```

Author: Paulo Moura

Version: 6:0:0

Date: 2024-03-08

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- Compiling files for generating XML documentation: All source files must be compiled with the `source_data` flag turned on.
- `xml_spec(Specification)` option: XML documenting files specification format. Possible option values are `dtd` (DTD specification; default) and `xsd` (XML Schema specification).
- `xml_spec_reference(Reference)` option: Reference to the XML specification file in XML documenting files. Possible values are `local` (default; DTD/XSD file in same folder as XML files), `web` (logtalk.org website DTD/XSD file), and `standalone` (no reference to specification files).

- `entity_xsl_file`(File) option: XSLT file to use with generated XML documenting files. Default is `logtalk_entity_to_xml.xsl`, allowing the XML files to be viewed by opening them with a browser supporting XSLT (after running the `lgt2xml.sh` script on the output directory).
- `index_xsl_file`(File) option: XSLT file to use with generated XML documenting files. Default is `logtalk_index_to_xml.xsl`, allowing the XML files to be viewed by opening them with a browser supporting XSLT (after running the `lgt2xml.sh` script on the output directory).
- `xml_docs_directory`(Directory) option: Directory where the XML documenting files will be generated. The default value is `./xml_docs`, a sub-directory of the source files directory.
- `bom`(Boolean) option: Defines if a BOM should be added to the generated XML documenting files.
- `encoding`(Encoding) option: Encoding to be used for the generated XML documenting files.
- `omit_path_prefixes`(Prefixes) option: List of path prefixes (atoms) to omit when writing directory paths. The default value is to omit the home directory.
- `exclude_files`(List) option: List of files to exclude when generating the XML documenting files.
- `exclude_paths`(List) option: List of relative library paths to exclude when generating the XML documenting files (default is []). All sub-directories of the excluded directories are also excluded.
- `exclude_prefixes`(List) option: List of path prefixes to exclude when generating the XML documenting files (default is []).
- `exclude_entities`(List) option: List of entities to exclude when generating the XML documenting files (default is []).
- `sort_predicates`(Boolean) option: Sort entity predicates (default is false).
- Known issues: Some options may depend on the used XSL processor. Most XSL processors support DTDs but only some of them support XML Schemas. Some processors (e.g., `fop2`) reject reference to a DTD.

Inherited public predicates:

(none)

- Public predicates
 - `rlibraries/2`
 - `rlibraries/1`
 - `rlibrary/2`
 - `rlibrary/1`
 - `libraries/2`
 - `libraries/1`
 - `library/2`
 - `library/1`
 - `rdirectories/2`
 - `rdirectories/1`
 - `rdirectory/2`

- rdirectory/1
- directories/2
- directories/1
- directory/2
- directory/1
- files/2
- files/1
- file/2
- file/1
- all/1
- all/0
- Protected predicates
- Private predicates
- Operators

Public predicates

rlibraries/2

Creates XML documenting files for all entities in all given libraries and their sub-libraries using the specified options.

Compilation flags:

static

Template:

rlibraries(Libraries,Options)

Mode and number of proofs:

rlibraries(+list(atom),+list) - one

rlibraries/1

Creates XML documenting files for all entities in all given libraries and their sub-libraries using default options.

Compilation flags:

static

Template:

rlibraries(Libraries)

Mode and number of proofs:

rlibraries(+list(atom)) - one

rlibrary/2

Creates XML documenting files for all entities in a library and its sub-libraries using the specified options.

Compilation flags:

static

Template:

rlibrary(Library,Options)

Mode and number of proofs:

rlibrary(+atom,+list) - one

Examples:

Generate XML documenting files for all tool entities for later conversion to Markdown files

```
rlibrary(tools,[xslfile('lgtmd.xml')])
```

```
yes
```

rlibrary/1

Creates XML documenting files for all entities in a library and its sub-libraries using default options.

Compilation flags:

static

Template:

rlibrary(Library)

Mode and number of proofs:

rlibrary(+atom) - one

Examples:

Generate XML documenting files for all tool entities for direct viewing in a browser (after indexing using the lgt2xml script)

rlibrary(tools)

yes

libraries/2

Creates XML documenting files for all entities in all given libraries using the specified options.

Compilation flags:

static

Template:

libraries(Libraries,Options)

Mode and number of proofs:

libraries(+list(atom),+list) - one

libraries/1

Creates XML documenting files for all entities in all given libraries using default options.

Compilation flags:

static

Template:

libraries(Libraries)

Mode and number of proofs:

libraries(+list(atom)) - one

library/2

Creates XML documenting files for all entities in a library using the specified options.

Compilation flags:

static

Template:

library(Library,Options)

Mode and number of proofs:

library(+atom,+list) - one

Examples:

Generate XML documenting files for all library entities for later conversion to PDF A4 files

```
library(library,[xslfile('logtalk_entity_to_pdf_a4.xml')])
yes
```

library/1

Creates XML documenting files for all entities in a library using default options.

Compilation flags:

static

Template:

library(Library)

Mode and number of proofs:

library(+atom) - one

rdirectories/2

Creates XML documenting files for all entities in all given directories and their sub-directories using the specified options.

Compilation flags:

static

Template:

rdirectories(Directories,Options)

Mode and number of proofs:

rdirectories(+list(atom),+list) - one

rdirectories/1

Creates XML documenting files for all entities in all given directories and their sub-directories using default options.

Compilation flags:

static

Template:

rdirectories(Directories)

Mode and number of proofs:

rdirectories(+list(atom)) - one

rdirectory/2

Creates XML documenting files for all entities in a directory and its sub-directories using the specified options.

Compilation flags:

static

Template:

rdirectory(Directory,Options)

Mode and number of proofs:

rdirectory(+atom,+list) - one

Examples:

Generate XML documenting files for all entities in the tools directory for later conversion to Markdown files

```
rdirectory('./tools',[xslfile('lgtmd.xml')])
yes
```

rdirectory/1

Creates XML documenting files for all entities in a directory and its sub-directories using default options.

Compilation flags:

static

Template:

rdirectory(Directory)

Mode and number of proofs:

rdirectory(+atom) - one

Examples:

Generate XML documenting files for all entities in the tools directory for direct viewing in a browser (after indexing using the lgt2xml script)

```
rdirectory('./tools')
yes
```

directories/2

Creates XML documenting files for all entities in all given directories using the specified options.

Compilation flags:

static

Template:

directories(Directories,Options)

Mode and number of proofs:

directories(+list(atom),+list) - one

directories/1

Creates XML documenting files for all entities in all given directories using default options.

Compilation flags:

static

Template:

directories(Directories)

Mode and number of proofs:

directories(+list(atom)) - one

directory/2

Creates XML documenting files for all entities in a directory using the specified options.

Compilation flags:

static

Template:

directory(Directory,Options)

Mode and number of proofs:

directory(+atom,+list) - one

Examples:

Generate XML documenting files for all the entities in the current directory for later conversion to PDF A4 files

```
directory('.',[xslfile('logtalk_entity_to_pdf_a4.xsl')])
yes
```

directory/1

Creates XML documenting files for all entities in a directory using default options.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

files/2

Creates XML documenting files for all entities in loaded source files using the specified options. The files can be given by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

files(Files,Options)

Mode and number of proofs:

files(+list(atom),+list) - one

files/1

Creates XML documenting files for all entities in loaded source files using default options. The files can be given by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

files(Files)

Mode and number of proofs:

files(+list(atom)) - one

file/2

Creates XML documenting files for all entities in a loaded source file using the specified options. The file can be given by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

file(File,Options)

Mode and number of proofs:

file(+atom,+list) - one

file/1

Creates XML documenting files for all entities in a loaded source file using default options. The file can be given by name, basename, full path, or using library notation.

Compilation flags:

static

Template:

file(File)

Mode and number of proofs:

file(+atom) - one

all/1

Creates XML documenting files for all loaded entities using the specified options.

Compilation flags:

static

Template:

all(Options)

Mode and number of proofs:

all(+list) - one

all/0

Creates XML documenting files for all loaded entities using default options.

Compilation flags:

static

Mode and number of proofs:

all - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

lgtdoc

1.43 lgtunit

object

1.43.1 automation_report

Intercepts unit test execution messages and generates a *.totals files for parsing by the logtalk_tester.sh automation shell script.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 5:0:0

Date: 2024-02-20

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Uses:

user

Remarks:

- Usage: Automatically loaded by the logtalk_tester.sh shell script.

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.43.2 `coverage_report`

Intercepts unit test execution messages and generates a `coverage_report.xml` file with a test suite code coverage results.

Availability:

```
logtalk_load(lgtunit(loader))
```

Author: Paulo Moura

Version: 3:2:0

Date: 2023-04-11

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::message_hook/4
```

Uses:

```
logtalk
```


user

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(coverage_report))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - `timestamp_/6`
 - `object_file_/2`
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

`timestamp_/6`

Cache of the starting tests timestamp.

Compilation flags:

dynamic

Template:

`timestamp_(Year,Month,Day,Hours,Minutes,Seconds)`

Mode and number of proofs:

`timestamp_(-integer,-integer,-integer,-integer,-integer,-integer) - one`

object_file_/2

Cache of test object - file pairs.

Compilation flags:

dynamic

Template:

object_file__(Object,File)

Mode and number of proofs:

object_file__(?object_identifier,?atom) - zero_or_more

Operators

(none)

object

1.43.3 lgtunit

A unit test framework supporting predicate clause coverage, determinism testing, input/output testing, property-based testing, and multiple test dialects.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 20:0:0

Date: 2024-12-09

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Provides:

logtalk::trace_event/2

Uses:

fast_random

list

logtalk

os
 type
 user

Remarks:

- Usage: Define test objects as extensions of the lgtunit object and compile their source files using the compiler option hook(lgtunit).
- Portability: Deterministic unit tests are currently not available when using Quintus Prolog as the backend compiler.
- Known issues: Parameter variables cannot currently be used in the definition of test options.

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
 - cover/1
 - run/0
 - run/1
 - run/2
 - run_test_sets/1
 - test/1
 - number_of_tests/1
 - deterministic/1
 - deterministic/2
 - assertion/1
 - assertion/2
 - quick_check/3
 - quick_check/2
 - quick_check/1
 - benchmark/2
 - benchmark_reified/3
 - benchmark/3
 - benchmark/4
 - variant/2
 - approximately_equal/2
 - approximately_equal/3

- essentially_equal/3
- tolerance_equal/4
- ==~ / 2
- epsilon/1
- Protected predicates
 - run_tests/0
 - run_tests/1
 - run_test_set/0
 - run_quick_check_tests/5
 - condition/0
 - setup/0
 - cleanup/0
 - make/1
 - note/1
 - file_path/2
 - suppress_text_output/0
 - suppress_binary_output/0
 - set_text_input/3
 - set_text_input/2
 - set_text_input/1
 - check_text_input/2
 - check_text_input/1
 - text_input_assertion/3
 - text_input_assertion/2
 - clean_text_input/0
 - set_binary_input/3
 - set_binary_input/2
 - set_binary_input/1
 - check_binary_input/2
 - check_binary_input/1
 - binary_input_assertion/3
 - binary_input_assertion/2
 - clean_binary_input/0
 - set_text_output/3
 - set_text_output/2

- set_text_output/1
- check_text_output/3
- check_text_output/2
- check_text_output/1
- text_output_assertion/4
- text_output_assertion/3
- text_output_assertion/2
- text_output_contents/3
- text_output_contents/2
- text_output_contents/1
- clean_text_output/0
- set_binary_output/3
- set_binary_output/2
- set_binary_output/1
- check_binary_output/2
- check_binary_output/1
- binary_output_assertion/3
- binary_output_assertion/2
- binary_output_contents/2
- binary_output_contents/1
- clean_binary_output/0
- create_text_file/3
- create_text_file/2
- create_binary_file/2
- check_text_file/3
- check_text_file/2
- text_file_assertion/4
- text_file_assertion/3
- check_binary_file/2
- binary_file_assertion/3
- clean_file/1
- clean_directory/1
- closed_input_stream/2
- closed_output_stream/2
- stream_position/1

- test/2
- Private predicates
 - running_test_sets_/0
 - test/3
 - auxiliary_predicate_counter_/1
 - test_/2
 - selected_test_/1
 - skipped_/1
 - passed_/3
 - failed_/3
 - flaky_/1
 - fired_/3
 - covered_/4
- Operators
 - op(700,xfx,==)

Public predicates

cover/1

Declares entities being tested for which code coverage information should be collected.

Compilation flags:

static

Template:

cover(Entity)

Mode and number of proofs:

cover(?entity_identifier) - zero_or_more

run/0

Runs the unit tests, writing the results to the current output stream.

Compilation flags:

static

Mode and number of proofs:

run - one

run/1

Runs a unit test or a list of unit tests, writing the results to the current output stream. Runs the global setup and cleanup steps when defined. Fails when given a partial list of tests or when one of the test identifiers is not valid.

Compilation flags:

static

Template:

run(Tests)

Mode and number of proofs:

run(++callable) - zero_or_one

run(++list(callable)) - zero_or_one

run/2

Runs the unit tests, writing the results to the specified file. Mode can be either write (to create a new file) or append (to add results to an existing file).

Compilation flags:

static

Template:

run(File,Mode)

Mode and number of proofs:

run(+atom,+atom) - one

`run_test_sets/1`

Runs two or more test sets as a unified set generating a single code coverage report if one is requested. When there is a single test set, it is equivalent to sending the message `run/0` to the test set. Trivially succeeds when the argument is an empty list.

Compilation flags:

`static`

Template:

`run_test_sets(TestObjects)`

Mode and number of proofs:

`run_test_sets(+list(object)) - one`

Exceptions:

TestObjects is a partial list or a list with an element which is a variable:

`instantiation_error`

TestObjects is neither a partial list nor a list:

`type_error(list(object),TestObjects)`

An element TestObject of the TestObjects list is not an existing object:

`existence_error(object,TestObject)`

`test/1`

Enumerates, by backtracking, the identifiers of all defined unit tests.

Compilation flags:

`static`

Template:

`test(Identifier)`

Mode and number of proofs:

`test(?callable) - zero_or_more`

`number_of_tests/1`

Number of defined unit tests.

Compilation flags:

`static`

Template:

`number_of_tests(NumerOfTests)`

Mode and number of proofs:

`number_of_tests(?integer) - zero_or_one`

`deterministic/1`

True if the goal succeeds once without leaving choice-points.

Compilation flags:

`static`

Template:

`deterministic(Goal)`

Meta-predicate template:

`deterministic(0)`

Mode and number of proofs:

`deterministic(+callable) - zero_or_one`

`deterministic/2`

Reified version of the `deterministic/1` predicate. True if the goal succeeds. Returns a boolean value (true or false) indicating if the goal succeeded without leaving choice-points.

Compilation flags:

`static`

Template:

`deterministic(Goal,Deterministic)`

Meta-predicate template:

deterministic(0,*)

Mode and number of proofs:

deterministic(+callable,--atom) - zero_or_one

assertion/1

True if the assertion goal succeeds. Throws an error using the assertion goal as argument if the assertion goal throws an error or fails.

Compilation flags:

static

Template:

assertion(Assertion)

Meta-predicate template:

assertion(::)

Mode and number of proofs:

assertion(@callable) - one

Exceptions:

Assertion goal fails:

assertion_failure(Assertion)

Assertion goal throws Error:

assertion_error(Assertion,Error)

assertion/2

True if the assertion goal succeeds. Throws an error using the description as argument if the assertion goal throws an error or fails. The description argument helps to distinguish between different assertions in the same test body.

Compilation flags:

static

Template:

assertion(Description,Assertion)

Meta-predicate template:

assertion(*,0)

Mode and number of proofs:

assertion(+nonvar,@callable) - one

Exceptions:

Assertion goal fails:

assertion_failure(Description)

Assertion goal throws Error:

assertion_error(Description,Error)

quick_check/3

Reified version of the quick_check/2 predicate. Reports passed(SequenceSeed,Discarded,Labels), failed(Goal,SequenceSeed,TestSeed), error(Error,Goal,SequenceSeed,TestSeed), or broken(Why,Culprit). Goal is the failed test.

Compilation flags:

static

Template:

quick_check(Template,Result,Options)

Meta-predicate template:

quick_check(:,*,::)

Mode and number of proofs:

quick_check(@callable,-callable,++list(compound)) - one

Remarks:

- SequenceSeed argument: Can be used to re-run the same exact sequence of pseudo-random tests by using the rs/1 option after changes to the code being tested.
- TestSeed argument: Can be used to re-run the test that failed by using the rs/1 option after changes to the code being tested.
- Discarded argument: Number of generated tests that were discarded for failing to comply a pre-condition specified using the pc/1 option.
- Labels argument: List of pairs Label-N where N is the number of generated tests that are classified as Label by a closure specified using the l/1 option.
- broken(Why,Culprit) result: This result signals a broken setup. For example, an invalid template, a broken pre-condition or label goal, or broken test generation.

quick_check/2

Generates and runs random tests for a predicate given its mode template and a set of options. Fails when a generated test fails printing the test. Also fails on an invalid option, printing the option.

Compilation flags:

static

Template:

quick_check(Template,Options)

Meta-predicate template:

quick_check(:,:::)

Mode and number of proofs:

quick_check(@callable,++list(compound)) - zero_or_one

Remarks:

- Number of tests: Use the `n(NumberOfTests)` option to specify the number of random tests. Default is 100.
 - Maximum number of shrink operations: Use the `s(MaxShrinks)` option to specify the number of shrink operations when a counter example is found. Default is 64.
 - Type edge cases: Use the `ec(Boolean)` option to specify if type edge cases are tested (before generating random tests). Default is true.
 - Starting seed: Use the `rs(Seed)` option to specify the random generator starting seed to be used when generating tests. No default. Seeds should be regarded as opaque terms.
 - Test generation filtering: Use the `pc/1` option to specify a pre-condition closure for filtering generated tests (extended with the test arguments; no default).
 - Generated tests classification: Use the `l/1` option to specify a label closure for classifying the generated tests (extended with the test arguments plus the labels argument; no default). The labelling predicate can return a single test label or a list of test labels.
 - Verbose test generation: Use the `v(Boolean)` option to specify verbose reporting of generated random tests. Default is false.
 - Progress bar: Use the `pb(Boolean, Tick)` option to print a progress bar for the executed tests, advancing at every Tick tests. Default is false. Only applies when the verbose option is false.
-

`quick_check/1`

Generates and runs random tests using default options for a predicate given its mode template. Fails when a generated test fails printing the test.

Compilation flags:

`static`

Template:

`quick_check(Template)`

Mode and number of proofs:

`quick_check(@callable) - zero_or_one`

`benchmark/2`

Benchmarks a goal and returns the total execution time in seconds. Uses CPU clock. Goals that may throw an exception should be wrapped by the `catch/3` control construct.

Compilation flags:

`static`

Template:

`benchmark(Goal,Time)`

Meta-predicate template:

`benchmark(0,*)`

Mode and number of proofs:

`benchmark(+callable,-float) - one`

`benchmark_reified/3`

Benchmarks a goal and returns the total execution time in seconds plus its result (success, failure, or `error(Error)`). Uses CPU clock.

Compilation flags:

`static`

Template:

```
benchmark_reified(Goal,Time,Result)
```

Meta-predicate template:

```
benchmark_reified(0,*,*)
```

Mode and number of proofs:

```
benchmark_reified(+callable,-float,-callable) - one
```

benchmark/3

Benchmarks a goal by repeating it the specified number of times and returning the total execution time in seconds. Uses CPU clock. Goals that may throw an exception should be wrapped by the catch/3 control construct.

Compilation flags:

```
static
```

Template:

```
benchmark(Goal,Repetitions,Time)
```

Meta-predicate template:

```
benchmark(0,*,*)
```

Mode and number of proofs:

```
benchmark(@callable,+positive_integer,-float) - one
```

benchmark/4

Benchmarks a goal by repeating it the specified number of times and returning the total execution time in seconds using the given clock (cpu or wall). Goals that may throw an exception should be wrapped by the catch/3 control construct.

Compilation flags:

```
static
```

Template:

```
benchmark(Goal,Repetitions,Clock,Time)
```

Meta-predicate template:

```
benchmark(0,*,*,*)
```

Mode and number of proofs:

```
benchmark(@callable,+positive_integer,+atom,-float) - one
```

variant/2

True when the two arguments are a variant of each other. I.e. if is possible to rename the term variables to make them identical. Useful for checking expected test results that contain variables.

Compilation flags:

static

Template:

variant(Term1,Term2)

Mode and number of proofs:

variant(@term,@term) - zero_or_one

approximately_equal/2

Compares two numbers for approximate equality given the epsilon arithmetic constant value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) = < \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{epsilon}$. Type-checked.

Compilation flags:

static

Template:

approximately_equal(Number1,Number2)

Mode and number of proofs:

approximately_equal(+number,+number) - zero_or_one

approximately_equal/3

Compares two numbers for approximate equality given a user-defined epsilon value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) = < \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{Epsilon}$. Type-checked.

Compilation flags:

static

Template:

approximately_equal(Number1,Number2,Epsilon)

Mode and number of proofs:

approximately_equal(+number,+number,+number) - zero_or_one

Remarks:

- Epsilon range: Epsilon should be the epsilon arithmetic constant value or a small multiple of it. Only use a larger value if a greater error is expected.
 - Comparison with essential equality: For the same epsilon value, approximate equality is weaker requirement than essential equality.
-

essentially_equal/3

Compares two numbers for essential equality given an epsilon value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \min(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{Epsilon}$. Type-checked.

Compilation flags:

static

Template:

essentially_equal(Number1,Number2,Epsilon)

Mode and number of proofs:

essentially_equal(+number,+number,+number) - zero_or_one

Remarks:

- Comparison with approximate equality: For the same epsilon value, essential equality is a stronger requirement than approximate equality.
-

tolerance_equal/4

Compares two numbers for close equality given relative and absolute tolerances using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \max(\text{RelativeTolerance} * \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})), \text{AbsoluteTolerance})$. Type-checked.

Compilation flags:

static

Template:

tolerance_equal(Number1,Number2,RelativeTolerance,AbsoluteTolerance)

Mode and number of proofs:

tolerance_equal(+number,+number,+number,+number) - zero_or_one

`=~=/ 2`

Compares two numbers (or lists of numbers) for approximate equality using $100 \times \text{epsilon}$ for the absolute error and, if that fails, 99.999% accuracy for the relative error. But these precision values may not be adequate for all cases. Type-checked.

Compilation flags:

static

Template:

`=~=(Number1,Number2)`

Mode and number of proofs:

`=~=(+number,+number) - zero_or_one`

`=~=(+list(number),+list(number)) - zero_or_one`

`epsilon/1`

Returns the value of epsilon used in the definition of the `(=~/=)/2` predicate.

Compilation flags:

static

Template:

`epsilon(Epsilon)`

Mode and number of proofs:

`epsilon(-float) - one`

Protected predicates

run_tests/0

Runs all defined unit tests.

Compilation flags:
static

Mode and number of proofs:
run_tests - one

run_tests/1

Runs all the tests defined in the given file.

Compilation flags:
static

Template:
run_tests(File)
Mode and number of proofs:
run_tests(+atom) - one

run_test_set/0

Runs a test set as part of running two or more test sets as a unified set.

Compilation flags:
static

Mode and number of proofs:
run_test_set - one

`run_quick_check_tests/5`

Runs a QuickCheck test using the given options. Returns the starting seed used to generate the random tests, the number of discarded tests, and the test label statistics.

Compilation flags:

`static`

Template:

`run_quick_check_tests(Template,Options,Seed,Discarded,Labels)`

Meta-predicate template:

`run_quick_check_tests(:,::,*,*,*)`

Mode and number of proofs:

`run_quick_check_tests(@callable,+list,--nonvar,--number,--list(pair)) - one_or_error`

`condition/0`

Verifies conditions for running the tests. Defaults to the goal true.

Compilation flags:

`static`

Mode and number of proofs:

`condition - zero_or_one`

`setup/0`

Setup environment before running the test set. Defaults to the goal true.

Compilation flags:

`static`

Mode and number of proofs:

`setup - zero_or_one`

cleanup/0

Cleanup environment after running the test set. Defaults to the goal true.

Compilation flags:

static

Mode and number of proofs:

cleanup - zero_or_one

make/1

Make target for automatically running the test set when calling the logtalk_make/1 built-in predicate. No default. Possible values are all and check.

Compilation flags:

static

Template:

make(Target)

Mode and number of proofs:

make(?atom) - zero_or_one

note/1

Note to be printed after the test results. Defaults to the empty atom.

Compilation flags:

static

Template:

note(Note)

Mode and number of proofs:

note(?atom) - zero_or_one

`file_path/2`

Returns the absolute path for a file path that is relative to the tests object path. When the file path is already an absolute path, it is expanded to resolve any remaining relative file path parts.

Compilation flags:

`static`

Template:

`file_path(File,Path)`

Mode and number of proofs:

`file_path(+atom,-atom) - one`

See also:

`clean_file/1`

`clean_directory/1`

`suppress_text_output/0`

Suppresses text output. Useful to avoid irrelevant text output from predicates being tested to clutter the test logs.

Compilation flags:

`static`

Mode and number of proofs:

`suppress_text_output - one`

`suppress_binary_output/0`

Suppresses binary output. Useful to avoid irrelevant binary output from predicates being tested to clutter the test logs.

Compilation flags:

`static`

Mode and number of proofs:

`suppress_binary_output` - one

`set_text_input/3`

Creates a temporary file, in the same directory as the tests object, with the given text contents, and opens it for reading referenced by the given alias and using the additional options. If no `eof_action/1` option is specified, its value will be the default used by the backend compiler.

Compilation flags:

`static`

Template:

`set_text_input(Alias,Contents,Options)`

Mode and number of proofs:

`set_text_input(+atom,+atom,+list(stream_option))` - one

`set_text_input(+atom,+list(atom),+list(stream_option))` - one

See also:

`text_input_assertion/3`

`check_text_input/2`

`clean_text_input/0`

`set_text_input/2`

Creates a temporary file, in the same directory as the tests object, with the given text contents, and opens it for reading referenced by the given alias and using the default end-of-file action for the used backend compiler.

Compilation flags:

`static`

Template:

`set_text_input(Alias,Contents)`

Mode and number of proofs:

`set_text_input(+atom,+atom)` - one

`set_text_input(+atom,+list(atom))` - one

See also:

text_input_assertion/3
check_text_input/2
clean_text_input/0

set_text_input/1

Creates a temporary file, in the same directory as the tests object, with the given text contents, opens it for reading using the default end-of-file action for the used backend compiler, and sets the current input stream to the file.

Compilation flags:

static

Template:

set_text_input(Contents)

Mode and number of proofs:

set_text_input(+atom) - one

set_text_input(+list(atom)) - one

See also:

text_input_assertion/2
check_text_input/1
clean_text_input/0

check_text_input/2

Checks that the temporary file (referenced by the given alias) being read have the expected text contents.

Compilation flags:

static

Template:

check_text_input(Alias,Contents)

Mode and number of proofs:

check_text_input(+atom,+atom) - zero_or_one

See also:

```
set_text_input/2  
set_text_input/2  
text_input_assertion/3  
clean_text_input/0
```

check_text_input/1

Checks that the temporary file being read have the expected text contents.

Compilation flags:

```
static
```

Template:

```
check_text_input(Contents)
```

Mode and number of proofs:

```
check_text_input(+atom) - zero_or_one
```

See also:

```
set_text_input/1  
text_input_assertion/2  
clean_text_input/0
```

text_input_assertion/3

Returns an assertion for checking that the temporary file (referenced by the given alias) being read have the expected text contents.

Compilation flags:

```
static
```

Template:

```
text_input_assertion(Alias,Contents,Assertion)
```

Mode and number of proofs:

```
text_input_assertion(+atom,+atom,--callable) - one
```

See also:

```
set_text_input/3
```

`check_text_input/2`
`clean_text_input/0`

`text_input_assertion/2`

Returns an assertion for checking that the temporary file being read have the expected text contents.

Compilation flags:

`static`

Template:

`text_input_assertion(Contents,Assertion)`

Mode and number of proofs:

`text_input_assertion(+atom,--callable) - one`

See also:

`set_text_input/1`
`check_text_input/1`
`clean_text_input/0`

`clean_text_input/0`

Cleans the temporary file used when testing text input.

Compilation flags:

`static`

Mode and number of proofs:

`clean_text_input - one`

See also:

`set_text_input/3`
`set_text_input/2`
`set_text_input/1`

[set_binary_input/3](#)

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and opens it for reading referenced by the given alias and using the additional options. If no `eof_action/1` option is specified, its value will be the default used by the backend compiler.

Compilation flags:

`static`

Template:

`set_binary_input(Alias,Bytes,Options)`

Mode and number of proofs:

`set_binary_input(+atom,+list(byte),+list(stream_option)) - one`

See also:

[binary_input_assertion/3](#)

[check_binary_input/2](#)

[clean_binary_input/0](#)

[set_binary_input/2](#)

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and opens it for reading referenced by the given alias and using the default end-of-file action for the used backend compiler.

Compilation flags:

`static`

Template:

`set_binary_input(Alias,Bytes)`

Mode and number of proofs:

`set_binary_input(+atom,+list(byte)) - one`

See also:

[binary_input_assertion/3](#)

[check_binary_input/2](#)

[clean_binary_input/0](#)

`set_binary_input/1`

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and opens it for reading using the default end-of-file action for the used backend compiler, and sets the current input stream to the file.

Compilation flags:

`static`

Template:

`set_binary_input(Bytes)`

Mode and number of proofs:

`set_binary_input(+list(byte)) - one`

See also:

`binary_input_assertion/2`

`check_binary_input/1`

`clean_binary_input/0`

`check_binary_input/2`

Checks that the temporary file (referenced by the given alias) being read have the expected binary contents.

Compilation flags:

`static`

Template:

`check_binary_input(Alias,Bytes)`

Mode and number of proofs:

`check_binary_input(+atom,+list(byte)) - zero_or_one`

See also:

`set_binary_input/3`

`set_binary_input/2`

`binary_input_assertion/3`

`clean_binary_input/0`

[check_binary_input/1](#)

Checks that the temporary file being read have the expected binary contents.

Compilation flags:

static

Template:

`check_binary_input(Bytes)`

Mode and number of proofs:

`check_binary_input(+list(byte)) - zero_or_one`

See also:

[binary_input_assertion/2](#)

[set_binary_input/1](#)

[clean_binary_input/0](#)

[binary_input_assertion/3](#)

Returns an assertion for checking that the temporary file (referenced by the given alias) being read have the expected binary contents.

Compilation flags:

static

Template:

`binary_input_assertion(Alias,Bytes,Assertion)`

Mode and number of proofs:

`binary_input_assertion(+atom,+list(byte),--callable) - one`

See also:

[check_binary_input/2](#)

[set_binary_input/3](#)

[set_binary_input/2](#)

[clean_binary_input/0](#)

`binary_input_assertion/2`

Returns an assertion for checking that the temporary file being read have the expected binary contents.

Compilation flags:

`static`

Template:

`binary_input_assertion(Bytes,Assertion)`

Mode and number of proofs:

`binary_input_assertion(+list(byte),--callable) - one`

See also:

`check_binary_input/1`

`set_binary_input/1`

`clean_binary_input/0`

`clean_binary_input/0`

Cleans the temporary file used when testing binary input.

Compilation flags:

`static`

Mode and number of proofs:

`clean_binary_input - one`

See also:

`set_binary_input/3`

`set_binary_input/2`

`set_binary_input/1`

`set_text_output/3`

Creates a temporary file, in the same directory as the tests object, with the given text contents, and opens it for writing referenced by the given alias and using the additional options.

Compilation flags:

`static`

Template:

`set_text_output(Alias,Contents,Options)`

Mode and number of proofs:

`set_text_output(+atom,+atom,+list(stream_option)) - one`

`set_text_output(+atom,+list(atom),+list(stream_option)) - one`

See also:

`text_output_assertion/4`

`check_text_output/3`

`clean_text_output/0`

`set_text_output/2`

Creates a temporary file, in the same directory as the tests object, with the given text contents, and referenced by the given alias.

Compilation flags:

`static`

Template:

`set_text_output(Alias,Contents)`

Mode and number of proofs:

`set_text_output(+atom,+atom) - one`

`set_text_output(+atom,+list(atom)) - one`

See also:

`text_output_assertion/3`

`check_text_output/2`

`clean_text_output/0`

`set_text_output/1`

Creates a temporary file, in the same directory as the tests object, with the given text contents, and sets the current output stream to the file.

Compilation flags:

`static`

Template:

`set_text_output(Contents)`

Mode and number of proofs:

`set_text_output(+atom) - one`

`set_text_output(+list(atom)) - one`

See also:

`text_output_assertion/2`

`check_text_output/1`

`clean_text_output/0`

`check_text_output/3`

Checks that the temporary file (open with the given options and alias in the same directory as the tests object) being written have the expected text contents.

Compilation flags:

`static`

Template:

`check_text_output(Alias,Contents,Options)`

Mode and number of proofs:

`check_text_output(+atom,+atom,+list(stream_option)) - zero_or_one`

See also:

`set_text_output/3`

`text_output_assertion/4`

`clean_text_output/0`

`check_text_output/2`

Checks that the temporary file (open with default options and alias in the same directory as the tests object) being written have the expected text contents.

Compilation flags:

`static`

Template:

`check_text_output(Alias,Contents)`

Mode and number of proofs:

`check_text_output(+atom,+atom) - zero_or_one`

See also:

`set_text_output/2`

`text_output_assertion/3`

`clean_text_output/0`

`check_text_output/1`

Checks that the temporary file being written have the expected text contents.

Compilation flags:

`static`

Template:

`check_text_output(Contents)`

Mode and number of proofs:

`check_text_output(+atom) - zero_or_one`

See also:

`set_text_output/1`

`text_output_assertion/2`

`clean_text_output/0`

`text_output_assertion/4`

Returns an assertion for checking that the temporary file (open with the given options and alias in the same directory as the tests object) being written have the expected text contents.

Compilation flags:

`static`

Template:

`text_output_assertion(Alias,Contents,Options,Assertion)`

Mode and number of proofs:

`text_output_assertion(+atom,+atom,+list(stream_option),--callable) - one`

See also:

`set_text_output/3`

`check_text_output/3`

`clean_text_output/0`

`text_output_assertion/3`

Returns an assertion for checking that the temporary file (open with default options and alias in the same directory as the tests object) being written have the expected text contents.

Compilation flags:

`static`

Template:

`text_output_assertion(Alias,Contents,Assertion)`

Mode and number of proofs:

`text_output_assertion(+atom,+atom,--callable) - one`

See also:

`set_text_output/2`

`check_text_output/2`

`clean_text_output/0`

`text_output_assertion/2`

Returns an assertion for checking that the temporary file (open with default options in the same directory as the tests object) being written have the expected text contents.

Compilation flags:

`static`

Template:

`text_output_assertion(Contents,Assertion)`

Mode and number of proofs:

`text_output_assertion(+atom,--callable) - one`

See also:

`set_text_output/1`

`check_text_output/1`

`clean_text_output/0`

`text_output_contents/3`

Returns the contents of the temporary file (open with the given options and alias in the same directory as the tests object) being written.

Compilation flags:

`static`

Template:

`text_output_contents(Alias,Contents,Options)`

Mode and number of proofs:

`text_output_contents(+atom,-list(character),+list(stream_option)) - one`

`text_output_contents/2`

Returns the contents of the temporary file (open with default options and alias in the same directory as the tests object) being written.

Compilation flags:

`static`

Template:

`text_output_contents(Alias,Contents)`

Mode and number of proofs:

`text_output_contents(+atom,-list(character)) - one`

`text_output_contents/1`

Returns the contents of the temporary file (open with default options in the same directory as the tests object) being written.

Compilation flags:

`static`

Template:

`text_output_contents(Contents)`

Mode and number of proofs:

`text_output_contents(-list(character)) - one`

`clean_text_output/0`

Cleans the temporary file used when testing text output.

Compilation flags:

`static`

Mode and number of proofs:

`clean_text_output - one`

See also:

set_text_output/3
set_text_output/2
set_text_output/1

set_binary_output/3

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and opens it for writing referenced by the given alias and using the additional options.

Compilation flags:

static

Template:

set_binary_output(Alias,Contents,Options)

Mode and number of proofs:

set_binary_output(+atom,+list(byte),+list(stream_option)) - one

See also:

binary_output_assertion/3
check_binary_output/2
clean_binary_output/0

set_binary_output/2

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and opens it for writing referenced with the given alias.

Compilation flags:

static

Template:

set_binary_output(Alias,Bytes)

Mode and number of proofs:

set_binary_output(+atom,+list(byte)) - one

See also:

binary_output_assertion/3

`check_binary_output/2`
`clean_binary_output/0`

`set_binary_output/1`

Creates a temporary file, in the same directory as the tests object, with the given binary contents, and sets the current output stream to the file.

Compilation flags:

`static`

Template:

`set_binary_output(Bytes)`

Mode and number of proofs:

`set_binary_output(+list(byte)) - one`

See also:

`binary_output_assertion/2`

`check_binary_output/1`

`clean_binary_output/0`

`check_binary_output/2`

Checks that the temporary file (referenced by the given alias) have the expected binary contents.

Compilation flags:

`static`

Template:

`check_binary_output(Alias,Bytes)`

Mode and number of proofs:

`check_binary_output(+atom,+list(byte)) - zero_or_one`

See also:

`set_binary_output/3`

`set_binary_output/2`

`binary_output_assertion/3`

`clean_binary_output/0`

`check_binary_output/1`

Checks that the temporary file (open in the same directory as the tests object) have the expected binary contents.

Compilation flags:

`static`

Template:

`check_binary_output(Bytes)`

Mode and number of proofs:

`check_binary_output(+list(byte)) - zero_or_one`

See also:

`set_binary_output/1`

`binary_output_assertion/2`

`clean_binary_output/0`

`binary_output_assertion/3`

Returns an assertion for checking that the temporary file (referenced by the given alias) have the expected binary contents.

Compilation flags:

`static`

Template:

`binary_output_assertion(Alias,Bytes,Assertion)`

Mode and number of proofs:

`binary_output_assertion(+atom,+list(byte),--callable) - one`

See also:

`set_binary_output/2`

`check_binary_output/2`

`clean_binary_output/0`

`binary_output_assertion/2`

Returns an assertion for checking that the temporary file (open in the same directory as the tests object) have the expected binary contents.

Compilation flags:

`static`

Template:

`binary_output_assertion(Bytes,Assertion)`

Mode and number of proofs:

`binary_output_assertion(+list(byte),--callable) - one`

See also:

`set_binary_output/1`

`check_binary_output/1`

`clean_binary_output/0`

`binary_output_contents/2`

Returns the binary contents of the temporary file (referenced by the given alias) being written.

Compilation flags:

`static`

Template:

`binary_output_contents(Alias,Bytes)`

Mode and number of proofs:

`binary_output_contents(+atom,-list(byte)) - one`

binary_output_contents/1

Returns the binary contents of the temporary file being written.

Compilation flags:

static

Template:

binary_output_contents(Bytes)

Mode and number of proofs:

binary_output_contents(-list(byte)) - one

clean_binary_output/0

Cleans the temporary file used when testing binary output.

Compilation flags:

static

Mode and number of proofs:

clean_binary_output - one

See also:

set_binary_output/3

set_binary_output/2

set_binary_output/1

create_text_file/3

Creates a text file with the given contents. The file is open for writing using the given options. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

```
create_text_file(File,Contents,Options)
```

Mode and number of proofs:

```
create_text_file(+atom,+atom,+list(stream_option)) - one
```

```
create_text_file(+atom,+list(atom),+list(stream_option)) - one
```

create_text_file/2

Creates a text file with the given contents. The file is open for writing using default options. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

```
static
```

Template:

```
create_text_file(File,Contents)
```

Mode and number of proofs:

```
create_text_file(+atom,+atom) - one
```

```
create_text_file(+atom,+list(atom)) - one
```

create_binary_file/2

Creates a binary file with the given contents. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

```
static
```

Template:

```
create_binary_file(File,Bytes)
```

Mode and number of proofs:

```
create_binary_file(+atom,+list(byte)) - one
```

[check_text_file/3](#)

Checks that the contents of a text file match the expected contents. The file is open for reading using the given options. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`check_text_file(File,Contents,Options)`

Mode and number of proofs:

`check_text_file(+atom,+atom,+list(stream_option)) - zero_or_one`

See also:

[text_file_assertion/4](#)

[check_text_file/2](#)

Checks that the contents of a text file (open for reading using default options) match the expected contents. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`check_text_file(File,Contents)`

Mode and number of proofs:

`check_text_file(+atom,+atom) - zero_or_one`

See also:

[text_file_assertion/3](#)

[text_file_assertion/4](#)

Returns an assertion for checking that the given file have the expected text contents. The file is open for reading using the given options. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`text_file_assertion(File,Contents,Options,Assertion)`

Mode and number of proofs:

`text_file_assertion(+atom,+atom,+list(stream_option),--callable) - one`

See also:

[check_text_file/3](#)

[text_file_assertion/3](#)

Returns an assertion for checking that the given file have the expected text contents. The file is open for reading using default options. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`text_file_assertion(File,Contents,Assertion)`

Mode and number of proofs:

`text_file_assertion(+atom,+atom,--callable) - one`

See also:

[check_text_file/2](#)

[check_binary_file/2](#)

Checks the contents of a binary file match the expected contents. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`check_binary_file(File,Bytes)`

Mode and number of proofs:

`check_binary_file(+atom,+list(byte)) - zero_or_one`

See also:

[binary_file_assertion/3](#)

[binary_file_assertion/3](#)

Returns an assertion for checking that the given file have the expected binary contents. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`binary_file_assertion(File,Bytes,Assertion)`

Mode and number of proofs:

`binary_file_assertion(+atom,+list(byte),--callable) - one`

See also:

[check_binary_file/2](#)

[clean_file/1](#)

Closes any existing stream associated with the file and deletes the file if it exists. Relative file paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`clean_file(File)`

Mode and number of proofs:

`clean_file(+atom) - one`

See also:

[clean_directory/1](#)

[file_path/2](#)

[clean_directory/1](#)

Deletes an empty directory if it exists. Relative directory paths are interpreted as relative to the tests object path.

Compilation flags:

static

Template:

`clean_directory(Directory)`

Mode and number of proofs:

`clean_directory(+atom) - one`

See also:

[clean_file/1](#)

[file_path/2](#)

closed_input_stream/2

Opens a temporary file in the same directory as the tests object with the given options for reading, closes it, and returns its stream handle.

Compilation flags:

static

Template:

closed_input_stream(Stream,Options)

Mode and number of proofs:

closed_input_stream(-stream,+list(stream_option)) - one

closed_output_stream/2

Opens a temporary file in the same directory as the tests object with the given options for writing, closes it, and returns its stream handle.

Compilation flags:

static

Template:

closed_output_stream(Stream,Options)

Mode and number of proofs:

closed_output_stream(-stream,+list(stream_option)) - zero_or_one

stream_position/1

Returns a syntactically valid stream position by opening a temporary file in the same directory as the tests object.

Compilation flags:

static

Template:

stream_position(Position)

Mode and number of proofs:

`stream_position(-stream_position) - one`

test/2

Table of defined tests.

Compilation flags:

`static`

Template:

`test(Identifier,Test)`

Mode and number of proofs:

`test(?callable,?compound) - zero_or_more`

Private predicates

`running_test_sets_/0`

Internal flag used when running two or more test sets as a unified set.

Compilation flags:

`dynamic`

Mode and number of proofs:

`running_test_sets_ - zero_or_one`

test/3

Compiled unit tests. The list of variables is used to ensure variable sharing between a test with its test options.

Compilation flags:

`static`

Template:

test(Identifier,Variables,Outcome)

Mode and number of proofs:

test(?callable,?list(variable),?nonvar) - zero_or_more

auxiliary_predicate_counter_/1

Counter for generating unique auxiliary predicate names.

Compilation flags:

dynamic

Template:

auxiliary_predicate_counter_(Counter)

Mode and number of proofs:

auxiliary_predicate_counter_(?integer) - one_or_more

test_/2

Table of compiled tests.

Compilation flags:

dynamic

Template:

test_(Identifier,Test)

Mode and number of proofs:

test_(?callable,?compound) - zero_or_more

selected_test_/1

Table of selected tests for execution.

Compilation flags:

dynamic

Template:

selected_test_(Identifier)

Mode and number of proofs:

selected_test_(?callable) - zero_or_more

skipped_/1

Counter for skipped tests.

Compilation flags:

dynamic

Template:

skipped_(Counter)

Mode and number of proofs:

skipped_(?integer) - zero_or_one

passed_/3

Counter and total time for passed tests.

Compilation flags:

dynamic

Template:

passed_(Counter,CPUTime,WallTime)

Mode and number of proofs:

passed_(?integer,-float,-float) - zero_or_one

failed_/3

Counter and total time for failed tests.

Compilation flags:

dynamic

Template:

failed_(Counter,CPUTime,WallTime)

Mode and number of proofs:

failed_(?integer,-float,-float) - zero_or_one

flaky_/1

Counter for failed tests that are marked as flaky.

Compilation flags:

dynamic

Template:

flaky_(Counter)

Mode and number of proofs:

flaky_(?integer) - zero_or_one

fired_/3

Fired clauses when running the unit tests.

Compilation flags:

dynamic

Template:

fired_(Entity,Predicate,Clause)

Mode and number of proofs:

fired_(?entity_identifier,?predicate_indicator,?integer) - zero_or_more

covered_/4

Auxiliary predicate for collecting statistics on clause coverage.

Compilation flags:

dynamic

Template:

covered_(Entity,Predicate,Covered,Total)

Mode and number of proofs:

covered_(?entity__identifier,?callable,?integer,?integer) - zero_or_more

Operators

op(700,xfx,==~)

Scope:

public

category

1.43.4 lgtunit_messages

Logtalk unit test framework default message translations.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 10:0:0

Date: 2024-12-09

Compilation flags:

static

Provides:

logtalk::message_prefix_stream/4

logtalk::message_tokens//2

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.43.5 minimal_output

Intercepts unit test execution messages and outputs a minimal report.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 3:0:0

Date: 2021-05-27

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(minimal_output))`.
- Limitations: Cannot be used when the test objects also intercept lgtunit messages.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.43.6 tap_output

Intercepts unit test execution messages and outputs a report using the TAP format to the current output stream.

Availability:

```
logtalk_load(lgtunit(loader))
```

Author: Paulo Moura

Version: 4:0:1

Date: 2024-04-01

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::message_hook/4
```

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(tap_output))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - generating_/0
 - partial_/1
 - test_count_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

generating_/0

Flag to detect report in progress when processing two or more test sets as a unified set.

Compilation flags:

dynamic

Mode and number of proofs:

generating_ - zero_or_one

partial_/1

Cache of total of tests per test set.

Compilation flags:

dynamic

Template:

partial_(Count)

Mode and number of proofs:

partial_(?integer) - zero_or_more

test_count_/1

Test counter.

Compilation flags:

dynamic

Template:

test_count_(Count)

Mode and number of proofs:

test_count_(?integer) - zero_or_one

Operators

(none)

object

1.43.7 tap_report

Intercepts unit test execution messages and generates a tap_report.txt file using the TAP output format in the same directory as the tests object file.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 5:0:1

Date: 2024-04-01

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Uses:

logtalk

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(tap_report))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - `partial_/1`
 - `test_count_/1`
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

`partial_/1`

Cache of total of tests per test set.

Compilation flags:

`dynamic`

Template:

`partial_(Count)`

Mode and number of proofs:

`partial_(?integer) - zero_or_more`

test_count_/1

Test counter.

Compilation flags:

dynamic

Template:

test_count_(Count)

Mode and number of proofs:

test_count_(?integer) - zero_or_one

Operators

(none)

object

1.43.8 xunit_net_v2_output

Intercepts unit test execution messages and outputs a report using the xUnit.net v2 XML format to the current output stream.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 4:0:1

Date: 2024-04-01

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Uses:

user

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(xunit_net_v2_output))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - `message_cache_/1`
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

`message_cache_/1`

Table of messages emitted by the `lgtunit` tool when running tests.

Compilation flags:

`dynamic`

Template:

`message_cache_(Message)`

Mode and number of proofs:

`message_cache_(?callable) - zero_or_more`

Operators

(none)

object

1.43.9 xunit_net_v2_report

Intercepts unit test execution messages and generates a xunit_report.xml file using the xUnit.net v2 XML format in the same directory as the tests object file.

Availability:

`logtalk_load(lgtunit(loader))`

Author: Paulo Moura

Version: 5:0:1

Date: 2024-04-01

Compilation flags:

`static, context_switching_calls`

Provides:

`logtalk::message_hook/4`

Uses:

`logtalk`

`user`

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(xunit_net_v2_report))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - `message_cache_/1`
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

message_cache_/1

Table of messages emitted by the lgtunit tool when running tests.

Compilation flags:

dynamic

Template:

message_cache_(Message)

Mode and number of proofs:

message_cache_(?callable) - zero_or_more

Operators

(none)

object

1.43.10 xunit_output

Intercepts unit test execution messages and outputs a report using the xUnit XML format to the current output stream.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 4:0:1

Date: 2024-04-01

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Uses:

logtalk

user

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(xunit_output))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - message_cache_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

message_cache_/1

Table of messages emitted by the lgtunit tool when running tests.

Compilation flags:

dynamic

Template:

message_cache_(Message)

Mode and number of proofs:

message_cache_(?callable) - zero_or_more

Operators

(none)

object

1.43.11 xunit_report

Intercepts unit test execution messages and generates a xunit_report.xml file using the xUnit XML format in the same directory as the tests object file.

Availability:

logtalk_load(lgtunit(loader))

Author: Paulo Moura

Version: 5:0:1

Date: 2024-04-01

Compilation flags:

static, context_switching_calls

Provides:

logtalk::message_hook/4

Uses:

logtalk

user

Remarks:

- Usage: Simply load this object before running your tests using the goal `logtalk_load(lgtunit(xunit_report))`.

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
 - message_cache_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

message_cache_/1

Table of messages emitted by the lgtunit tool when running tests.

Compilation flags:

dynamic

Template:

message_cache_(Message)

Mode and number of proofs:

message_cache_(?callable) - zero_or_more

Operators

(none)

1.44 library

protocol

1.44.1 cloning

Object cloning protocol.

Availability:

```
logtalk_load(library(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2010-09-14

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - clone/1
- Protected predicates
- Private predicates
- Operators

Public predicates

clone/1

Clones an object, returning the identifier of the new object if none is given.

Compilation flags:

static

Template:

clone(Clone)

Mode and number of proofs:

clone(?object) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

category

1.44.2 counters

Named integer counters. Counter names can be any nonvar term.

Availability:

logtalk_load(library(loader))

Author: Paulo Moura

Version: 1:0:1

Date: 2022-02-11

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - counter/2
 - increment_counter/1
 - decrement_counter/1
 - reset_counter/1
 - reset_counters/0
- Protected predicates
- Private predicates
 - counter_/2
- Operators

Public predicates

counter/2

True if Counter is a counter with value Value.

Compilation flags:

static

Template:

counter(Counter,Value)

Mode and number of proofs:

counter(?nonvar,?integer) - zero_or_more

increment_counter/1

Increments the named counter.

Compilation flags:

static

Template:

increment_counter(Counter)

Mode and number of proofs:

increment_counter(+nonvar) - one

decrement_counter/1

Decrements the named counter.

Compilation flags:

static

Template:

decrement_counter(Counter)

Mode and number of proofs:

decrement_counter(+nonvar) - one

reset_counter/1

Resets the named counter to zero. Creates the counter if it does not exist.

Compilation flags:

static

Template:

reset_counter(Counter)

Mode and number of proofs:

reset_counter(+nonvar) - one

reset_counters/0

Resets all existing named counters to zero.

Compilation flags:

static

Mode and number of proofs:

reset_counters - one

Protected predicates

(none)

Private predicates

counter_/2

Table of named counters.

Compilation flags:

dynamic

Template:

counter_(Counter,Value)

Mode and number of proofs:

counter_(?nonvar,?integer) - zero_or_more

Operators

(none)

object

1.44.3 streamvars

Stream variables (supporting logical, backtracable, adding and retrieving of terms).

Availability:

```
logtalk_load(library(loader))
```

Author: Nobukuni Kino and Paulo Moura

Version: 1:3:0

Date: 2019-06-15

Compilation flags:

```
static, context_switching_calls
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - new/1
 - new/2
 - (<=)/2
 - (=>)/2
- Protected predicates
- Private predicates
- Operators
 - op(100,xfx,<=)
 - op(100,xfx,=>)

Public predicates

new/1

Makes Variable a stream variable. Initial state will be empty.

Compilation flags:

static

Template:

new(Variable)

Mode and number of proofs:

new(--streamvar) - one

Exceptions:

Variable is not a variable:

type_error(variable,Variable)

new/2

Makes Variable a stream variable and sets its initial state to Value.

Compilation flags:

static

Template:

new(Variable,Value)

Mode and number of proofs:

new(--streamvar,@nonvar) - one

Exceptions:

Variable is not a variable:

type_error(variable,Variable)

$(\leq)/2$

Sets the state of the stream variable Variable to Value (initializing the variable if needed).

Compilation flags:

static

Template:

Variable \leq Value

Mode and number of proofs:

(?streamvar) \leq (@nonvar) - one

$(\Rightarrow)/2$

Unifies Value with the current state of the stream variable Variable.

Compilation flags:

static

Template:

Variable \Rightarrow Value

Mode and number of proofs:

+streamvar \Rightarrow ?nonvar - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

op(100,xfx,<=)

Scope:

public

op(100,xfx,=>)

Scope:

public

1.45 listing

category

1.45.1 listing

Listing predicates.

Availability:

logtalk_load(listing(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2024-01-26

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - listing/0
 - listing/1
 - portray_clause/1
- Protected predicates
- Private predicates
- Operators

Public predicates

listing/0

Lists all clauses of all visible dynamic predicates to the current output stream.

Compilation flags:

static

Mode and number of proofs:

listing - one

listing/1

Lists all clauses of a visible dynamic predicate or non-terminal to the current output stream. When the argument is a clause head, lists all matching clauses.

Compilation flags:

static

Template:

listing(Spec)

Mode and number of proofs:

listing(+predicate_indicator) - one_or_error

listing(+non_terminal_indicator) - one_or_error

listing(+callable) - one_or_error

Exceptions:

Spec is not ground:

instantiation_error

Spec is ground but not a valid predicate indicator:

```
type_error(predicate_indicator,Spec)
```

Spec is ground but not a valid non-terminal indicator:

```
type_error(non_terminal_indicator,Spec)
```

Spec is a predicate indicator but not a visible predicate:

```
existence_error(predicate,Spec)
```

Spec is a non-terminal indicator but not a visible non-terminal:

```
existence_error(non_terminal,Spec)
```

Spec is a callable term with a Functor/Arity indicator but not a visible predicate:

```
existence_error(predicate,Functor/Arity)
```

Spec is a predicate indicator of a visible predicate but not a dynamic predicate:

```
permission_error(access,predicate,Spec)
```

Spec is a non-terminal indicator of a visible non-terminal but not a dynamic non-terminal:

```
permission_error(access,non_terminal,Spec)
```

Spec is a callable term for a visible predicate with a Functor/Arity indicator but not a dynamic predicate:

```
permission_error(access,predicate,Functor/Arity)
```

portray_clause/1

Pretty prints a clause to the current output stream.

Compilation flags:

```
static
```

Template:

```
portray_clause(Clause)
```

Mode and number of proofs:

```
portray_clause(+clause) - one
```

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.46 logging

object

1.46.1 logger

Global logger object for logging events to files.

Availability:

`logtalk_load(logging(loader))`

Author: Paulo Moura

Version: 1:0:0

Date: 2011-01-06

Compilation flags:

`static, context_switching_calls`

Implements:

`public loggingp`

Remarks:

(none)

Inherited public predicates:

`define_log_file/2 disable_logging/1 enable_logging/1 init_log_file/2 log_event/2 log_file/2 logging/1`

- Public predicates
- Protected predicates
- Private predicates

- log_file_/2
- logging_to_file_/2
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

log_file_/2

Table of log files.

Compilation flags:

dynamic

Template:

log_file_(Alias,File)

Mode and number of proofs:

log_file_(?atom,?nonvar) - zero_or_more

logging_to_file_/2

Table of logging file status for log files.

Compilation flags:

dynamic

Template:

logging_to_file_(Alias,Status)

Mode and number of proofs:

logging_to_file_(?atom,?atom) - zero_or_more

Operators

(none)

category

1.46.2 logging

Logging events to files category.

Availability:

logtalk_load(logging(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2011-01-06

Compilation flags:

static

Implements:

public loggingp

Remarks:

(none)

Inherited public predicates:

define_log_file/2 disable_logging/1 enable_logging/1 init_log_file/2 log_event/2 log_file/2
logging/1

- Public predicates
- Protected predicates
- Private predicates
 - log_file_/2
 - logging_to_file_/2
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

log_file_/2

Table of log files.

Compilation flags:

dynamic

Template:

log_file_(Alias,File)

Mode and number of proofs:

log_file_(?atom,?nonvar) - zero_or_more

logging_to_file_/2

Table of logging file status for log files.

Compilation flags:

dynamic

Template:

logging_to_file_(Alias,Status)

Mode and number of proofs:

logging_to_file_(?atom,?atom) - zero_or_more

Operators

(none)

protocol

1.46.3 loggingp

Logging events to files protocol.

Availability:

logtalk_load(logging(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2011-01-06

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - log_file/2
 - define_log_file/2
 - init_log_file/2
 - log_event/2
 - logging/1
 - enable_logging/1
 - disable_logging/1
- Protected predicates
- Private predicates

- Operators

Public predicates

`log_file/2`

Access to the table of log files.

Compilation flags:

`static`

Template:

`log_file(Alias,File)`

Mode and number of proofs:

`log_file(?atom,?atom) - zero_or_more`

`define_log_file/2`

Defines a log file with alias `Alias` and file name `File`. If the log file already exists, its contents are kept. Logging is enabled by default.

Compilation flags:

`static`

Template:

`define_log_file(Alias,File)`

Mode and number of proofs:

`define_log_file(+atom,+atom) - one`

`init_log_file/2`

Initializes a new log file with alias `Alias` and file name `File`. If the log file already exists, its contents are erased. Logging is enabled by default.

Compilation flags:

`static`

Template:

`init_log_file(Alias,File)`

Mode and number of proofs:

`init_log_file(+atom,+atom) - one`

`log_event/2`

Logs an event Event to a log file with alias Alias. Fails if a log file with alias Alias is not defined.

Compilation flags:

`static`

Template:

`log_event(Alias,Event)`

Mode and number of proofs:

`log_event(+atom,+nonvar) - zero_or_one`

`logging/1`

True if logging to file with alias Alias is enabled.

Compilation flags:

`static`

Template:

`logging(Alias)`

Mode and number of proofs:

`logging(+atom) - zero_or_one`

`enable_logging/1`

Enables logging to file with alias `Alias`. Fails if a log file with alias `Alias` is not defined.

Compilation flags:

`static`

Template:

`enable_logging(Alias)`

Mode and number of proofs:

`enable_logging(+atom) - zero_or_one`

`disable_logging/1`

Disables logging to file with alias `Alias`. Fails if a log file with alias `Alias` is not defined.

Compilation flags:

`static`

Template:

`disable_logging(Alias)`

Mode and number of proofs:

`disable_logging(+atom) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

logging

1.47 loops

object

1.47.1 loop

Loop control structures predicates.

Availability:

`logtalk_load(loops(loader))`

Author: Paulo Moura

Version: 1:4:1

Date: 2020-12-20

Compilation flags:

`static, context_switching_calls`

Implements:

`public loopp`

Remarks:

(none)

Inherited public predicates:

`dowhile/2 fordownto/3 fordownto/4 fordownto/5 foreach/3 foreach/4 forto/3 forto/4 forto/5 whiledo/2`

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.47.2 loopp

Loop control constructs protocol.

Availability:

logtalk_load(loops(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2017-03-20

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - whiledo/2
 - dowhile/2
 - foreach/3
 - foreach/4
 - forto/3
 - forto/4
 - forto/5
 - fordownto/3
 - fordownto/4
 - fordownto/5
- Protected predicates
- Private predicates
- Operators

Public predicates

whiledo/2

While Condition is true do Action.

Compilation flags:

static

Template:

whiledo(Condition,Action)

Meta-predicate template:

whiledo(0,0)

Mode and number of proofs:

whiledo(+callable,@callable) - zero_or_one

dowhile/2

Do Action while Condition is true.

Compilation flags:

static

Template:

dowhile(Action,Condition)

Meta-predicate template:

dowhile(0,0)

Mode and number of proofs:

dowhile(@callable,+callable) - zero_or_one

foreach/3

For each Element in List call Goal.

Compilation flags:

static

Template:

foreach(Element,List,Goal)

Meta-predicate template:

foreach(*,*,0)

Mode and number of proofs:

foreach(@var,+list(term),@callable) - zero_or_one

foreach/4

For each Element in List at position Index call Goal. Index starts at 1.

Compilation flags:

static

Template:

foreach(Element,Index,List,Goal)

Meta-predicate template:

```
foreach(*,*,*,0)
```

Mode and number of proofs:

```
foreach(@var,@var,+list(term),@callable) - zero_or_one
```

forto/3

Calls Goal counting up from First to Last. Increment is 1. For convenience, First and Last can be arithmetic expressions. Fails iff Goal fails.

Compilation flags:

```
static
```

Template:

```
forto(First,Last,Goal)
```

Meta-predicate template:

```
forto(*,*,0)
```

Mode and number of proofs:

```
forto(+number,+number,@callable) - zero_or_one
```

forto/4

Calls Goal counting up from First to Last and binding Count to each successive value. Increment is 1. For convenience, First and Last can be arithmetic expressions. Fails iff Goal fails.

Compilation flags:

```
static
```

Template:

```
forto(Count,First,Last,Goal)
```

Meta-predicate template:

```
forto(*,*,*,0)
```

Mode and number of proofs:

```
forto(@var,+number,+number,@callable) - zero_or_one
```

`forto/5`

Calls Goal counting up from First to Last and binding Count to each successive value. For convenience, First, Last, and Increment can be arithmetic expressions (uses Increment absolute value). Fails iff Goal fails.

Compilation flags:

`static`

Template:

`forto(Count,First,Last,Increment,Goal)`

Meta-predicate template:

`forto(*,*,*,*,0)`

Mode and number of proofs:

`forto(@var,+number,+number,+number,@callable) - zero_or_one`

`fordownto/3`

Calls Goal counting down from First to Last. Decrement is 1. For convenience, First and Last can be arithmetic expressions. Fails iff Goal fails.

Compilation flags:

`static`

Template:

`fordownto(First,Last,Goal)`

Meta-predicate template:

`fordownto(*,*,0)`

Mode and number of proofs:

`fordownto(+number,+number,@callable) - zero_or_one`

`fordownto/4`

Calls Goal counting down from First to Last and binding Count to each successive value. Decrement is 1. For convenience, First and Last can be arithmetic expressions. Fails iff Goal fails.

Compilation flags:

`static`

Template:

```
fordownto(Count,First,Last,Goal)
```

Meta-predicate template:

```
fordownto(*,*,*,0)
```

Mode and number of proofs:

```
fordownto(@var,+number,+number,@callable) - zero_or_one
```

`fordownto/5`

Calls Goal counting down from First to Last and binding Count to each successive value. For convenience, First, Last, and Decrement can be arithmetic expressions (uses Decrement absolute value). Fails iff Goal fails.

Compilation flags:

```
static
```

Template:

```
fordownto(Count,First,Last,Decrement,Goal)
```

Meta-predicate template:

```
fordownto(*,*,*,*,0)
```

Mode and number of proofs:

```
fordownto(@var,+number,+number,+number,@callable) - zero_or_one
```

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[loop](#)

1.48 meta

object

1.48.1 meta

Some useful meta-predicates.

Availability:

```
logtalk_load(meta(loader))
```

Author: Paulo Moura

Version: 5:2:0

Date: 2016-10-06

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public metap
```

Aliases:

```
metap map/2 as succeeds/2
metap map/2 as maplist/2
metap map/3 as maplist/3
metap map/4 as maplist/4
metap map/5 as maplist/5
metap map/6 as maplist/6
metap map/7 as maplist/7
metap map/8 as maplist/8
metap include/3 as filter/3
metap fold_left/4 as foldl/4
metap fold_left_1/3 as foldl1/3
metap fold_right/4 as foldr/4
metap fold_right_1/3 as foldr1/3
metap scan_left/4 as scanl/4
metap scan_left_1/3 as scanl1/3
metap scan_right/4 as scanr/4
metap scan_right_1/3 as scanr1/3
```

Remarks:

```
(none)
```

Inherited public predicates:

exclude/3 findall_member/4 findall_member/5 fold_left/4 fold_left_1/3 fold_right/4
fold_right_1/3 include/3 map/2 map/3 map/4 map/5 map/6 map/7 map/8 map_reduce/5
partition/4 partition/6 scan_left/4 scan_left_1/3 scan_right/4 scan_right_1/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`meta_compiler`

`protocol`

1.48.2 metap

Useful meta-predicates protocol.

Availability:

`logtalk_load(meta(loader))`

Author: Paulo Moura

Version: 6:1:0

Date: 2015-12-23

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - include/3
 - exclude/3
 - findall_member/4
 - findall_member/5
 - partition/4
 - partition/6
 - fold_left/4
 - fold_left_1/3
 - scan_left/4
 - scan_left_1/3
 - fold_right/4
 - fold_right_1/3
 - scan_right/4
 - scan_right_1/3
 - map/2
 - map/3
 - map/4
 - map/5
 - map/6
 - map/7
 - map/8
 - map_reduce/5
- Protected predicates
- Private predicates
- Operators

Public predicates

include/3

Returns a list of all list elements that satisfy a predicate.

Compilation flags:

static

Template:

include(Closure,List,Included)

Meta-predicate template:

include(1,*,*)

Mode and number of proofs:

include(+callable,+list,-list) - one

exclude/3

Returns a list of all list elements that fail to satisfy a predicate.

Compilation flags:

static

Template:

exclude(Closure,List,Excluded)

Meta-predicate template:

exclude(1,*,*)

Mode and number of proofs:

exclude(+callable,+list,-list) - one

findall_member/4

Finds all members of a list that satisfy a given test.

Compilation flags:

static

Template:

```
findall_member(Member,List,Test,Result)
```

Meta-predicate template:

```
findall_member(*,*,0,*)
```

Mode and number of proofs:

```
findall_member(@term,+list,@callable,-list) - one
```

`findall_member/5`

Finds all members of a list that satisfy a given test appending the given tail to the result.

Compilation flags:

```
static
```

Template:

```
findall_member(Member,List,Test,Result,Tail)
```

Meta-predicate template:

```
findall_member(*,*,0,*,*)
```

Mode and number of proofs:

```
findall_member(@term,+list,@callable,-list,+list) - one
```

`partition/4`

Partition a list of elements in two lists using a predicate.

Compilation flags:

```
static
```

Template:

```
partition(Closure,List,Included,Excluded)
```

Meta-predicate template:

```
partition(1,*,*,*)
```

Mode and number of proofs:

```
partition(+callable,+list,-list,-list) - one
```

partition/6

Partitions a list in lists with values less, equal, and greater than a given value using a comparison predicate with the same argument order as compare/3.

Compilation flags:

static

Template:

partition(Closure,List,Value,Less,Equal,Greater)

Meta-predicate template:

partition(3,*,*,*,*)

Mode and number of proofs:

partition(+callable,+list,@term,-list,-list,-list) - one

fold_left/4

List folding (left associative). Closure is extended with three arguments: accumulator, list element, and updated accumulator.

Compilation flags:

static

Template:

fold_left(Closure,Accumulator,List,Result)

Meta-predicate template:

fold_left(3,*,*,*)

Mode and number of proofs:

fold_left(+callable,?term,+list,?term) - zero_or_more

fold_left_1/3

List folding (left associative). Closure is extended with three arguments: accumulator, list element, and updated accumulator. The initial value of the accumulator is the list first element. Fails for empty lists.

Compilation flags:

static

Template:

```
fold_left_1(Closure,List,Result)
```

Meta-predicate template:

```
fold_left_1(3,*,*)
```

Mode and number of proofs:

```
fold_left_1(+callable,+list,?term) - zero_or_more
```

scan_left/4

List scanning (left associative). Closure is extended with three arguments: accumulator, list element, and updated accumulator.

Compilation flags:

```
static
```

Template:

```
scan_left(Closure,Accumulator,List,Results)
```

Meta-predicate template:

```
scan_left(3,*,*,*)
```

Mode and number of proofs:

```
scan_left(+callable,?term,+list,?list) - zero_or_more
```

scan_left_1/3

List scanning (left associative). Closure is extended with three arguments: accumulator, list element, and updated accumulator. The accumulator is initialized with the list first element. Fails for empty lists.

Compilation flags:

```
static
```

Template:

```
scan_left_1(Closure,List,Results)
```

Meta-predicate template:

```
scan_left_1(3,*,*)
```

Mode and number of proofs:

```
scan_left_1(+callable,+list,?list) - zero_or_more
```

fold_right/4

List folding (right associative). Closure is extended with three arguments: list element, accumulator, and updated accumulator.

Compilation flags:

static

Template:

fold_right(Closure,Accumulator,List,Result)

Meta-predicate template:

fold_right(3,*,*,*)

Mode and number of proofs:

fold_right(+callable,?term,+list,?term) - zero_or_more

fold_right_1/3

List folding (right associative). Closure is extended with three arguments: list element, accumulator, and updated accumulator. The initial value of the accumulator is the list first element. Fails for empty lists.

Compilation flags:

static

Template:

fold_right_1(Closure,List,Result)

Meta-predicate template:

fold_right_1(3,*,*)

Mode and number of proofs:

fold_right_1(+callable,+list,?term) - zero_or_more

scan_right/4

List scanning (right associative). Closure is extended with three arguments: list element, accumulator, and updated accumulator.

Compilation flags:

static

Template:

```
scan_right(Closure,Accumulator,List,Results)
```

Meta-predicate template:

```
scan_right(3,*,*,*)
```

Mode and number of proofs:

```
scan_right(+callable,?term,+list,?list) - zero_or_more
```

scan_right_1/3

List scanning (right associative). Closure is extended with three arguments: list element, accumulator, and updated accumulator. The accumulator is initialized with the list first element. Fails for empty lists.

Compilation flags:

```
static
```

Template:

```
scan_right_1(Closure,List,Results)
```

Meta-predicate template:

```
scan_right_1(3,*,*)
```

Mode and number of proofs:

```
scan_right_1(+callable,+list,?list) - zero_or_more
```

map/2

True if the predicate succeeds for each list element.

Compilation flags:

```
static
```

Template:

```
map(Closure,List)
```

Meta-predicate template:

```
map(1,*)
```

Mode and number of proofs:

```
map(+callable,?list) - zero_or_more
```

map/3

List mapping predicate taken arguments from two lists of elements.

Compilation flags:

static

Template:

map(Closure,List1,List2)

Meta-predicate template:

map(2,*,*)

Mode and number of proofs:

map(+callable,?list,?list) - zero_or_more

map/4

List mapping predicate taken arguments from three lists of elements.

Compilation flags:

static

Template:

map(Closure,List1,List2,List3)

Meta-predicate template:

map(3,*,*,*)

Mode and number of proofs:

map(+callable,?list,?list,?list) - zero_or_more

map/5

List mapping predicate taken arguments from four lists of elements.

Compilation flags:

static

Template:

map(Closure,List1,List2,List3,List4)

Meta-predicate template:

```
map(4,*,*,*,*)
```

Mode and number of proofs:

```
map(+callable,?list,?list,?list,?list) - zero_or_more
```

map/6

List mapping predicate taken arguments from five lists of elements.

Compilation flags:

```
static
```

Template:

```
map(Closure,List1,List2,List3,List4,List5)
```

Meta-predicate template:

```
map(5,*,*,*,*,*)
```

Mode and number of proofs:

```
map(+callable,?list,?list,?list,?list,?list) - zero_or_more
```

map/7

List mapping predicate taken arguments from six lists of elements.

Compilation flags:

```
static
```

Template:

```
map(Closure,List1,List2,List3,List4,List5,List6)
```

Meta-predicate template:

```
map(6,*,*,*,*,*,*)
```

Mode and number of proofs:

```
map(+callable,?list,?list,?list,?list,?list,?list) - zero_or_more
```

map/8

List mapping predicate taken arguments from seven lists of elements.

Compilation flags:

static

Template:

map(Closure,List1,List2,List3,List4,List5,List6,List7)

Meta-predicate template:

map(7,*,*,*,*,*,*,*)

Mode and number of proofs:

map(+callable,?list,?list,?list,?list,?list,?list,?list) - zero_or_more

map_reduce/5

Map a list and apply a fold left (reduce) to the resulting list.

Compilation flags:

static

Template:

map_reduce(Map,Reduce,Accumulator,List,Result)

Meta-predicate template:

map_reduce(2,3,*,*,*)

Mode and number of proofs:

map_reduce(+callable,+callable,+term,?list,?term) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[meta](#)

1.49 meta_compiler

object

1.49.1 meta_compiler

Compiler for the meta object meta-predicates. Generates auxiliary predicates in order to avoid meta-call overheads.

Availability:

```
logtalk_load(meta_compiler(loader))
```

Author: Paulo Moura

Version: 0:16:0

Date: 2024-10-24

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Uses:

```
gensym
```

```
list
```

```
logtalk
```

```
user
```

Remarks:

- Usage: Compile source files with calls to the meta object meta-predicates using the compiler option `hook(meta_compiler)`.

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
 - generated_predicate_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

generated_predicate_/1

Table of generated auxiliary predicates.

Compilation flags:

dynamic

Template:

generated_predicate_(Predicate)

Mode and number of proofs:

generated_predicate_(?predicate_indicator) - zero_or_more

Operators

(none)

See also:

meta

1.50 metagol

object

1.50.1 metagol

Inductive logic programming (ILP) system based on meta-interpretive learning.

Availability:

```
logtalk_load(metagol(loader))
```

Author: Metagol authors; adapted to Logtalk by Paulo Moura.

Version: 0:24:4

Date: 2024-03-15

Copyright: Copyright 2016 Metagol authors; Copyright 2018-2024 Paulo Moura

License: BSD-3-Clause

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Provides:

```
logtalk::message_tokens//2
```

```
logtalk::message_prefix_stream/4
```

Uses:

```
coroutining
```

```
integer
```

```
list
```

```
logtalk
```

```
meta
```

```
timeout
```

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
 - learn/3
 - learn/2
 - learn_seq/2
 - learn_with_timeout/4
 - program_to_clauses/2
 - pprint/1
 - metarule/6
 - head_pred/1
 - body_pred/1
 - ibk/3
 - func_test/3
 - functional/0
 - min_clauses/1
 - max_clauses/1
 - max_inv_preds/1
 - metarule_next_id/1
 - timeout/1
- Protected predicates
 - pprint_clause/1
 - pprint_clauses/1
 - compiled_pred_call/2
 - body_pred_call/2
 - type/3
- Private predicates
- Operators

Public predicates

learn/3

Learns from a set of positive examples and a set of negative examples and returns the learned program.

Compilation flags:

static

Template:

learn(PositiveExamples,NegativeExamples,Program)

Mode and number of proofs:

learn(@list(example),@list(example),-list(term)) - zero_or_more

learn/2

Learns from a set of positive examples and a set of negative examples and pretty prints the learned program.

Compilation flags:

static

Template:

learn(PositiveExamples,NegativeExamples)

Mode and number of proofs:

learn(@list(example),@list(example)) - zero_or_more

learn_seq/2

Learns from a sequence of examples represented as a list of PositiveExamples/NegativeExamples elements and returns the learned program.

Compilation flags:

static

Template:

learn_seq(Examples,Program)

Mode and number of proofs:

`learn_seq(@list(example),-list(clause)) - zero_or_one`

`learn_with_timeout/4`

Learns from a set of positive examples and a set of negative examples and returns the learned program constrained by the given timeout or its default value.

Compilation flags:

`static`

Template:

`learn_with_timeout(PositiveExamples,NegativeExamples,Program,Timeout)`

Mode and number of proofs:

`learn_with_timeout(@list(example),@list(example),-list(term),+number) - zero_or_one_or_error`

`learn_with_timeout(@list(example),@list(example),-list(term),-number) - zero_or_one_or_error`

Exceptions:

Learning does not complete in the allowed time:

`timeout(learn(PositiveExamples,NegativeExamples,Program))`

`program_to_clauses/2`

Converts a learned program into a list of clauses.

Compilation flags:

`static`

Template:

`program_to_clauses(Program,Clauses)`

Mode and number of proofs:

`program_to_clauses(@list(term),-list(clause)) - one`

pprint/1

Pretty prints a learned program.

Compilation flags:

static

Template:

pprint(Program)

Mode and number of proofs:

pprint(@list(term)) - one

metarule/6

Compilation flags:

static

head_pred/1

Compilation flags:

static

body_pred/1

Compilation flags:

dynamic

ibk/3

Compilation flags:
static

func_test/3

Compilation flags:
static

functional/0

Compilation flags:
dynamic

min_clauses/1

Compilation flags:
dynamic

max_clauses/1

Compilation flags:
dynamic

max_inv_preds/1

Compilation flags:
dynamic

metarule_next_id/1

Compilation flags:
dynamic

timeout/1

Compilation flags:
dynamic

Protected predicates

pprint_clause/1

Compilation flags:
static

pprint_clauses/1

Compilation flags:
static

compiled_pred_call/2

Compilation flags:
dynamic

body_pred_call/2

Compilation flags:
dynamic

type/3

Compilation flags:
dynamic

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)
protocol

1.50.2 metagol_example_protocol

Convenient learning predicates for use in examples and unit tests.

Availability:
logtalk_load(metagol(loader))

Author: Paulo Moura.
Version: 0:1:1
Date: 2024-03-15

License: BSD-3-Clause

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - learn/1
 - learn/0
- Protected predicates
- Private predicates
- Operators

Public predicates

learn/1

Learns and returns set of clauses.

Compilation flags:

static

Template:

learn(Clauses)

Mode and number of proofs:

learn(-list(clause)) - zero_or_more

learn/0

Learns and prints a set of clauses.

Compilation flags:

static

Mode and number of proofs:

learn - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.51 mutations

object

1.51.1 default_atom_mutations

Default atom mutations.

Availability:

logtalk_load(mutations(loader))

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-24

Compilation flags:

static, context_switching_calls

Provides:

`mutations_store::mutation/4`

Uses:

`fast_random`

`list`

`type`

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`type`

`object`

1.51.2 default_compound_mutations

Default compound mutations.

Availability:

```
logtalk_load(mutations(loader))
```

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-23

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
mutations_store::mutation/4
```

Uses:

```
mutations_store
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

type

object

1.51.3 default_float_mutations

Default float mutations.

Availability:

logtalk_load(mutations(loader))

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-23

Compilation flags:

static, context_switching_calls

Provides:

mutations_store::mutation/4

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

type

object

1.51.4 default_integer_mutations

Default integer mutations.

Availability:

```
logtalk_load(mutations(loader))
```

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-24

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
mutations_store::mutation/4
```

Uses:

```
fast_random
```

```
list
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

type

object

1.51.5 default_list_mutations

Default list mutations.

Availability:

logtalk_load(mutations(loader))

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-24

Compilation flags:

static, context_switching_calls

Provides:

mutations_store::mutation/4

Uses:

fast_random

list

mutations_store

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[type](#)

[category](#)

1.51.6 mutations

Adds mutations support to the library type object.

Availability:

```
logtalk_load(mutations(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-11-23

Compilation flags:

```
static
```

Complements:

```
type
```

Uses:

```
mutations_store
```

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
 - [mutation/3](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

mutation/3

Returns a random mutation of a term into another term of the same type. The input Term is assume to be valid for the given Type.

Compilation flags:

static

Template:

mutation(Type,Term,Mutation)

Mode and number of proofs:

mutation(@callable,@term,-term) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.51.7 mutations_store

Stores mutation definitions for selected types. User extensible by defining objects or categories defining clauses for the mutation/3 predicate and using this object as a hook object for their compilation.

Availability:

logtalk_load(mutations(loader))

Author: Paulo Moura

Version: 0:1:0

Date: 2023-11-23

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Uses:

fast_random

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
 - mutation/3
 - counter/2
- Protected predicates
- Private predicates
 - mutation/4
 - counter_/2
- Operators

Public predicates

mutation/3

Returns a random mutation of a term into another term of the same type. The input Term is assumed to be valid for the given Type.

Compilation flags:

static

Template:

mutation(Type,Term,Mutation)

Mode and number of proofs:

mutation(@callable,@term,-term) - one

counter/2

Table of the number of mutations available per type.

Compilation flags:

static

Template:

counter(Type,N)

Mode and number of proofs:

counter(?callable,?positive_integer) - zero_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

mutation/4

Returns a random mutation of a term into another term of the same type using mutator N. The input Term is assume to be valid for the given Type.

Compilation flags:

static, multifile

Template:

mutation(Type,N,Term,Mutation)

Mode and number of proofs:

mutation(?callable,?positive_integer,@term,-term) - zero_or_more

counter_/2

Internal counter for the number of mutations available for a given type.

Compilation flags:

dynamic

Template:

counter_(Type,N)

Mode and number of proofs:

counter_(?callable,?positive_integer) - zero_or_more

Operators

(none)

See also:

type

1.52 nested_dictionaries

object

1.52.1 navltree

Nested dictionary implementation based on the AVL tree implementation. Uses standard order to compare keys.

Availability:

logtalk_load(nested_dictionaries(loader))

Author: Paul Brown and Paulo Moura.

Version: 0:1:0

Date: 2021-04-09

Compilation flags:

static, context_switching_calls

Implements:

```
public nested_dictionary_protocol
```

Extends:

```
private avltree
```

Remarks:

(none)

Inherited public predicates:

```
as_curly_bracketed/2 as_nested_dictionary/2 delete_in/4 empty/1 insert_in/4 lookup_in/3  
new/1 update_in/4 update_in/5
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

nrmtree, nbintree

object

1.52.2 nbintree

Nested dictionary implementation based on the simple binary tree implementation. Uses standard order to compare keys.

Availability:

```
logtalk_load(nested_dictionaries(loader))
```

Author: Paul Brown and Paulo Moura.

Version: 0:1:0

Date: 2021-04-09

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public nested_dictionary_protocol
```

Extends:

```
private bintree
```

Remarks:

(none)

Inherited public predicates:

```
as_curly_bracketed/2 as_nested_dictionary/2 delete_in/4 empty/1 insert_in/4 lookup_in/3  
new/1 update_in/4 update_in/5
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[nrbtree](#), [navltree](#)

[protocol](#)

1.52.3 nested_dictionary_protocol

Nested dictionary protocol.

Availability:

`logtalk_load(nested_dictionaries(loader))`

Author: Paul Brown and Paulo Moura

Version: 0:1:0

Date: 2021-04-07

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - new/1
 - empty/1
 - as_nested_dictionary/2
 - as_curly_bracketed/2
 - lookup_in/3
 - update_in/4
 - update_in/5
 - insert_in/4
 - delete_in/4
- Protected predicates
- Private predicates
- Operators

Public predicates

new/1

Create an empty (nested) dictionary.

Compilation flags:

static

Template:

new(Dictionary)

Mode and number of proofs:

new(--dictionary) - one

empty/1

True iff the dictionary is empty.

Compilation flags:

static

Template:

empty(Dictionary)

Mode and number of proofs:

empty(@dictionary) - zero_or_one

as_nested_dictionary/2

Creates a (nested) dictionary term from a curly-bracketed term representation.

Compilation flags:

static

Template:

as_nested_dictionary(Term,Dictionary)

Mode and number of proofs:

as_nested_dictionary(++term,--dictionary) - one_or_error

as_curly_bracketed/2

Creates a a curly-bracketed term representation from a (nested) dictionary.

Compilation flags:

static

Template:

as_curly_bracketed(Dictionary,Term)

Mode and number of proofs:

as_curly_bracketed(+dictionary,--term) - one_or_error

lookup_in/3

Lookup a chain of keys in a nested dictionary. Unifies Value with Dictionary when Keys is the empty list.

Compilation flags:

static

Template:

lookup_in(Keys,Value,Dictionary)

Mode and number of proofs:

lookup_in(++list(ground),?term,+dictionary) - zero_or_more

update_in/4

Updates the value found by traversing through the nested keys.

Compilation flags:

static

Template:

update_in(OldDictionary,Keys,Value,NewDictionary)

Mode and number of proofs:

update_in(+dictionary,++list(ground),++term,--dictionary) - zero_or_one

update_in/5

Updates the value found by traversing through the nested keys, only succeeding if the value found after traversal matches the old value.

Compilation flags:

static

Template:

update_in(OldDictionary,Keys,OldValue,NewValue,NewDictionary)

Mode and number of proofs:

update_in(+dictionary,++list(ground),?term,++term,--dictionary) - zero_or_one

insert_in/4

Inserts a key-value pair into a dictionary by traversing through the nested keys. When the key already exists, the associated value is updated.

Compilation flags:

static

Template:

insert_in(OldDictionary,Keys,Value,NewDictionary)

Mode and number of proofs:

insert_in(+dictionary,++list(ground),++term,--dictionary) - zero_or_one

delete_in/4

Deletes a matching key-value pair from a dictionary by traversing through the nested keys, returning the updated dictionary.

Compilation flags:

static

Template:

delete_in(OldDictionary,Keys,Value,NewDictionary)

Mode and number of proofs:

delete_in(+dictionary,++list(ground),?term,--dictionary) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[navltree](#), [nbintree](#), [nrmtree](#)

object

1.52.4 nrmtree

Nested dictionary implementation based on the red-black tree implementation. Uses standard order to compare keys.

Availability:

```
logtalk_load(nested_dictionaries(loader))
```

Author: Paul Brown and Paulo Moura.

Version: 0:1:0

Date: 2021-04-09

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public nested_dictionary_protocol
```

Extends:

```
private rbtree
```

Remarks:

(none)

Inherited public predicates:

```
as_curly_bracketed/2 as_nested_dictionary/2 delete_in/4 empty/1 insert_in/4 lookup_in/3
new/1 update_in/4 update_in/5
```

- [Public predicates](#)
- [Protected predicates](#)

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

navltree, nbintree

1.53 optionals

object

1.53.1 maybe

Types and predicates for type-checking and handling optional terms. Inspired by Haskell.

Availability:

```
logtalk_load(optionals(loader))
```

Author: Paulo Moura

Version: 0:7:0

Date: 2021-01-03

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
type::type/1
```

```

type::check/2
arbitrary::arbitrary/1
arbitrary::arbitrary/2

```

Uses:

```

optional
optional(Optional)
random
type

```

Remarks:

- Type-checking support: Defines type `maybe(Type)` for checking optional terms where the value hold by the optional term must be of the given type.
- QuickCheck support: Defines clauses for the `arbitrary::arbitrary/1-2` predicates to allow generating random values for the `maybe(Type)` type.

Inherited public predicates:

(none)

- Public predicates
 - `cat/2`
- Protected predicates
- Private predicates
- Operators

Public predicates

`cat/2`

Returns the values stored in the non-empty optional terms.

Compilation flags:

`static`

Template:

`cat(Optionals,Values)`

Mode and number of proofs:

`cat(+list(optional),-list) - one`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`optional`, `optional(Optional)`, `type`, `arbitrary`
`object`

1.53.2 optional

Constructors for optional terms. An optional term is either empty or holds a value. Optional terms should be regarded as opaque terms and always used with the `optional/1` object by passing the optional term as a parameter.

Availability:

```
logtalk_load(optionals(loader))
```

Author: Paulo Moura

Version: 2:1:0

Date: 2021-01-03

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
type::type/1  
type::check/2
```

Remarks:

- Type-checking support: This object also defines a type `optional` for use with the `type` library object.

Inherited public predicates:

(none)

- Public predicates
 - empty/1
 - of/2
 - from_goal/3
 - from_goal/2
 - from_generator/3
 - from_generator/2
- Protected predicates
- Private predicates
- Operators

Public predicates

empty/1

Constructs an empty optional term.

Compilation flags:

static

Template:

empty(Optional)

Mode and number of proofs:

empty(--nonvar) - one

of/2

Constructs an optional term holding the given value.

Compilation flags:

static

Template:

of(Value,Optional)

Mode and number of proofs:

of(@term,--nonvar) - one

from_goal/3

Constructs an optional term holding a value bound by calling the given goal. Returns an empty optional term if the goal fails or throws an error.

Compilation flags:

static

Template:

from_goal(Goal,Value,Optional)

Meta-predicate template:

from_goal(0,*,*)

Mode and number of proofs:

from_goal(+callable,--term,--nonvar) - one

from_goal/2

Constructs an optional term holding a value bound by calling the given closure. Returns an empty optional term if the closure fails or throws an error.

Compilation flags:

static

Template:

from_goal(Closure,Optional)

Meta-predicate template:

from_goal(1,*)

Mode and number of proofs:

from_goal(+callable,--nonvar) - one

`from_generator/3`

Constructs optional terms with the values generated by calling the given goal. On goal error or failure, returns an empty optional.

Compilation flags:

`static`

Template:

`from_generator(Goal,Value,Optional)`

Meta-predicate template:

`from_generator(0,*,*)`

Mode and number of proofs:

`from_generator(+callable,--term,--nonvar) - one_or_more`

`from_generator/2`

Constructs optional terms with the values generated by calling the given closure. On closure error or failure, returns an empty optional.

Compilation flags:

`static`

Template:

`from_generator(Closure,Optional)`

Meta-predicate template:

`from_generator(1,*)`

Mode and number of proofs:

`from_generator(+from_generator,--nonvar) - one_or_more`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`optional(Optional)`, type

object

1.53.3 `optional(Optional)`

Optional term handling predicates. Requires passing an optional term (constructed using the optional object predicates) as a parameter.

Availability:

`logtalk_load(optionals(loader))`

Author: Paulo Moura

Version: 1:7:0

Date: 2019-11-26

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - `is_empty/0`
 - `is_present/0`
 - `if_empty/1`

- if_present/1
- if_present_or_else/2
- filter/2
- map/2
- flat_map/2
- or/2
- get/1
- or_else/2
- or_else_get/2
- or_else_call/2
- or_else_fail/1
- or_else_throw/2
- Protected predicates
- Private predicates
- Operators

Public predicates

is_empty/0

True if the optional term is empty. See also the if_empty/1 predicate.

Compilation flags:

static

Mode and number of proofs:

is_empty - zero_or_one

is_present/0

True if the optional term holds a value. See also the if_present/1 predicate.

Compilation flags:

static

Mode and number of proofs:

is_present - zero_or_one

if_empty/1

Calls a goal if the optional term is empty. Succeeds otherwise.

Compilation flags:

static

Template:

if_empty(Goal)

Meta-predicate template:

if_empty(0)

Mode and number of proofs:

if_empty(+callable) - zero_or_more

if_present/1

Applies a closure to the value hold by the optional term if not empty. Succeeds otherwise.

Compilation flags:

static

Template:

if_present(Closure)

Meta-predicate template:

if_present(1)

Mode and number of proofs:

if_present(+callable) - zero_or_more

`if_present_or_else/2`

Applies a closure to the value hold by the optional term if not empty. Otherwise calls the given goal.

Compilation flags:

`static`

Template:

`if_present_or_else(Closure,Goal)`

Meta-predicate template:

`if_present_or_else(1,0)`

Mode and number of proofs:

`if_present_or_else(+callable,+callable) - zero_or_more`

`filter/2`

Returns the optional term when it is not empty and the value it holds satisfies a closure. Otherwise returns an empty optional term.

Compilation flags:

`static`

Template:

`filter(Closure,NewOptional)`

Meta-predicate template:

`filter(1,*)`

Mode and number of proofs:

`filter(+callable,--nonvar) - one`

`map/2`

When the optional term is not empty and mapping a closure with the value it holds and the new value as additional arguments is successful, returns an optional term with the new value. Otherwise returns an empty optional term.

Compilation flags:

`static`

Template:

map(Closure,NewOptional)

Meta-predicate template:

map(2,*)

Mode and number of proofs:

map(+callable,--nonvar) - one

flat_map/2

When the optional term is not empty and mapping a closure with the value it holds and the new optional term as additional arguments is successful, returns the new optional term. Otherwise returns an empty optional term.

Compilation flags:

static

Template:

flat_map(Closure,NewOptional)

Meta-predicate template:

flat_map(2,*)

Mode and number of proofs:

flat_map(+callable,--nonvar) - one

or/2

Returns the same optional term if not empty. Otherwise calls closure to generate a new optional term. Fails if optional term is empty and calling the closure fails or throws an error.

Compilation flags:

static

Template:

or(NewOptional,Closure)

Meta-predicate template:

or(*,1)

Mode and number of proofs:

or(--term,@callable) - zero_or_one

get/1

Returns the value hold by the optional term if not empty. Throws an error otherwise.

Compilation flags:

static

Template:

get(Value)

Mode and number of proofs:

get(--term) - one_or_error

Exceptions:

Optional is empty:

existence_error(optional_term,Optional)

or_else/2

Returns the value hold by the optional term if not empty or the given default value if the optional term is empty.

Compilation flags:

static

Template:

or_else(Value,Default)

Mode and number of proofs:

or_else(--term,@term) - one

or_else_get/2

Returns the value hold by the optional term if not empty. Applies a closure to compute the value otherwise. Throws an error when the optional term is empty and the value cannot be computed.

Compilation flags:

static

Template:

`or_else_get(Value,Closure)`

Meta-predicate template:

`or_else_get(*,1)`

Mode and number of proofs:

`or_else_get(--term,+callable) - one_or_error`

Exceptions:

Optional is empty and the term cannot be computed:

`existence_error(optional_term,Optional)`

`or_else_call/2`

Returns the value hold by the optional term if not empty or calls a goal deterministically if the optional term is empty.

Compilation flags:

`static`

Template:

`or_else_call(Value,Goal)`

Meta-predicate template:

`or_else_call(*,0)`

Mode and number of proofs:

`or_else_call(--term,+callable) - zero_or_one`

`or_else_fail/1`

Returns the value hold by the optional term if not empty. Fails otherwise. Usually called to skip over empty optional terms.

Compilation flags:

`static`

Template:

`or_else_fail(Value)`

Mode and number of proofs:

`or_else_fail(--term) - zero_or_one`

`or_else_throw/2`

Returns the value hold by the optional term if not empty. Throws the given error otherwise.

Compilation flags:

`static`

Template:

`or_else_throw(Value,Error)`

Mode and number of proofs:

`or_else_throw(--term,@nonvar) - one_or_error`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`optional`

1.54 options

category

1.54.1 options

Options processing predicates. Options are represented by compound terms where the functor is the option name.

Availability:

```
logtalk_load(options(loader))
```

Author: Paulo Moura

Version: 1:2:0

Date: 2022-01-03

Compilation flags:

```
static
```

Implements:

```
public options_protocol
```

Uses:

```
list
```

Remarks:

```
(none)
```

Inherited public predicates:

```
check_option/1 check_options/1 default_option/1 default_options/1 option/2 option/3  
valid_option/1 valid_options/1
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.54.2 options_protocol

Options protocol.

Availability:

logtalk_load(options(loader))

Author: Paulo Moura

Version: 1:2:0

Date: 2022-01-03

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - `check_option/1`
 - `check_options/1`
 - `valid_option/1`
 - `valid_options/1`
 - `default_option/1`
 - `default_options/1`
 - `option/2`
 - `option/3`
- Protected predicates
 - `merge_options/2`
 - `fix_options/2`
 - `fix_option/2`
- Private predicates
- Operators

Public predicates

`check_option/1`

Succeeds if the option is valid. Throws an error otherwise.

Compilation flags:

`static`

Template:

`check_option(Option)`

Mode and number of proofs:

`check_option(@term) - one_or_error`

Exceptions:

Option is a variable:

`in instantiation_error`

Option is neither a variable nor a compound term:

`type_error(compound,Option)`

Option is a compound term but not a valid option:

`domain_error(option,Option)`

check_options/1

Succeeds if all the options in a list are valid. Throws an error otherwise.

Compilation flags:

static

Template:

check_options(Options)

Mode and number of proofs:

check_options(@term) - one_or_error

Exceptions:

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

valid_option/1

Succeeds if the option is valid.

Compilation flags:

static

Template:

valid_option(Option)

Mode and number of proofs:

valid_option(@term) - zero_or_one

valid_options/1

Succeeds if all the options in a list are valid.

Compilation flags:

static

Template:

valid_options(Options)

Mode and number of proofs:

valid_options(@term) - one

default_option/1

Enumerates, by backtracking, the default options.

Compilation flags:

static

Template:

default_option(Option)

Mode and number of proofs:

default_option(?compound) - zero_or_more

default_options/1

Returns a list of the default options.

Compilation flags:

static

Template:

default_options(Options)

Mode and number of proofs:

default_options(-list(compound)) - one

option/2

True iff Option unifies with the first occurrence of the same option in the Options list.

Compilation flags:

static

Template:

option(Option,Options)

Mode and number of proofs:

option(+compound,+list(compound)) - zero_or_one

option/3

True iff Option unifies with the first occurrence of the same option in the Options list or, when that is not the case, if Option unifies with Default.

Compilation flags:

static

Template:

option(Option,Options,Default)

Mode and number of proofs:

option(+compound,+list(compound),+compound) - zero_or_one

Protected predicates

merge_options/2

Merges the user options with the default options, returning the final list of options. Calls the fix_options/2 predicate to preprocess the options after merging. Callers must ensure, if required, that the user options are valid.

Compilation flags:

static

Template:

`merge_options(UserOptions,Options)`

Mode and number of proofs:

`merge_options(+list(compound),-list(compound)) - one`

`fix_options/2`

Fixes a list of options, returning the list of options.

Compilation flags:

`static`

Template:

`fix_options(Options,FixedOptions)`

Mode and number of proofs:

`fix_options(+list(compound),-list(compound)) - one`

`fix_option/2`

Fixes an option.

Compilation flags:

`static`

Template:

`fix_option(Option,FixedOption)`

Mode and number of proofs:

`fix_option(+compound,-compound) - zero_or_one`

Private predicates

(none)

Operators

(none)

See also:

[options](#)

1.55 os

object

1.55.1 os

Portable operating-system access predicates.

Availability:

```
logtalk_load(os(loader))
```

Author: Paulo Moura

Version: 1:101:2

Date: 2024-12-01

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public osp
```

Uses:

```
list
```

Aliases:

```
osp absolute_file_name/2 as expand_path/2
```

Remarks:

- File path expansion: To ensure portability, all file paths are expanded before being handed to the backend Prolog system.
- Exception terms: Currently, there is no standardization of the exception terms thrown by the different backend Prolog systems.
- B-Prolog portability: The `wall_time/1` predicate is not supported.

- CxProlog portability: The `date_time/7` predicate returns zeros for all arguments.
- JIProlog portability: The `file_permission/2` and `command_line_arguments/1` predicates are not supported.
- Quintus Prolog: The `pid/1` and `shell/2` predicates are not supported.
- XSB portability: The `command_line_arguments/1` predicate is not supported.

Inherited public predicates:

`absolute_file_name/2` `change_directory/1` `command_line_arguments/1` `copy_file/2` `cpu_time/1`
`date_time/7` `decompose_file_name/3` `decompose_file_name/4` `delete_directory/1`
`delete_directory_and_contents/1` `delete_directory_contents/1` `delete_file/1` `directory_exists/1`
`directory_files/2` `directory_files/3` `ensure_directory/1` `ensure_file/1` `environment_variable/2`
`file_exists/1` `file_modification_time/2` `file_permission/2` `file_size/2` `full_device_path/1`
`internal_os_path/2` `is_absolute_file_name/1` `make_directory/1` `make_directory_path/1`
`null_device_path/1` `operating_system_machine/1` `operating_system_name/1`
`operating_system_release/1` `operating_system_type/1` `path_concat/3` `pid/1`
`read_only_device_path/1` `rename_file/2` `shell/1` `shell/2` `sleep/1` `temporary_directory/1`
`time_stamp/1` `wall_time/1` `working_directory/1`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`os_types`

`category`

1.55.2 `os_types`

A set of operating-system related types.

Availability:

```
logtalk_load(os(loader))
```

Author: Paulo Moura

Version: 1:4:0

Date: 2021-02-12

Compilation flags:

```
static
```

Provides:

```
type::type/1
```

```
type::check/2
```

Uses:

```
list
```

```
os
```

Remarks:

- **Provided types:** This category adds `file`, `file(Extensions)`, `file(Extensions,Permissions)`, `directory`, `directory(Permissions)`, and `environment_variable` types for type-checking when using the `type` library object.
- **Type `file`:** For checking if a term is an atom and an existing file.
- **Type `file(Extensions)`:** For checking if a term is an atom and an existing file with one of the listed extensions (specified as `'.ext'`).
- **Type `file(Extensions,Permissions)`:** For checking if a term is an atom and an existing file with one of the listed extensions (specified as `'.ext'`) and listed permissions (`{read, write, execute}`).
- **Type `directory`:** For checking if a term is an atom and an existing directory.
- **Type `directory(Permissions)`:** For checking if a term is an atom and an existing directory with the listed permissions (`{read, write, execute}`).
- **Type `environment_variable`:** For checking if a term is an atom and an existing environment variable.

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[osp](#), [os](#), [type](#)

[protocol](#)

1.55.3 osp

Portable operating-system access protocol.

Availability:

`logtalk_load(os(loader))`

Author: Paulo Moura

Version: 1:39:0

Date: 2024-10-14

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

- Error handling: Predicates that require a file or directory to exist throw an error when that is not the case. But the exact exception term is currently backend Prolog compiler dependent.

Inherited public predicates:

(none)

- Public predicates
 - pid/1
 - shell/2
 - shell/1
 - is_absolute_file_name/1
 - absolute_file_name/2
 - decompose_file_name/3
 - decompose_file_name/4
 - path_concat/3
 - internal_os_path/2
 - make_directory/1
 - make_directory_path/1
 - delete_directory/1
 - delete_directory_contents/1
 - delete_directory_and_contents/1
 - change_directory/1
 - working_directory/1
 - temporary_directory/1
 - null_device_path/1
 - full_device_path/1
 - read_only_device_path/1
 - directory_files/2
 - directory_files/3
 - directory_exists/1
 - ensure_directory/1

- file_exists/1
 - file_modification_time/2
 - file_size/2
 - file_permission/2
 - copy_file/2
 - rename_file/2
 - delete_file/1
 - ensure_file/1
 - environment_variable/2
 - time_stamp/1
 - date_time/7
 - cpu_time/1
 - wall_time/1
 - operating_system_type/1
 - operating_system_name/1
 - operating_system_machine/1
 - operating_system_release/1
 - command_line_arguments/1
 - sleep/1
- Protected predicates
 - Private predicates
 - Operators

Public predicates

pid/1

Returns the process identifier of the running process.

Compilation flags:

static

Template:

pid(PID)

Mode and number of proofs:

pid(-integer) - one

shell/2

Runs an operating-system shell command and returns its exit status.

Compilation flags:

static

Template:

shell(Command,Status)

Mode and number of proofs:

shell(+atom,-integer) - one

shell/1

Runs an operating-system shell command.

Compilation flags:

static

Template:

shell(Command)

Mode and number of proofs:

shell(+atom) - zero_or_one

is_absolute_file_name/1

True iff the argument is an absolute file path. On POSIX systems, this predicate is true if File starts with a /. On Windows systems, this predicate is true if File starts with a drive letter. No attempt is made to expand File as a path.

Compilation flags:

static

Template:

is_absolute_file_name(File)

Mode and number of proofs:

is_absolute_file_name(+atom) - zero_or_one

`absolute_file_name/2`

Expands a file name to an absolute file path. An environment variable at the beginning of the file name is also expanded.

Compilation flags:

static

Template:

`absolute_file_name(File,Path)`

Mode and number of proofs:

`absolute_file_name(+atom,-atom) - one`

`decompose_file_name/3`

Decomposes a file name into its directory (which always ends with a slash; `./` is returned if absent) and its basename (which can be the empty atom).

Compilation flags:

static

Template:

`decompose_file_name(File,Directory,Basename)`

Mode and number of proofs:

`decompose_file_name(+atom,?atom,?atom) - one`

`decompose_file_name/4`

Decomposes a file name into its directory (which always ends with a slash; `./` is returned if absent), name (that can be the empty atom), and extension (which starts with a `.` when defined; the empty atom otherwise).

Compilation flags:

static

Template:

```
decompose_file_name(File,Directory,Name,Extension)
```

Mode and number of proofs:

```
decompose_file_name(+atom,?atom,?atom,?atom) - one
```

```
path_concat/3
```

Concatenates a path prefix and a path suffix, adding a / separator if required. Returns Suffix when it is an absolute path. Returns Prefix with a trailing / appended if missing when Suffix is the empty atom.

Compilation flags:

```
static
```

Template:

```
path_concat(Prefix,Suffix,Path)
```

Mode and number of proofs:

```
path_concat(+atom,+atom,--atom) - one
```

```
internal_os_path/2
```

Converts between the internal path representation (which is backend dependent) and the operating-system native path representation.

Compilation flags:

```
static
```

Template:

```
internal_os_path(InternalPath,OSPath)
```

Mode and number of proofs:

```
internal_os_path(+atom,-atom) - one
```

```
internal_os_path(-atom,+atom) - one
```

make_directory/1

Makes a new directory. Succeeds if the directory already exists.

Compilation flags:

static

Template:

make_directory(Directory)

Mode and number of proofs:

make_directory(+atom) - one

make_directory_path/1

Makes a new directory creating all the intermediate directories if necessary. Succeeds if the directory already exists.

Compilation flags:

static

Template:

make_directory_path(Directory)

Mode and number of proofs:

make_directory_path(+atom) - one

delete_directory/1

Deletes an empty directory. Throws an error if the directory does not exist.

Compilation flags:

static

Template:

delete_directory(Directory)

Mode and number of proofs:

delete_directory(+atom) - one_or_error

`delete_directory_contents/1`

Deletes directory contents. Throws an error if the directory does not exist.

Compilation flags:

`static`

Template:

`delete_directory_contents(Directory)`

Mode and number of proofs:

`delete_directory_contents(+atom) - one_or_error`

`delete_directory_and_contents/1`

Deletes directory and its contents. Throws an error if the directory does not exist.

Compilation flags:

`static`

Template:

`delete_directory_and_contents(Directory)`

Mode and number of proofs:

`delete_directory_and_contents(+atom) - one_or_error`

`change_directory/1`

Changes current working directory. Throws an error if the directory does not exist.

Compilation flags:

`static`

Template:

`change_directory(Directory)`

Mode and number of proofs:

`change_directory(+atom) - one_or_error`

`working_directory/1`

Current working directory.

Compilation flags:

`static`

Template:

`working_directory(Directory)`

Mode and number of proofs:

`working_directory(?atom) - zero_or_one`

`temporary_directory/1`

Temporary directory. Tries first environment variables: TEMP and TMP on Windows systems; TMPDIR, TMP, TEMP, and TEMPDIR on POSIX systems. When not defined, tries default locations. Returns the working directory as last resort.

Compilation flags:

`static`

Template:

`temporary_directory(Directory)`

Mode and number of proofs:

`temporary_directory(?atom) - one`

`null_device_path/1`

Null device path: `nul` on Windows systems and `/dev/null` on POSIX systems.

Compilation flags:

`static`

Template:

`null_device_path(Path)`

Mode and number of proofs:

`null_device_path(?atom) - one`

`full_device_path/1`

Full device path: `/dev/full` on Linux and BSD systems. Fails on other systems. Experimental.

Compilation flags:

`static`

Template:

`full_device_path(Path)`

Mode and number of proofs:

`full_device_path(?atom) - zero_or_one`

`read_only_device_path/1`

Read-only device path: `/dev/urandom` on macOS. Fails on other systems. Experimental.

Compilation flags:

`static`

Template:

`read_only_device_path(Path)`

Mode and number of proofs:

`read_only_device_path(?atom) - zero_or_one`

directory_files/2

Returns a list of all files (including directories, regular files, and hidden directories and files) in a directory. File paths are relative to the directory. Throws an error if the directory does not exist.

Compilation flags:

static

Template:

directory_files(Directory,Files)

Mode and number of proofs:

directory_files(+atom,-list(atom)) - one_or_error

directory_files/3

Returns a list of files filtered using the given list of options. Invalid options are ignored. Default option values are equivalent to directory_files/2. Throws an error if the directory does not exist.

Compilation flags:

static

Template:

directory_files(Directory,Files,Options)

Mode and number of proofs:

directory_files(+atom,-list(atom),+list(compound)) - one_or_error

Remarks:

- Option paths/1: Possible values are relative and absolute. Default is relative.
 - Option type/1: Possible values are all, regular, directory. Default is all.
 - Option extensions/1: Argument is a list of required extensions (using the format '.ext'). Default is the empty list.
 - Option prefixes/1: Argument is a list of required file prefixes (atoms). Default is the empty list.
 - Option suffixes/1: Argument is a list of required file suffixes (atoms). Default is the empty list.
 - Option dot_files/1: Possible values are true and false. Default is true.
-

directory_exists/1

True if the specified directory exists (irrespective of directory permissions).

Compilation flags:

static

Template:

directory_exists(Directory)

Mode and number of proofs:

directory_exists(+atom) - zero_or_one

ensure_directory/1

Ensures that a directory exists, creating it if necessary.

Compilation flags:

static

Template:

ensure_directory(Directory)

Mode and number of proofs:

ensure_directory(+atom) - one

file_exists/1

True if the specified file exists and is a regular file (irrespective of file permissions).

Compilation flags:

static

Template:

file_exists(File)

Mode and number of proofs:

file_exists(+atom) - zero_or_one

`file_modification_time/2`

File modification time (which can be used for comparison). Throws an error if the file does not exist.

Compilation flags:

`static`

Template:

`file_modification_time(File,Time)`

Mode and number of proofs:

`file_modification_time(+atom,-integer) - one_or_error`

`file_size/2`

File size (in bytes). Throws an error if the file does not exist.

Compilation flags:

`static`

Template:

`file_size(File,Size)`

Mode and number of proofs:

`file_size(+atom,-integer) - one_or_error`

`file_permission/2`

True iff the specified file has the specified permission (read, write, or execute). Throws an error if the file does not exist.

Compilation flags:

`static`

Template:

`file_permission(File,Permission)`

Mode and number of proofs:

`file_permission(+atom,+atom) - zero_or_one_or_error`

copy_file/2

Copies a file. Throws an error if the original file does not exist or if the copy cannot be created.

Compilation flags:

static

Template:

copy_file(File,Copy)

Mode and number of proofs:

copy_file(+atom,+atom) - one_or_error

rename_file/2

Renames a file or a directory. Throws an error if the file or directory does not exist.

Compilation flags:

static

Template:

rename_file(Old,New)

Mode and number of proofs:

rename_file(+atom,+atom) - one_or_error

delete_file/1

Deletes a file. Throws an error if the file does not exist.

Compilation flags:

static

Template:

delete_file(File)

Mode and number of proofs:

`delete_file(+atom) - one_or_error`

`ensure_file/1`

Ensures that a file exists, creating it if necessary.

Compilation flags:

`static`

Template:

`ensure_file(File)`

Mode and number of proofs:

`ensure_file(+atom) - one`

`environment_variable/2`

Returns an environment variable value. Fails if the variable does not exist.

Compilation flags:

`static`

Template:

`environment_variable(Variable,Value)`

Mode and number of proofs:

`environment_variable(+atom,?atom) - zero_or_one`

`time_stamp/1`

Returns a system-dependent time stamp, which can be used for sorting, but should be regarded otherwise as an opaque term.

Compilation flags:

`static`

Template:

time_stamp(Time)

Mode and number of proofs:

time_stamp(-ground) - one

date_time/7

Returns the current date and time. Note that most backends do not provide sub-second accuracy and in those cases the value of the Milliseconds argument is always zero.

Compilation flags:

static

Template:

date_time(Year,Month,Day,Hours,Minutes,Seconds,Milliseconds)

Mode and number of proofs:

date_time(-integer,-integer,-integer,-integer,-integer,-integer) - one

cpu_time/1

System cpu time in seconds.

Compilation flags:

static

Template:

cpu_time(Seconds)

Mode and number of proofs:

cpu_time(-number) - one

wall_time/1

Wall time in seconds.

Compilation flags:

static

Template:

wall_time(Seconds)

Mode and number of proofs:

wall_time(-number) - one

operating_system_type/1

Operating system type. Possible values are unix, windows, and unknown.

Compilation flags:

static

Template:

operating_system_type(Type)

Mode and number of proofs:

operating_system_type(?atom) - zero_or_one

operating_system_name/1

Operating system name. On POSIX systems, it returns the value of `uname -s`. On Windows systems, it returns 'Windows'.

Compilation flags:

static

Template:

operating_system_name(Name)

Mode and number of proofs:

operating_system_name(?atom) - zero_or_one

`operating_system_machine/1`

Operating system hardware platform. On POSIX systems, it returns the value of `uname -m`. On Windows systems, it returns the value of the `PROCESSOR_ARCHITECTURE` environment variable.

Compilation flags:

`static`

Template:

`operating_system_machine(Machine)`

Mode and number of proofs:

`operating_system_machine(?atom) - zero_or_one`

`operating_system_release/1`

Operating system release. On POSIX systems, it returns the value of `uname -r`. On Windows systems, it uses WMI code.

Compilation flags:

`static`

Template:

`operating_system_release(Release)`

Mode and number of proofs:

`operating_system_release(?atom) - zero_or_one`

`command_line_arguments/1`

Returns a list with the command line arguments that occur after `--`.

Compilation flags:

`static`

Template:

command_line_arguments(Arguments)

Mode and number of proofs:

command_line_arguments(-list(atom)) - one

sleep/1

Suspends execution the given number of seconds.

Compilation flags:

static

Template:

sleep(Seconds)

Mode and number of proofs:

sleep(+number) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

os, os_types

1.56 packs

protocol

1.56.1 pack_protocol

Pack specification protocol. Objects implementing this protocol should be named after the pack with a `_pack` suffix and saved in a file with the same name as the object.

Availability:

```
logtalk_load(packs(loader))
```

Author: Paulo Moura

Version: 0:17:1

Date: 2024-12-18

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - name/1
 - description/1
 - license/1
 - home/1
 - version/6
 - note/3
- Protected predicates
- Private predicates
- Operators

Public predicates

name/1

Pack name.

Compilation flags:
static

Template:
name(Name)
Mode and number of proofs:
name(?atom) - zero_or_one

description/1

Pack one line description.

Compilation flags:
static

Template:
description(Description)
Mode and number of proofs:
description(?atom) - zero_or_one

license/1

Pack license. Specified using the identifier from the SPDX License List (<https://spdx.org/licenses/>) when possible.

Compilation flags:
static

Template:
license(License)
Mode and number of proofs:

license(?atom) - zero_or_one

home/1

Pack home HTTPS or file URL.

Compilation flags:

static

Template:

home(Home)

Mode and number of proofs:

home(?atom) - zero_or_one

version/6

Table of available versions.

Compilation flags:

static

Template:

version(Version,Status,URL,Checksum,Dependencies,Portability)

Mode and number of proofs:

version(?compound,?atom,-atom,-pair(atom,atom),-list(pair(atom,callable)),?atom) - zero_or_more
 version(?compound,?atom,-atom,-pair(atom,atom),-list(pair(atom,callable)),-list(atom)) -
 zero_or_more

Remarks:

- Version: This argument uses the same format as entity versions: Major:Minor:Patch. Semantic versioning should be used.
- Status: Version development status. E.g stable, rc, beta, alpha, or deprecated.
- URL: File URL for a local directory, file URL for a local archive, download HTTPS URL for the pack archive, or download git archive URL for the pack archive.
- Checksum: A pair where the key is the hash algorithm and the value is the checksum. Currently, the hash algorithm must be sha256. For file:// URLs of local directories, use none instead of a pair.

- **Dependencies:** Pack dependencies list. Each dependency is a Dependency Operator Version term. Operator is a term comparison operator. Valid Dependency values are Registry::Pack, os(Name,Machine), logtalk, and a backend identifier atom.
 - **Portability:** Either the atom all or a list of the supported backend Prolog compilers (using the identifier atoms used by the prolog_dialect flag).
 - **Clause order:** Versions must be listed ordered from newest to oldest.
-

note/3

Table of notes per action and version.

Compilation flags:

static

Template:

note(Action,Version,Note)

Mode and number of proofs:

note(?atom,?term,-atom) - zero_or_more

Remarks:

- **Action:** Possible values are install, update, and uninstall. When unbound, the note apply to all actions.
 - **Version:** Version being installed, updated, or uninstalled. When unbound, the note apply to all versions.
 - **Note:** Note to print when performing an action on a pack version.
-

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.56.2 packs

Pack handling predicates.

Availability:

```
logtalk_load(packs(loader))
```

Author: Paulo Moura

Version: 0:81:0

Date: 2024-10-30

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public packs_common
```

```
public options
```

Uses:

```
list
```

```
logtalk
```

```
os
```

```
registries
```

```
type
```

```
user
```

Remarks:

(none)

Inherited public predicates:

```
check_option/1 check_options/1 default_option/1 default_options/1 directory/1 directory/2
help/0 logtalk_packs/0 logtalk_packs/1 option/2 option/3 pin/0 pin/1 pinned/1 prefix/0
prefix/1 readme/1 readme/2 reset/0 setup/0 unpin/0 unpin/1 valid_option/1 valid_options/1
verify_commands_availability/0
```

- Public predicates
 - available/2

- available/1
- available/0
- installed/4
- installed/3
- installed/1
- installed/0
- outdated/4
- outdated/1
- outdated/0
- orphaned/2
- orphaned/0
- versions/3
- describe/2
- describe/1
- search/1
- install/4
- install/3
- install/2
- install/1
- update/3
- update/2
- update/1
- update/0
- uninstall/2
- uninstall/1
- uninstall/0
- clean/2
- clean/1
- clean/0
- save/2
- save/1
- restore/2
- restore/1
- dependents/3
- dependents/2

- dependents/1
- lint/2
- lint/1
- lint/0
- Protected predicates
- Private predicates
- Operators

Public predicates

available/2

Enumerates, by backtracking, all available packs.

Compilation flags:

static

Template:

available(Registry,Pack)

Mode and number of proofs:

available(?atom,?atom) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is neither a variable nor an atom:

type_error(atom,Pack)

available/1

Lists all the packs that are available for installation from the given registry.

Compilation flags:

static

Template:

available(Registry)

Mode and number of proofs:

available(+atom) - one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

available/0

Lists all the packs that are available for installation from all defined registries.

Compilation flags:

static

Mode and number of proofs:

available - one

installed/4

Enumerates by backtracking all installed packs.

Compilation flags:

static

Template:

installed(Registry,Pack,Version,Pinned)

Mode and number of proofs:

installed(?atom,?atom,?compound,?boolean) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Version is neither a variable nor a compound term:

type_error(compound,Version)

Pinned is neither a variable nor a boolean:
`type_error(boolean,Pinned)`

`installed/3`

Enumerates by backtracking all installed packs.

Compilation flags:
`static`

Template:
`installed(Registry,Pack,Version)`

Mode and number of proofs:
`installed(?atom,?atom,?compound) - zero_or_more`

Exceptions:
 Registry is neither a variable nor an atom:
`type_error(atom,Registry)`
 Pack is neither a variable nor an atom:
`type_error(atom,Pack)`
 Version is neither a variable nor a compound term:
`type_error(compound,Version)`

`installed/1`

Lists all the packs that are installed from the given registry. Fails if the registry is unknown.

Compilation flags:
`static`

Template:
`installed(Registry)`

Mode and number of proofs:
`installed(+atom) - zero_or_one`

Exceptions:
 Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

installed/0

Lists all the packs that are installed.

Compilation flags:

static

Mode and number of proofs:

installed - one

outdated/4

Enumerates by backtracking all installed but outdated packs (together with the current version installed and the latest version available).

Compilation flags:

static

Template:

outdated(Registry,Pack,Version,LatestVersion)

Mode and number of proofs:

outdated(?atom,?atom,?compound,?compound) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Version is neither a variable nor a compound term:

type_error(compound,Version)

LatestVersion is neither a variable nor a compound term:

type_error(compound,LatestVersion)

outdated/1

Lists all the packs from the given registry that are installed but outdated.

Compilation flags:

static

Template:

outdated(Registry)

Mode and number of proofs:

outdated(+atom) - one

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

outdated/0

Lists all the packs that are installed but outdated.

Compilation flags:

static

Mode and number of proofs:

outdated - one

orphaned/2

Lists all the packs that are installed but whose registry is no longer defined.

Compilation flags:

static

Template:

orphaned(Registry,Pack)

Mode and number of proofs:

orphaned(?atom,?atom) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is neither a variable nor an atom:

type_error(atom,Pack)

orphaned/0

Lists all the packs that are installed but whose registry is no longer defined.

Compilation flags:

static

Mode and number of proofs:

orphaned - one

versions/3

Returns a list of all available pack versions. Fails if the pack is unknown.

Compilation flags:

static

Template:

versions(Registry,Pack,Versions)

Mode and number of proofs:

versions(+atom,+atom,-list) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:
type_error(atom,Pack)

describe/2

Describes a registered pack, including installed version if applicable. Fails if the pack is unknown.

Compilation flags:

static

Template:

describe(Registry,Pack)

Mode and number of proofs:

describe(+atom,+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

describe/1

Describes a registered pack, including installed version if applicable. Fails if the pack is unknown.

Compilation flags:

static

Template:

describe(Pack)

Mode and number of proofs:

describe(+atom) - zero_or_one

Exceptions:

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

`search/1`

Searches packs whose name or description includes the search term (case sensitive).

Compilation flags:

`static`

Template:

`search(Term)`

Mode and number of proofs:

`search(+atom) - one`

Exceptions:

Term is a variable:

`instantiation_error`

Term is neither a variable nor an atom:

`type_error(atom,Term)`

`install/4`

Installs a new pack using the specified options. Fails if the pack is unknown or already installed but not using `update(true)` or `force(true)` options. Fails also if the pack version is unknown.

Compilation flags:

`static`

Template:

`install(Registry,Pack,Version,Options)`

Mode and number of proofs:

`install(+atom,+atom,++compound,++list(compound)) - zero_or_one`

Exceptions:

Registry is a variable:

`instantiation_error`

Registry is neither a variable nor an atom:

`type_error(atom,Registry)`

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

Version is a variable:

`instantiation_error`

Version is neither a variable nor a valid version:

`type_error(pack_version,Version)`

Options is a variable:

`instantiation_error`

Options is neither a variable nor a list:

`type_error(list,Options)`

An element Option of the list Options is a variable:

`instantiation_error`

An element Option of the list Options is neither a variable nor a compound term:

`type_error(compound,Option)`

An element Option of the list Options is a compound term but not a valid option:

`domain_error(option,Option)`

Remarks:

- `update(Boolean)` option: Update pack if already installed. Default is false. Overrides the `force/1` option.
- `force(Boolean)` option: Force pack re-installation if already installed. Default is false.
- `compatible(Boolean)` option: Restrict installation to compatible packs. Default is true.
- `clean(Boolean)` option: Clean pack archive after installation. Default is false.
- `verbose(Boolean)` option: Verbose installing steps. Default is false.
- `checksum(Boolean)` option: Verify pack archive checksum. Default is true.
- `checksig(Boolean)` option: Verify pack archive signature. Default is false.
- `git(Atom)` option: Extra command-line options. Default is ''.
- `downloader(Atom)` option: Downloader utility. Either `curl` or `wget`. Default is `curl`.
- `curl(Atom)` option: Extra command-line options. Default is ''.
- `wget(Atom)` option: Extra command-line options. Default is ''.
- `gpg(Atom)` option: Extra command-line options. Default is ''.
- `tar(Atom)` option: Extra command-line options. Default is ''.

install/3

Installs the specified version of a pack from the given registry using default options. Fails if the pack is already installed or unknown. Fails also if the pack version is unknown.

Compilation flags:

static

Template:

install(Registry,Pack,Version)

Mode and number of proofs:

install(+atom,+atom,?compound) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Version is a variable:

instantiation_error

Version is neither a variable nor a valid version:

type_error(pack_version,Version)

install/2

Installs the latest version of a pack from the given registry using default options. Fails if the pack is already installed or unknown.

Compilation flags:

static

Template:

install(Registry,Pack)

Mode and number of proofs:

install(+atom,+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

install/1

Installs a pack (if its name is unique among all registries) using default options. Fails if the pack is already installed or unknown. Fails also if the pack is available from multiple registries.

Compilation flags:

static

Template:

install(Pack)

Mode and number of proofs:

install(+atom) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is not an atom:

type_error(atom,Pack)

update/3

Updates an outdated pack to the specified version using the specified options. Fails if the pack or the pack version is unknown or if the pack is not installed. Fails also if the pack is orphaned or pinned and not using a force(true) option.

Compilation flags:

static

Template:

update(Pack,Version,Options)

Mode and number of proofs:

update(+atom,++callable,++list(callable)) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Version is a variable:

instantiation_error

Version is neither a variable nor a valid version:

type_error(pack_version,Version)

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

Remarks:

- install(Boolean) option: Install pack latest version if not already installed. Default is false.
- force(Boolean) option: Force update if the pack is pinned or breaks installed packs. Default is false.
- compatible(Boolean) option: Restrict updating to compatible packs. Default is true.
- clean(Boolean) option: Clean pack archive after updating. Default is false.
- verbose(Boolean) option: Verbose updating steps. Default is false.
- checksum(Boolean) option: Verify pack archive checksum. Default is true.
- checksig(Boolean) option: Verify pack archive signature. Default is false.
- git(Atom) option: Extra command-line options. Default is ''.
- downloader(Atom) option: Downloader utility. Either curl or wget. Default is curl.
- curl(Atom) option: Extra command-line options. Default is ''.
- wget(Atom) option: Extra command-line options. Default is ''.
- gpg(Atom) option: Extra command-line options. Default is ''.
- tar(Atom) option: Extra command-line options. Default is ''.

update/2

Updates an outdated pack to its latest version using the specified options. Fails if the pack is orphaned, unknown, or not installed. Fails also if the pack is pinned and not using a force(true) option.

Compilation flags:

static

Template:

update(Pack,Options)

Mode and number of proofs:

update(+atom,++list(callable)) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

Remarks:

- install(Boolean) option: Install pack latest version if not already installed. Default is false.
- force(Boolean) option: Force update if the pack is pinned or breaks installed packs. Default is false.
- compatible(Boolean) option: Restrict updating to compatible packs. Default is true.
- clean(Boolean) option: Clean pack archive after updating. Default is false.
- verbose(Boolean) option: Verbose updating steps. Default is false.
- checksum(Boolean) option: Verify pack archive checksum. Default is true.
- checksig(Boolean) option: Verify pack archive signature. Default is false.
- git(Atom) option: Extra command-line options. Default is ''.
- downloader(Atom) option: Downloader utility. Either curl or wget. Default is curl.
- curl(Atom) option: Extra command-line options. Default is ''.

- `wget(Atom)` option: Extra command-line options. Default is ''.
 - `gpg(Atom)` option: Extra command-line options. Default is ''.
 - `tar(Atom)` option: Extra command-line options. Default is ''.
-

`update/1`

Updates an outdated pack to its latest version using default options. Fails if the pack is pinned, orphaned, not installed, unknown, or breaks installed packs.

Compilation flags:

`static`

Template:

`update(Pack)`

Mode and number of proofs:

`update(+atom) - zero_or_one`

Exceptions:

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

`update/0`

Updates all outdated packs (that are not pinned) using default options.

Compilation flags:

`static`

Mode and number of proofs:

`update - zero_or_one`

uninstall/2

Uninstalls a pack using the specified options. Fails if the pack is unknown or not installed. Fails also if the pack is pinned or have dependents and not using a force(true) option.

Compilation flags:

static

Template:

uninstall(Pack,Options)

Mode and number of proofs:

uninstall(+atom,++list(compound)) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

Remarks:

- force(Boolean) option: Force deletion if the pack is pinned. Default is false.
- clean(Boolean) option: Clean pack archive after deleting. Default is false.
- verbose(Boolean) option: Verbose uninstalling steps. Default is false.

uninstall/1

Uninstalls a pack using default options. Fails if the pack is pinned, have dependents, not installed, or unknown.

Compilation flags:

static

Template:

uninstall(Pack)

Mode and number of proofs:

uninstall(+atom) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

uninstall/0

Uninstalls all packs using the force(true) option.

Compilation flags:

static

Mode and number of proofs:

uninstall - zero_or_one

clean/2

Cleans all pack archives. Fails if the the pack is unknown.

Compilation flags:

static

Template:

`clean(Registry,Pack)`

Mode and number of proofs:

`clean(+atom,+atom) - zero_or_one`

Exceptions:

Registry is a variable:

`instantiation_error`

Registry is neither a variable nor an atom:

`type_error(atom,Registry)`

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

`clean/1`

Cleans all pack archives. Fails if the pack is unknown.

Compilation flags:

`static`

Template:

`clean(Pack)`

Mode and number of proofs:

`clean(+atom) - zero_or_one`

Exceptions:

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

clean/0

Cleans all archives for all packs.

Compilation flags:

static

Mode and number of proofs:

clean - one

save/2

Saves a list of all installed packs and registries plus pinning status to a file using the given options. Registries without installed packs are saved when using the option `save(all)` and skipped when using the option `save(installed)` (default).

Compilation flags:

static

Template:

save(File,Options)

Mode and number of proofs:

save(+atom,++list(compound)) - one_or_error

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an existing file but cannot be written:

permission_error(open,source_sink,File)

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

save/1

Saves a list of all installed packs and their registries plus pinning status to a file using default options.

Compilation flags:

static

Template:

save(File)

Mode and number of proofs:

save(+atom) - one_or_error

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an existing file but cannot be written:

permission_error(open,source_sink,File)

restore/2

Restores a list of registries and packs plus their pinning status from a file using the given options. Fails if restoring is not possible.

Compilation flags:

static

Template:

restore(File,Options)

Mode and number of proofs:

restore(+atom,++list(compound)) - zero_or_one_or_error

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)
File is an atom but not an existing file:
existence_error(file,File)
File is an existing file but cannot be read:
permission_error(open,source_sink,File)
Options is a variable:
instantiation_error
Options is neither a variable nor a list:
type_error(list,Options)
An element Option of the list Options is a variable:
instantiation_error
An element Option of the list Options is neither a variable nor a compound term:
type_error(compound,Option)
An element Option of the list Options is a compound term but not a valid option:
domain_error(option,Option)

Remarks:

- force(Boolean) option: Force restoring if a registry is already defined or a pack is already installed. Default is true.
- compatible(Boolean) option: Restrict installation to compatible packs. Default is true.
- clean(Boolean) option: Clean registry and pack archives after restoring. Default is false.
- verbose(Boolean) option: Verbose restoring steps. Default is false.
- checksum(Boolean) option: Verify pack archive checksums. Default is true.
- checksig(Boolean) option: Verify pack archive signatures. Default is false.
- git(Atom) option: Extra command-line options. Default is ''.
- downloader(Atom) option: Downloader utility. Either curl or wget. Default is curl.
- curl(Atom) option: Extra command-line options. Default is ''.
- wget(Atom) option: Extra command-line options. Default is ''.
- gpg(Atom) option: Extra command-line options. Default is ''.
- tar(Atom) option: Extra command-line options. Default is ''.

restore/1

Restores a list of registries and packs plus their pinning status from a file using default options. Fails if restoring is not possible.

Compilation flags:

static

Template:

restore(File)

Mode and number of proofs:

restore(+atom) - zero_or_one_or_error

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)

File is an existing file but cannot be read:

permission_error(open,source_sink,File)

dependents/3

Returns a list of all installed packs that depend on the given pack from the given registry. Fails if the pack is unknown.

Compilation flags:

static

Template:

dependents(Registry,Pack,Dependents)

Mode and number of proofs:

dependents(+atom,+atom,-list(atom)) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

dependents/2

Prints a list of all installed packs that depend on the given pack from the given registry. Fails if the pack is unknown.

Compilation flags:

static

Template:

dependents(Registry,Pack)

Mode and number of proofs:

dependents(+atom,+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

dependents/1

Prints a list of all installed packs that depend on the given pack if unique from all defined registries. Fails if the pack is unknown or available from multiple registries.

Compilation flags:

static

Template:

dependents(Pack)

Mode and number of proofs:

dependents(+atom) - zero_or_one

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

lint/2

Checks the pack specification. Fails if the pack is unknown or if linting detects errors.

Compilation flags:

`static`

Template:

`lint(Registry,Pack)`

Mode and number of proofs:

`lint(+atom,+atom) - zero_or_one`

Exceptions:

Registry is a variable:

`instantiation_error`

Registry is neither a variable nor an atom:

`type_error(atom,Registry)`

Pack is a variable:

`instantiation_error`

Pack is neither a variable nor an atom:

`type_error(atom,Pack)`

lint/1

Checks the pack specification. Fails if the pack is unknown, or available from multiple registries, or if linting detects errors.

Compilation flags:

`static`

Template:

`lint(Pack)`

Mode and number of proofs:

`lint(+atom) - zero_or_one`

Exceptions:

Pack is a variable:

instantiation_error

Pack is neither a variable nor an atom:

type_error(atom,Pack)

lint/0

Checks all pack specifications.

Compilation flags:

static

Mode and number of proofs:

lint - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.56.3 packs_common

Common predicates for the packs tool objects.

Availability:

logtalk_load(packs(loader))

Author: Paulo Moura

Version: 0:32:1
Date: 2024-10-13

Compilation flags:
static

Provides:
type::type/1
type::check/2

Uses:
list
logtalk
os
type
user

Remarks:
(none)

Inherited public predicates:
(none)

- Public predicates
 - setup/0
 - reset/0
 - verify_commands_availability/0
 - help/0
 - pin/1
 - pin/0
 - unpin/1
 - unpin/0
 - pinned/1
 - directory/2
 - directory/1
 - readme/2
 - readme/1
 - logtalk_packs/1
 - logtalk_packs/0

- prefix/1
- prefix/0
- Protected predicates
 - readme_file_path/2
 - print_readme_file_path/1
 - command/2
 - load_registry/1
 - tar_command/1
 - supported_archive/1
 - supported_url_archive/1
 - decode_url_spaces/2
- Private predicates
- Operators

Public predicates

setup/0

Ensures that registries and packs directory structure exists. Preserves any defined registries and installed packs.

Compilation flags:

static

Mode and number of proofs:

setup - one

reset/0

Resets registries and packs directory structure. Deletes any defined registries and installed packs.

Compilation flags:

static

Mode and number of proofs:

reset - one

verify_commands_availability/0

Verifies required shell commands availability. Fails printing an error message if a command is missing.

Compilation flags:

static

Mode and number of proofs:

verify_commands_availability - zero_or_one

help/0

Provides help about the main predicates.

Compilation flags:

static

Mode and number of proofs:

help - one

pin/1

Pins a resource (pack or registry) preventing it from being updated, uninstalled, or deleted. Fails if the resource is not found.

Compilation flags:

static

Template:

pin(Resource)

Mode and number of proofs:

pin(+atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

pin/0

Pins all resource (packs or registries) preventing them from being updated, uninstalled, or deleted. Note that resources added after calling this predicate will not be pinned.

Compilation flags:

static

Mode and number of proofs:

pin - one

unpin/1

Unpins a resource (pack or registry), allowing it to be updated, uninstalled, or deleted. Fails if the resource is not found.

Compilation flags:

static

Template:

unpin(Resource)

Mode and number of proofs:

unpin(+atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

unpin/0

Unpins all resources (packs or registries), allowing them to be updated, uninstalled, or deleted.

Compilation flags:

static

Mode and number of proofs:

unpin - one

pinned/1

True iff the resource (pack or registry) is defined or installed and if it is pinned.

Compilation flags:

static

Template:

pinned(Resource)

Mode and number of proofs:

pinned(+atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

directory/2

Enumerates by backtracking all packs or registries and respective installation or definition directories (using the internal backend format).

Compilation flags:

static

Template:

directory(Resource,Directory)

Mode and number of proofs:

directory(?atom,?atom) - zero_or_more

Exceptions:

Resource is neither a variable nor an atom:

type_error(atom,Resource)

Directory is neither a variable nor an atom:

type_error(atom,Directory)

directory/1

Prints the directory where the registry or the pack is installed (using the native operating-system format).

Compilation flags:

static

Template:

directory(Resource)

Mode and number of proofs:

directory(+atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

readme/2

Returns the path to the resource (pack or registry) readme file (using the internal backend format). Fails if the resource is not defined or installed or if no readme file is found for it.

Compilation flags:

static

Template:

readme(Resource,ReadMeFile)

Mode and number of proofs:

readme(+atom,-atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

ReadMeFile is neither a variable nor an atom:

type_error(atom,ReadMeFile)

readme/1

Prints the path to the resource (pack or registry) readme file (using the native operating-system format). Fails if the resource is not defined or installed or if no readme file is found for it.

Compilation flags:

static

Template:

readme(Resource)

Mode and number of proofs:

readme(+atom) - zero_or_one

Exceptions:

Resource is a variable:

instantiation_error

Resource is neither a variable nor an atom:

type_error(atom,Resource)

logtalk_packs/1

Returns the directory prefix (using the internal backend format) where the registries, packs, and archives are installed.

Compilation flags:

static

Template:

logtalk_packs(LogtalkPacks)

Mode and number of proofs:

logtalk_packs(-atom) - one

Exceptions:

LogtalkPacks is neither a variable nor an atom:

type_error(atom,LogtalkPacks)

logtalk_packs/0

Prints the directory prefix (using the native operating-system format) where the registries, packs, and archives are installed.

Compilation flags:

static

Mode and number of proofs:

logtalk_packs - one

prefix/1

Returns the directory prefix (using the internal backend format) where the registries or packs are installed.

Compilation flags:

static

Template:

prefix(Prefix)

Mode and number of proofs:

prefix(-atom) - one

Exceptions:

Prefix is neither a variable nor an atom:

type_error(atom,Prefix)

prefix/0

Prints the directory prefix (using the native operating-system format) where the registries or packs are installed.

Compilation flags:

static

Mode and number of proofs:

prefix - one

Protected predicates

readme_file_path/2

Returns the absolute path for the given directory readme file if it exists.

Compilation flags:

static

Template:

readme_file_path(Directory,ReadMeFile)

Mode and number of proofs:

readme_file_path(+atom,-atom) - zero_or_one

Remarks:

- Valid file names: Case variations of README and NOTES with or without a .md or .txt extension. The recommended file name is README.md.
-

`print_readme_file_path/1`

Prints the absolute path for the given directory readme file if it exists. Succeeds otherwise.

Compilation flags:

`static`

Template:

`print_readme_file_path(Directory)`

Mode and number of proofs:

`print_readme_file_path(+atom) - one`

`command/2`

Executes a shell command. Prints an error message and fails if the command fails.

Compilation flags:

`static`

Template:

`command(Command,FailureMessage)`

Mode and number of proofs:

`command(+atom,@nonvar) - zero_or_one`

`load_registry/1`

Loads all registry files from the given directory.

Compilation flags:

`static`

Template:

`load_registry(Directory)`

Mode and number of proofs:

`load_registry(+atom) - zero_or_one`

tar_command/1

Returns the name of the tar command to be used depending on the operating-system.

Compilation flags:

static

Template:

tar_command(Command)

Mode and number of proofs:

tar_command(-atom) - one

supported_archive/1

True iff the archive format is supported.

Compilation flags:

static

Template:

supported_archive(Extension)

Mode and number of proofs:

supported_archive(+atom) - zero_or_one

supported_url_archive/1

True iff the URL archive is supported.

Compilation flags:

static

Template:

supported_url_archive(URL)

Mode and number of proofs:

supported_url_archive(+atom) - zero_or_one

`decode_url_spaces/2`

Decodes encoded spaces (%20) in URLs to spaces.

Compilation flags:

`static`

Template:

`decode_url_spaces(URL,Decoded)`

Mode and number of proofs:

`decode_url_spaces(+atom,-atom) - one`

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.56.4 packs_messages

Packs default message translations.

Availability:

`logtalk_load(packs(loader))`

Author: Paulo Moura

Version: 0:38:0

Date: 2024-10-30

Compilation flags:

`static`

Provides:

`logtalk::message_prefix_stream/4`

`logtalk::message_tokens//2`

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.56.5 packs_specs_hook

Hook object for filtering registry and pack specification file contents.

Availability:

logtalk_load(packs(loader))

Author: Paulo Moura

Version: 0:13:0

Date: 2022-06-28

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Uses:

character

logtalk

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.56.6 registries

Registry handling predicates.

Availability:

```
logtalk_load(packs(loader))
```

Author: Paulo Moura

Version: 0:60:0

Date: 2024-10-09

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public packs_common
```

```
public options
```

Uses:

```
list
```

```
logtalk
```

```
os
```

```
type
```

```
user
```

Remarks:

```
(none)
```

Inherited public predicates:

```
check_option/1 check_options/1 default_option/1 default_options/1 directory/1 directory/2  
help/0 logtalk_packs/0 logtalk_packs/1 option/2 option/3 pin/0 pin/1 pinned/1 prefix/0  
prefix/1 readme/1 readme/2 reset/0 setup/0 unpin/0 unpin/1 valid_option/1 valid_options/1  
verify_commands_availability/0
```

- Public predicates

- list/0

- describe/1

- defined/4

- add/3

- add/2

- add/1

- update/2
- update/1
- update/0
- delete/2
- delete/1
- delete/0
- clean/1
- clean/0
- provides/2
- lint/1
- lint/0
- Protected predicates
- Private predicates
- Operators

Public predicates

list/0

Prints a list of all defined registries, including how defined (git, archive, or directory) and if they are pinned.

Compilation flags:

static

Mode and number of proofs:

list - one

describe/1

Prints all registry entries.

Compilation flags:

static

Template:

describe(Registry)

Mode and number of proofs:

describe(+atom) - one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

defined/4

Enumerates by backtracking all defined registries, their definition URL, how they are defined (git, archive, or directory), and if they are pinned.

Compilation flags:

static

Template:

defined(Registry,URL,HowDefined,Pinned)

Mode and number of proofs:

defined(?atom,?atom,?atom,?boolean) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

URL is neither a variable nor an atom:

type_error(atom,URL)

HowDefined is neither a variable nor an atom:

type_error(atom,HowDefined)

Pinned is neither a variable nor a boolean:

type_error(boolean,Pinned)

add/3

Adds a new registry using the given options. Fails if the registry cannot be added or if it is already defined but not using `update(true)` or `force(true)` options. A `file:// URL` can be used for a local directory.

Compilation flags:

`static`

Template:

`add(Registry,URL,Options)`

Mode and number of proofs:

`add(+atom,+atom,++list(compound)) - zero_or_one`

Exceptions:

Registry is a variable:

`instantiation_error`

Registry is neither a variable nor an atom:

`type_error(atom,Registry)`

URL is a variable:

`instantiation_error`

URL is neither a variable nor an atom:

`type_error(atom,URL)`

Options is a variable:

`instantiation_error`

Options is neither a variable nor a list:

`type_error(list,Options)`

An element Option of the list Options is a variable:

`instantiation_error`

An element Option of the list Options is neither a variable nor a compound term:

`type_error(compound,Option)`

An element Option of the list Options is a compound term but not a valid option:

`domain_error(option,Option)`

Remarks:

- Registry name: Must be the URL basename when using a git URL or a local directory URL. Must also be the declared registry name in the registry specification object.
- HTTPS URLs: Must end with either a `.git` extension or an archive extension.
- `update(Boolean)` option: Update registry if already defined. Default is `false`. Overrides the `force/1` option.
- `force(Boolean)` option: Force registry re-installation if already defined by first deleting the previous installation. Default is `false`.
- `clean(Boolean)` option: Clean registry archive after updating. Default is `false`.

- verbose(Boolean) option: Verbose adding steps. Default is false.
- downloader(Atom) option: Downloader utility. Either curl or wget. Default is curl.
- curl(Atom) option: Extra command-line options. Default is ''.
- wget(Atom) option: Extra command-line options. Default is ''.
- gpg(Atom) option: Extra command-line options. Default is ''.
- tar(Atom) option: Extra command-line options. Default is ''.

add/2

Adds a new registry using default options. Fails if the registry cannot be added or if it is already defined. HTTPS URLs must end with either a .git extension or a an archive extension. A file:// URL can be used for a local directory.

Compilation flags:

static

Template:

add(Registry,URL)

Mode and number of proofs:

add(+atom,+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

URL is a variable:

instantiation_error

URL is neither a variable nor an atom:

type_error(atom,URL)

Remarks:

- Registry name: Must be the URL basename when using a git URL or a local directory URL. Must also be the declared registry name in the registry specification object.

add/1

Adds a new registry from a git cloning or local directory URL using default options. Fails if the registry cannot be added or if it is already defined. HTTPS URLs must end with a .git extension. A file:// URL can be used for a local directory.

Compilation flags:

static

Template:

add(URL)

Mode and number of proofs:

add(+atom) - zero_or_one

Exceptions:

URL is a variable:

instantiation_error

URL is neither a variable nor an atom:

type_error(atom,URL)

Remarks:

- Limitations: Cannot be used for archive download URLs.
 - Registry name: Taken from the URL basename.
-

update/2

Updates a defined registry using the specified options. Fails if the registry is not defined.

Compilation flags:

static

Template:

update(Registry,Options)

Mode and number of proofs:

update(+atom,++list(compound)) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

```

    type_error(atom,Registry)
Options is a variable:
    instantiation_error
Options is neither a variable nor a list:
    type_error(list,Options)
An element Option of the list Options is a variable:
    instantiation_error
An element Option of the list Options is neither a variable nor a compound term:
    type_error(compound,Option)
An element Option of the list Options is a compound term but not a valid option:
    domain_error(option,Option)

```

Remarks:

- `force(Boolean)` option: Force update if the registry is pinned. Default is false.
- `clean(Boolean)` option: Clean registry archive after updating. Default is false.
- `verbose(Boolean)` option: Verbose updating steps. Default is false.
- `downloader(Atom)` option: Downloader utility. Either curl or wget. Default is curl.
- `curl(Atom)` option: Extra command-line options. Default is ''.
- `wget(Atom)` option: Extra command-line options. Default is ''.
- `gpg(Atom)` option: Extra command-line options. Default is ''.
- `tar(Atom)` option: Extra command-line options. Default is ''.

update/1

Updates a defined registry using default options. Fails if the registry is not defined.

Compilation flags:

```
static
```

Template:

```
update(Registry)
```

Mode and number of proofs:

```
update(+atom) - zero_or_one
```

Exceptions:

Registry is a variable:

```
instantiation_error
```

Registry is neither a variable nor an atom:

```
type_error(atom,Registry)
```

update/0

Updates all defined registries using default options.

Compilation flags:

static

Mode and number of proofs:

update - zero_or_one

delete/2

Deletes a registry using the specified options (if not pinned).

Compilation flags:

static

Template:

delete(Registry,Options)

Mode and number of proofs:

delete(+atom,++list(compound)) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Options is a variable:

instantiation_error

Options is neither a variable nor a list:

type_error(list,Options)

An element Option of the list Options is a variable:

instantiation_error

An element Option of the list Options is neither a variable nor a compound term:

type_error(compound,Option)

An element Option of the list Options is a compound term but not a valid option:

domain_error(option,Option)

Remarks:

- `force(Boolean)` option: Force deletion if the registry is pinned or there are installed registry packs. Default is false.
 - `clean(Boolean)` option: Clean registry archive after deleting. Default is false.
 - `verbose(Boolean)` option: Verbose deleting steps. Default is false.
 - `downloader(Atom)` option: Downloader utility. Either curl or wget. Default is curl.
 - `curl(Atom)` option: Extra command-line options. Default is ''.
 - `wget(Atom)` option: Extra command-line options. Default is ''.
 - `gpg(Atom)` option: Extra command-line options. Default is ''.
 - `tar(Atom)` option: Extra command-line options. Default is ''.
-

`delete/1`

Deletes a registry using default options.

Compilation flags:

`static`

Template:

`delete(Registry)`

Mode and number of proofs:

`delete(+atom) - zero_or_one`

Exceptions:

Registry is a variable:

`instantiate_1_error`

Registry is neither a variable nor an atom:

`type_error(atom,Registry)`

delete/0

Deletes all registries using the force(true) option.

Compilation flags:

static

Mode and number of proofs:

delete - zero_or_one

clean/1

Cleans all registry archives. Fails if the registry is not defined.

Compilation flags:

static

Template:

clean(Registry)

Mode and number of proofs:

clean(+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

clean/0

Cleans all archives for all registries.

Compilation flags:

static

Mode and number of proofs:

clean - one

provides/2

Enumerates by backtracking all packs provided by a registry.

Compilation flags:

static

Template:

provides(Registry,Pack)

Mode and number of proofs:

provides(?atom,?atom) - zero_or_more

Exceptions:

Registry is neither a variable nor an atom:

type_error(atom,Registry)

Pack is neither a variable nor an atom:

type_error(atom,Pack)

lint/1

Checks the registry specification. Fails if the registry is not defined or if linting detects errors.

Compilation flags:

static

Template:

lint(Registry)

Mode and number of proofs:

lint(+atom) - zero_or_one

Exceptions:

Registry is a variable:

instantiation_error

Registry is neither a variable nor an atom:

type_error(atom,Registry)

lint/0

Checks all registry specifications.

Compilation flags:
static

Mode and number of proofs:
lint - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)
object

1.56.7 registry_loader_hook

Hook object for filtering registry loader file contents.

Availability:
logtalk_load(packs(loader))

Author: Paulo Moura
Version: 0:13:0
Date: 2022-11-20

Compilation flags:
static, context_switching_calls

Implements:

public expanding

Uses:

character

logtalk

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.56.8 registry_protocol

Registry specification protocol. Objects implementing this protocol should be named after the pack with a `_registry` suffix and saved in a file with the same name as the object.

Availability:

```
logtalk_load(packs(loader))
```

Author: Paulo Moura

Version: 0:12:0

Date: 2022-06-28

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - name/1
 - description/1
 - home/1
 - clone/1
 - archive/1
 - note/2
- Protected predicates
- Private predicates
- Operators

Public predicates

name/1

Registry name. Preferably a valid unquoted atom.

Compilation flags:

static

Template:

name(Name)

Mode and number of proofs:

name(?atom) - zero_or_one

description/1

Registry one line description.

Compilation flags:

static

Template:

description(Description)

Mode and number of proofs:

description(?atom) - zero_or_one

home/1

Registry home HTTPS or file URL.

Compilation flags:

static

Template:

home(Home)

Mode and number of proofs:

home(?atom) - zero_or_one

clone/1

Registry git clone HTTPS URL (must end with the .git extension). Git repos should have the same name as the registry.

Compilation flags:
static

Template:
clone(URL)

Mode and number of proofs:
clone(?atom) - zero_or_one

archive/1

Registry archive download HTTPS URL.

Compilation flags:
static

Template:
archive(URL)

Mode and number of proofs:
archive(?atom) - zero_or_one

note/2

Table of notes per action.

Compilation flags:
static

Template:
note(Action,Note)

Mode and number of proofs:

`note(?atom,-atom) - zero_or_more`

Remarks:

- Action: Possible values are add, update, and delete. When unbound, the note apply to all actions.
 - Note: Note to print when performing an action on a registry.
-

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.57 pddl_parser

object

1.57.1 pddl

Simple parser of PDDL 3.0 files.

Availability:

`logtalk_load(pddl_parser(loader))`

Author: Robert Sasak, Charles University in Prague. Adapted to Logtalk by Paulo Moura.

Version: 1:2:2

Date: 2024-03-14

Compilation flags:

`static, context_switching_calls`

Imports:

`public read_file`

Uses:

user

Remarks:

(none)

Inherited public predicates:

read_file/2

- Public predicates
 - parse_domain/3
 - parse_domain/2
 - parse_problem/2
 - parse_problem/3
- Protected predicates
- Private predicates
- Operators

Public predicates

parse_domain/3

Parses a PDDL 3.0 domain file, returning a compound term representing its contents and rest of the file. Useful when domain and problem are in one file.

Compilation flags:

static

Template:

parse_domain(File,Output,RestOfFile)

Mode and number of proofs:

parse_domain(+atom,-compound,-list(atom)) - one

parse_domain/2

Parses a PDDL 3.0 domain file, returning a compound term representing its contents.

Compilation flags:

static

Template:

parse_domain(File,Output)

Mode and number of proofs:

parse_domain(+atom,-compound) - one

parse_problem/2

Parses a PDDL 3.0 problem file, returning a compound term representing its contents.

Compilation flags:

static

Template:

parse_problem(File,Output)

Mode and number of proofs:

parse_problem(+atom,-compound) - one

parse_problem/3

Parses a PDDL 3.0 problem file, returning a compound term representing its contents and rest of the file. Useful when domain and problem are in one file.

Compilation flags:

static

Template:

parse_problem(File,Output,RestOfFile)

Mode and number of proofs:

parse_problem(+atom,-compound,-list(atom)) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.57.2 read_file

Utility predicates for parsing a file as a list of atoms.

Availability:

`logtalk_load(pddl_parser(loader))`

Author: Robert Sasak, Charles University in Prague. Adapted to Logtalk by Paulo Moura.

Version: 1:0:0

Date: 2011-08-04

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
 - [read_file/2](#)

- Protected predicates
- Private predicates
- Operators

Public predicates

`read_file/2`

Reads a file character by character, parsing it into a list of atoms.

Compilation flags:

`static`

Template:

`read_file(File,List)`

Mode and number of proofs:

`read_file(+atom,-list(atom)) - one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.58 ports_profiler

object

1.58.1 ports_profiler

Predicate execution box model port profiler.

Availability:

```
logtalk_load(ports_profiler(loader))
```

Author: Paulo Moura

Version: 2:0:0

Date: 2024-05-18

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::debug_handler/1
```

```
logtalk::debug_handler/3
```

Uses:

```
logtalk
```

```
user
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - start/0
 - stop/0
 - data/0
 - data/1
 - data/2
 - reset/0
 - reset/1
 - port/5
 - clause_location/6
 - clause/5

- Protected predicates
- Private predicates
 - clause_location_/6
 - port_/5
 - clause_/5
 - entity_defines_/2
- Operators

Public predicates

start/0

Activates thr ports profiler for followup goals.

Compilation flags:

static

Mode and number of proofs:

start - one

stop/0

Deactivates thr ports profiler.

Compilation flags:

static

Mode and number of proofs:

stop - one

data/0

Prints a table with all port profiling data.

Compilation flags:

static

Mode and number of proofs:

data - one

data/1

Prints a table with all port profiling data for the specified entity.

Compilation flags:

static

Template:

data(Entity)

Mode and number of proofs:

data(+entity__identifier) - one

data/2

Prints a table with all port profiling data for the specified entity predicate (or non-terminal).

Compilation flags:

static

Template:

data(Entity,Predicate)

Mode and number of proofs:

data(+entity__identifier,+predicate__indicator) - one

data(+entity__identifier,+non__terminal__indicator) - one

reset/0

Resets all port profiling data.

Compilation flags:

static

Mode and number of proofs:

reset - one

reset/1

Resets all port profiling data for the specified entity.

Compilation flags:

static

Template:

reset(Entity)

Mode and number of proofs:

reset(+entity_identifier) - one

port/5

Enumerates, by backtracking, all collected port profiling data.

Compilation flags:

static

Template:

port(Port,Entity,Functor,Arity,Count)

Mode and number of proofs:

port(?atom,?entity_identifier,?atom,?integer,?integer) - zero_or_more

clause_location/6

Enumerates, by backtracking, all collected profiled clause location data.

Compilation flags:

static

Template:

clause_location(Entity, Functor, Arity, ClauseNumber, File, BeginLine)

Mode and number of proofs:

clause_location(?entity__identifier, ?atom, ?integer, ?integer, ?atom, ?integer) - zero_or_more

clause/5

Enumerates, by backtracking, all collected clause profiling data.

Compilation flags:

dynamic

Template:

clause(Entity, Functor, Arity, ClauseNumber, Count)

Mode and number of proofs:

clause(?entity__identifier, ?atom, ?integer, ?integer, ?integer) - zero_or_more

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

clause_location_/6

Internal table of collected profiled clause location data.

Compilation flags:

dynamic

Template:

clause_location_(Entity, Functor, Arity, ClauseNumber, File, BeginLine)

Mode and number of proofs:

clause_location_(?entity__identifier, ?atom, ?integer, ?integer, ?atom, ?integer) - zero_or_more

port_/5

Internal table of collected port profiling data.

Compilation flags:

dynamic

Template:

port_(Port, Entity, Functor, Arity, Count)

Mode and number of proofs:

port_(?atom, ?entity__identifier, ?atom, ?integer, ?integer) - zero_or_more

clause_/5

Internal table of collected clause profiling data.

Compilation flags:

dynamic

Template:

clause_(Entity, Functor, Arity, ClauseNumber, Count)

Mode and number of proofs:

clause_(?entity__identifier, ?atom, ?integer, ?integer, ?integer) - zero_or_more

entity_defines_/2

Internal cache for profiled predicates.

Compilation flags:

dynamic

Template:

entity_defines_(Entity,Predicate)

Mode and number of proofs:

entity_defines_(?entity_identifier,?predicate_indicator) - zero_or_more

Operators

(none)

1.59 queues

object

1.59.1 queue

Queue predicates implemented using difference lists.

Availability:

logtalk_load(queues(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2020-12-09

Compilation flags:

static, context_switching_calls

Implements:

public queuep

Extends:

public compound

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 append/3 as_list/2 check/1 depth/2
empty/1 ground/1 head/2 join/3 join_all/3 jump/3 jump_all/3 jump_all_block/3 length/2
map/2 map/3 new/1 numbervars/1 numbervars/3 occurs/2 serve/3 singletons/2 subsumes/2
subterm/2 valid/1 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.59.2 queuep

Queue protocol.

Availability:

logtalk_load(queues(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2020-12-09

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - empty/1
 - head/2
 - join/3
 - join_all/3
 - jump/3
 - jump_all/3
 - jump_all_block/3
 - append/3
 - length/2
 - serve/3
 - as_list/2
 - map/2
 - map/3
- Protected predicates
- Private predicates
- Operators

Public predicates

empty/1

True if the queue is empty.

Compilation flags:

static

Template:

empty(Queue)

Mode and number of proofs:

empty(@queue) - zero_or_one

head/2

Unifies Head with the first element of the queue.

Compilation flags:

static

Template:

head(Queue,Head)

Mode and number of proofs:

head(+queue,?term) - zero_or_one

join/3

Adds the new element at the end of the queue.

Compilation flags:

static

Template:

join(Element,Queue,NewQueue)

Mode and number of proofs:

join(@term,+queue,-queue) - zero_or_one

join_all/3

Adds the new elements at the end of the queue. The elements are added in the same order that they appear in the list.

Compilation flags:

static

Template:

join_all(List,Queue,NewQueue)

Mode and number of proofs:

join_all(+list,+queue,-queue) - zero_or_one

jump/3

Adds the new element at the front of the queue.

Compilation flags:

static

Template:

jump(Element,Queue,NewQueue)

Mode and number of proofs:

jump(@term,+queue,-queue) - zero_or_one

jump_all/3

Adds the new elements at the front of the queue. The last element in the list will be at the front of the queue.

Compilation flags:

static

Template:

```
jump_all(Elements,Queue,NewQueue)
```

Mode and number of proofs:

```
jump_all(+list,+queue,-queue) - zero_or_one
```

```
jump_all_block/3
```

Adds the new elements as a block at the front of the queue. The first element in the list will be at the front of the queue.

Compilation flags:

```
static
```

Template:

```
jump_all_block(Elements,Queue,NewQueue)
```

Mode and number of proofs:

```
jump_all_block(+list,+queue,-queue) - zero_or_one
```

```
append/3
```

Appends two queues. The new queue will have the elements of the first queue followed by the elements of the second queue.

Compilation flags:

```
static
```

Template:

```
append(Queue1,Queue2,NewQueue)
```

Mode and number of proofs:

```
append(+queue,+queue,-queue) - one
```

length/2

Queue length.

Compilation flags:

static

Template:

length(Queue,Length)

Mode and number of proofs:

length(+heap,?integer) - zero_or_one

serve/3

Removes the first element of the queue for service.

Compilation flags:

static

Template:

serve(Queue,Head,NewQueue)

Mode and number of proofs:

serve(+queue,?term,-queue) - zero_or_one

as_list/2

Converts a queue to a list.

Compilation flags:

static

Template:

as_list(Queue,List)

Mode and number of proofs:

as_list(+queue,-list) - one

map/2

Applies a closure to all elements of a queue.

Compilation flags:

static

Template:

map(Closure,Queue)

Meta-predicate template:

map(1,*)

Mode and number of proofs:

map(+callable,+queue) - zero_or_one

map/3

Applies a closure to all elements of a queue constructing a new queue.

Compilation flags:

static

Template:

map(Closure,Queue,NewQueue)

Meta-predicate template:

map(2,*,*)

Mode and number of proofs:

map(+callable,+queue,?queue) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[queue](#)

1.60 random

object

1.60.1 backend_random

Random number generator predicates using the backend Prolog compiler built-in random generator.

Availability:

```
logtalk_load(random(loader))
```

Author: Paulo Moura

Version: 1:20:0

Date: 2023-11-24

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public pseudo_random_protocol
```

Uses:

```
list
```

Remarks:

- **Implementation:** The backend Prolog compiler built-in random generator is only used for the basic `random/1`, `get_seed/1`, and `set_seed/1` predicates.
- **Portability:** B-Prolog, CxProlog, ECLiPSe, JIProlog, Qu-Prolog, and Quintus Prolog do not provide implementations for the `get_seed/1` and `set_seed/1` predicates and calling these predicates simply succeed without performing any action.

Inherited public predicates:

between/3 enumerate/2 get_seed/1 maybe/0 maybe/1 maybe/2 maybe_call/1 maybe_call/2
 member/2 permutation/2 random/1 random/3 randseq/4 randset/4 select/3 select/4
 sequence/4 set/4 set_seed/1 swap/2 swap_consecutive/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

random, fast_random

object

1.60.2 fast_random

Fast portable random number generator predicates. Core predicates originally written by Richard O'Keefe. Based on algorithm AS 183 from Applied Statistics.

Availability:

```
logtalk_load(random(loader))
```

Author: Paulo Moura

Version: 2:11:0

Date: 2023-11-24

Compilation flags:

static, context_switching_calls

Implements:

public pseudo_random_protocol

Uses:

list

Remarks:

- Single random number generator: This object provides a faster version of the random library object but does not support being extended to define multiple random number generators.
- Randomness: Loading this object always initializes the random generator seed to the same value, thus providing a pseudo random number generator. The `randomize/1` predicate can be used to initialize the seed with a random value.

Inherited public predicates:

between/3 enumerate/2 get_seed/1 maybe/0 maybe/1 maybe/2 maybe_call/1 maybe_call/2
member/2 permutation/2 random/1 random/3 randseq/4 randset/4 select/3 select/4
sequence/4 set/4 set_seed/1 swap/2 swap_consecutive/2

- Public predicates
 - reset_seed/0
 - randomize/1
- Protected predicates
- Private predicates
 - seed_/3
- Operators

Public predicates

reset_seed/0

Resets the random generator seed to its default value. Use `get_seed/1` and `set_seed/1` instead if you need reproducibility.

Compilation flags:

static, synchronized

Mode and number of proofs:

reset_seed - one

randomize/1

Randomizes the random generator using a positive integer to compute a new seed. Use of a large integer is recommended. In alternative, when using a small integer argument, discard the first dozen random values.

Compilation flags:

static, synchronized

Template:

randomize(Seed)

Mode and number of proofs:

randomize(+positive_integer) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

seed_/3

Stores the current random generator seed values.

Compilation flags:

dynamic

Template:

seed_(S0,S1,S2)

Mode and number of proofs:

seed_(-integer,-integer,-integer) - one

Operators

(none)

See also:

random, backend_random

protocol

1.60.3 pseudo_random_protocol

Pseudo-random number generator protocol for seed handling predicates. These predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

```
logtalk_load(random(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2021-02-21

Compilation flags:

```
static
```

Extends:

```
public random_protocol
```

Remarks:

(none)

Inherited public predicates:

```
between/3 enumerate/2 maybe/0 maybe/1 maybe/2 maybe_call/1 maybe_call/2 member/2
permutation/2 random/1 random/3 randseq/4 randset/4 select/3 select/4 sequence/4 set/4
swap/2 swap_consecutive/2
```

- Public predicates
 - get_seed/1
 - set_seed/1
- Protected predicates
- Private predicates
- Operators

Public predicates`get_seed/1`

Gets the current random generator seed. Seed should be regarded as an opaque ground term.

Compilation flags:

static, synchronized

Template:

`get_seed(Seed)`

Mode and number of proofs:

`get_seed(-ground) - one`

`set_seed/1`

Sets the random generator seed to a given value returned by calling the `get_seed/1` predicate.

Compilation flags:

static, synchronized

Template:

`set_seed(Seed)`

Mode and number of proofs:

`set_seed(+ground) - one`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`random`, `backend_random`, `fast_random`

object

1.60.4 `random`

Portable random number generator predicates. Core predicates originally written by Richard O’Keefe. Based on algorithm AS 183 from Applied Statistics.

Availability:

```
logtalk_load(random(loader))
```

Author: Paulo Moura

Version: 2:11:0

Date: 2023-11-24

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public pseudo_random_protocol
```

Uses:

```
list
```

Remarks:

- Multiple random number generators: To define multiple random number generators, simply extend this object. The derived objects must send to self the `reset_seed/0` message.
- Randomness: Loading this object always initializes the random generator seed to the same value, thus providing a pseudo random number generator. The `randomize/1` predicate can be used to initialize the seed with a random value.

Inherited public predicates:

```
between/3 enumerate/2 get_seed/1 maybe/0 maybe/1 maybe/2 maybe_call/1 maybe_call/2  
member/2 permutation/2 random/1 random/3 randseq/4 randset/4 select/3 select/4  
sequence/4 set/4 set_seed/1 swap/2 swap_consecutive/2
```

- Public predicates
 - reset_seed/0
 - randomize/1
- Protected predicates
- Private predicates
 - seed_/3
- Operators

Public predicates

reset_seed/0

Resets the random generator seed to its default value. Use get_seed/1 and set_seed/1 instead if you need reproducibility.

Compilation flags:

static, synchronized

Mode and number of proofs:

reset_seed - one

randomize/1

Randomizes the random generator using a positive integer to compute a new seed. Use of a large integer is recommended. In alternative, when using a small integer argument, discard the first dozen random values.

Compilation flags:

static, synchronized

Template:

randomize(Seed)

Mode and number of proofs:

randomize(+positive_integer) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

seed_/3

Stores the current random generator seed values.

Compilation flags:

dynamic

Template:

seed_(S0,S1,S2)

Mode and number of proofs:

seed_(-integer,-integer,-integer) - one

Operators

(none)

See also:

[fast_random](#), [backend_random](#)

[protocol](#)

1.60.5 random_protocol

Random number generator protocol. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

logtalk_load(random(loader))

Author: Paulo Moura

Version: 3:3:0

Date: 2023-11-24

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - random/1
 - between/3
 - member/2
 - select/3
 - select/4
 - swap/2
 - swap_consecutive/2
 - enumerate/2
 - permutation/2
 - sequence/4
 - set/4
 - random/3
 - randseq/4
 - randset/4
 - maybe/0
 - maybe/1
 - maybe/2
 - maybe_call/1
 - maybe_call/2
- Protected predicates
- Private predicates
- Operators

Public predicates

random/1

Returns a new random float value in the interval [0.0, 1.0[.

Compilation flags:

static, synchronized

Template:

random(Random)

Mode and number of proofs:

random(-float) - one

between/3

Returns a new random integer in the interval [Lower, Upper]. Fails if Lower or Upper are not integers or if Lower > Upper.

Compilation flags:

static

Template:

between(Lower,Upper,Random)

Mode and number of proofs:

between(+integer,+integer,-integer) - zero_or_one

member/2

Returns a random member of a list. Fails if the list is empty.

Compilation flags:

static

Template:

member(Random,List)

Mode and number of proofs:

member(-term,+list(term)) - zero_or_one

select/3

Returns a random member of a list and the rest of the list. Fails if the list is empty.

Compilation flags:

static

Template:

select(Random,List,Rest)

Mode and number of proofs:

select(-term,+list(term),-list(term)) - zero_or_one

select/4

Returns a random member of a list, replacing it with a new element and returning the resulting list.

Compilation flags:

static

Template:

select(Random,OldList,New,NewList)

Mode and number of proofs:

select(-term,+list(term),@term,-list(term)) - zero_or_one

swap/2

Swaps two randomly selected elements of a list. Fails if the list is empty or contains a single element.

Compilation flags:

static

Template:

swap(OldList,NewList)

Mode and number of proofs:

swap(-term,+list(term)) - zero_or_one

swap_consecutive/2

Swaps two randomly selected consecutive elements of a list. Fails if the list is empty or contains a single element.

Compilation flags:

static

Template:

swap_consecutive(OldList,NewList)

Mode and number of proofs:

swap_consecutive(-term,+list(term)) - zero_or_one

enumerate/2

Enumerates the elements of a list in random order. Fails if the list is empty.

Compilation flags:

static

Template:

enumerate(List,Random)

Mode and number of proofs:

enumerate(+list(term),--term) - zero_or_more

permutation/2

Returns a random permutation of a list.

Compilation flags:

static, synchronized

Template:

permutation(List,Permutation)

Mode and number of proofs:

permutation(+list,-list) - one

sequence/4

Returns list of random integers of given length in random order in interval [Lower, Upper]. Fails if Length, Lower, or Upper are not integers or if Lower > Upper.

Compilation flags:

static, synchronized

Template:

sequence(Length,Lower,Upper,List)

Mode and number of proofs:

sequence(+integer,+integer,+integer,-list(integer)) - zero_or_one

set/4

Returns ordered set of random integers of given size in interval [Lower, Upper]. Fails if Length, Lower, or Upper are not integers, if Lower > Upper, or if Length > Upper - Lower + 1.

Compilation flags:

static, synchronized

Template:

set(Length,Lower,Upper,Set)

Mode and number of proofs:

set(+integer,+integer,+integer,-list(integer)) - zero_or_one

random/3

Returns a new random value in the interval [Lower, Upper[. Fails if Lower > Upper. Deprecated. Use between/3 for integers.

Compilation flags:

static, synchronized

Template:

random(Lower,Upper,Random)

Mode and number of proofs:

random(+integer,+integer,-integer) - zero_or_one

random(+float,+float,-float) - zero_or_one

randseq/4

Returns list of random values of given length in random order in interval [Lower, Upper[. Fails if Lower > Upper or if the arguments are neither integers or floats. Deprecated. Use sequence/4 for integers.

Compilation flags:

static, synchronized

Template:

randseq(Length,Lower,Upper,List)

Mode and number of proofs:

randseq(+integer,+integer,+integer,-list(integer)) - zero_or_one

randseq(+integer,+float,+float,-list(float)) - zero_or_one

randset/4

Returns ordered set of random values of given size in interval [Lower, Upper[. Fails if the arguments are neither integers or floats, Lower > Upper, or Length > Upper - Lower when arguments are integers. Deprecated. Use set/4 for integers.

Compilation flags:

static, synchronized

Template:

randset(Length,Lower,Upper,Set)

Mode and number of proofs:

randset(+integer,+integer,+integer,-list(integer)) - zero_or_one

randset(+integer,+float,+float,-list(float)) - zero_or_one

maybe/0

Succeeds or fails with equal probability.

Compilation flags:

static

Mode and number of proofs:

maybe - zero_or_one

maybe/1

Succeeds with probability Probability or fails with probability 1 - Probability. Fails if Probability is not a float or is outside the interval [0.0, 1.0].

Compilation flags:

static

Template:

maybe(Probability)

Mode and number of proofs:

maybe(+probability) - zero_or_one

maybe/2

Succeeds with probability K/N where K and N are integers satisfying the equation $0 \leq K \leq N$. Fails otherwise.

Compilation flags:

static

Template:

maybe(K,N)

Mode and number of proofs:

maybe(+non_negative_integer,+non_negative_integer) - zero_or_one

maybe_call/1

Calls a goal or fails without calling it with equal probability. When the goal is called, it determines if this predicate succeeds once or fails.

Compilation flags:

static

Template:

maybe_call(Goal)

Meta-predicate template:

maybe_call(0)

Mode and number of proofs:

maybe_call(+callable) - zero_or_one

`maybe_call/2`

Calls a goal or fails without calling it with probability `Probability`. When the goal is called, it determines if this predicate succeeds once or fails.

Compilation flags:

`static`

Template:

`maybe_call(Probability,Goal)`

Meta-predicate template:

`maybe_call(*,0)`

Mode and number of proofs:

`maybe_call(+probability,+callable) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`random`, `backend_random`, `fast_random`

1.61 reader

object

1.61.1 reader

Predicates for reading text file and text stream contents to lists of terms, characters, or character codes and for reading binary file and binary stream contents to lists of bytes.

Availability:

```
logtalk_load(reader(loader))
```

Author: Paulo Moura

Version: 2:2:0

Date: 2023-11-14

Compilation flags:

```
static, context_switching_calls
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - file_to_codes/2
 - file_to_codes/3
 - file_to_chars/2
 - file_to_chars/3
 - file_to_terms/2
 - file_to_terms/3
 - file_to_bytes/2
 - file_to_bytes/3
 - stream_to_codes/2
 - stream_to_codes/3
 - stream_to_chars/2
 - stream_to_chars/3
 - stream_to_terms/2

- stream_to_terms/3
- stream_to_bytes/2
- stream_to_bytes/3
- line_to_chars/2
- line_to_chars/3
- line_to_codes/2
- line_to_codes/3
- Protected predicates
- Private predicates
- Operators

Public predicates

file_to_codes/2

Reads a text file into a list of character codes.

Compilation flags:

static

Template:

file_to_codes(File,Codes)

Mode and number of proofs:

file_to_codes(+atom,-list(character_code)) - one

file_to_codes/3

Reads a text file into a list of character codes. The list is terminated by the given tail.

Compilation flags:

static

Template:

file_to_codes(File,Codes,Tail)

Mode and number of proofs:

file_to_codes(+atom,-list(character_code),@term) - one

`file_to_chars/2`

Reads a text file into a list of characters.

Compilation flags:

`static`

Template:

`file_to_chars(File,Chars)`

Mode and number of proofs:

`file_to_chars(+atom,-list(character)) - one`

`file_to_chars/3`

Reads a text file into a list of characters. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`file_to_chars(File,Chars,Tail)`

Mode and number of proofs:

`file_to_chars(+atom,-list(character),@term) - one`

`file_to_terms/2`

Reads a text file into a list of terms.

Compilation flags:

`static`

Template:

`file_to_terms(File,Terms)`

Mode and number of proofs:

`file_to_terms(+atom,-list(term))` - one

`file_to_terms/3`

Reads a text file into a list of terms. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`file_to_terms(File,Terms,Tail)`

Mode and number of proofs:

`file_to_terms(+atom,-list(term),@term)` - one

`file_to_bytes/2`

Reads a binary file into a list of bytes.

Compilation flags:

`static`

Template:

`file_to_bytes(File,Bytes)`

Mode and number of proofs:

`file_to_bytes(+atom,-list(byte))` - one

`file_to_bytes/3`

Reads a binary file into a list of bytes. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`file_to_bytes(File,Bytes,Tail)`

Mode and number of proofs:

`file_to_bytes(+atom,-list(byte),@term) - one`

`stream_to_codes/2`

Reads a text stream into a list of character codes. Does not close the stream.

Compilation flags:

`static`

Template:

`stream_to_codes(Stream,Codes)`

Mode and number of proofs:

`stream_to_codes(+stream_or_alias,-list(character_code)) - one`

`stream_to_codes/3`

Reads a text stream into a list of character codes. Does not close the stream. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`stream_to_codes(Stream,Codes,Tail)`

Mode and number of proofs:

`stream_to_codes(+stream_or_alias,-list(character_code),@term) - one`

`stream_to_chars/2`

Reads a text stream into a list of characters. Does not close the stream.

Compilation flags:

`static`

Template:

`stream_to_chars(Stream,Chars)`

Mode and number of proofs:

`stream_to_chars(+stream_or_alias,-list(char)) - one`

`stream_to_chars/3`

Reads a text stream into a list of characters. Does not close the stream. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`stream_to_chars(Stream,Chars,Tail)`

Mode and number of proofs:

`stream_to_chars(+stream_or_alias,-list(char),@term) - one`

`stream_to_terms/2`

Reads a text stream into a list of terms. Does not close the stream.

Compilation flags:

`static`

Template:

`stream_to_terms(Stream,Terms)`

Mode and number of proofs:

`stream_to_terms(+stream_or_alias,-list(term)) - one`

`stream_to_terms/3`

Reads a text stream into a list of terms. Does not close the stream. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`stream_to_terms(Stream, Terms, Tail)`

Mode and number of proofs:

`stream_to_terms(+stream_or_alias, -list(term), @term) - one`

`stream_to_bytes/2`

Reads a binary stream into a list of bytes. Does not close the stream.

Compilation flags:

`static`

Template:

`stream_to_bytes(Stream, Bytes)`

Mode and number of proofs:

`stream_to_bytes(+stream_or_alias, -list(byte)) - one`

`stream_to_bytes/3`

Reads a binary stream into a list of bytes. Does not close the stream. The list is terminated by the given tail.

Compilation flags:

`static`

Template:

`stream_to_bytes(Stream, Bytes, Tail)`

Mode and number of proofs:

`stream_to_bytes(+stream_or_alias,-list(byte),@term) - one`

`line_to_chars/2`

Reads a line from a text stream into a list of characters. Discards the end-of-line characters. Unifies Chars with `end_of_file` at the end of the file.

Compilation flags:

`static`

Template:

`line_to_chars(Stream,Chars)`

Mode and number of proofs:

`line_to_chars(+stream_or_alias,-types([atom,list(character)])) - one`

`line_to_chars/3`

Reads a line from a text stream into a list of characters. Keeps the end-of-line marker normalized to the line feed control character. The list is terminated by the given tail, which is unified with the empty list at the end of the file.

Compilation flags:

`static`

Template:

`line_to_chars(Stream,Chars,Tail)`

Mode and number of proofs:

`line_to_chars(+stream_or_alias,-list(character),?term) - one`

line_to_codes/2

Reads a line from a text stream into a list of character codes. Discards the end-of-line character codes. Unifies Codes with end_of_file at the end of the file.

Compilation flags:

static

Template:

line_to_codes(Stream,Codes)

Mode and number of proofs:

line_to_codes(+stream_or_alias,-types([atom,list(character_code)])) - one

line_to_codes/3

Reads a line from a text stream into a list of character codes. Keeps the end-of-line marker normalized to the line feed control character code. The list is terminated by the given tail, which is unified with the empty list at the end of the file.

Compilation flags:

static

Template:

line_to_codes(Stream,Codes,Tail)

Mode and number of proofs:

line_to_codes(+stream_or_alias,-list(character_code),?term) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.62 recorded_database

object

1.62.1 recorded_database

Legacy recorded database predicates. Provides an application global database.

Availability:

```
logtalk_load(recorded_database(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-12-17

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public recorded_database_core
```

Remarks:

(none)

Inherited public predicates:

```
erase/1 instance/2 recorda/2 recorda/3 recorded/2 recorded/3 recordz/2 recordz/3
```

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.62.2 recorded_database_core

Legacy recorded database predicates. Can be imported into an object to provide a local database.

Availability:

```
logtalk_load(recorded_database(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-12-17

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- References: Opaque ground terms.

Inherited public predicates:

```
(none)
```

- Public predicates
 - recorda/3
 - recorda/2
 - recordz/3
 - recordz/2
 - recorded/3
 - recorded/2
 - erase/1
 - instance/2
- Protected predicates
- Private predicates
 - record_/3
 - reference_/1
- Operators

Public predicates

recorda/3

Adds a term as the first term for the given key, returning its reference.

Compilation flags:

static

Template:

recorda(Key,Term,Reference)

Mode and number of proofs:

recorda(+recorded_database_key,+term,--recorded_database_reference) - one_or_error

Exceptions:

Key is a variable:

instantiation_error

Key is neither a variable nor an atomic term or compound term:

type_error(recorded_database_key,Key)

Reference is a not a variable:

uninstantiation_error(Reference)

recorda/2

Adds a term as the first term for the given key.

Compilation flags:

static

Template:

recorda(Key,Term)

Mode and number of proofs:

recorda(+recorded_database_key,+term) - one_or_error

Exceptions:

Key is a variable:

instantiation_error

Key is neither a variable nor an atomic term or compound term:

type_error(recorded_database_key,Key)

recordz/3

Adds a term as the last term for the given key, returning its reference.

Compilation flags:

static

Template:

recordz(Key,Term,Reference)

Mode and number of proofs:

recordz(+recorded_database_key,+term,--recorded_database_reference) - one_or_error

Exceptions:

Key is a variable:

instantiation_error

Key is neither a variable nor an atomic term or compound term:

type_error(recorded_database_key,Key)

Reference is not a variable:

uninstantiation_error(Reference)

recordz/2

Adds a term as the last term for the given key.

Compilation flags:

static

Template:

recordz(Key,Term)

Mode and number of proofs:

recordz(+recorded_database_key,+term) - one_or_error

Exceptions:

Key is a variable:

instantiation_error

Key is neither a variable nor an atomic term or compound term:

type_error(recorded_database_key,Key)

recorded/3

Enumerates, by backtracking, all record key-term pairs and their references.

Compilation flags:

static

Template:

recorded(Key,Term,Reference)

Mode and number of proofs:

recorded(?recorded_database_key,?term,-recorded_database_reference) - zero_or_more

recorded(?recorded_database_key,?term,+recorded_database_reference) - zero_or_one

recorded/2

Enumerates, by backtracking, all record key-term pairs.

Compilation flags:

static

Template:

recorded(Key,Term)

Mode and number of proofs:

recorded(?recorded_database_key,?term) - zero_or_more

erase/1

Erases the record indexed by the given reference. Fails if there is no record with the given reference.

Compilation flags:

static

Template:

erase(Reference)

Mode and number of proofs:

erase(@recorded_database_reference) - zero_or_one_or_error

Exceptions:

Reference is a variable:

instantiation_error

instance/2

.

Compilation flags:

static

Template:

instance(Reference,Term)

Mode and number of proofs:

instance(@recorded_database_reference,?term) - zero_or_one_or_error

Exceptions:

Reference is a variable:

instantiation_error

Protected predicates

(none)

Private predicates

record_/3

Records table.

Compilation flags:

dynamic

Template:

record_(Key,Term,Reference)

Mode and number of proofs:

record_(?recorded_database_key,?term,?recorded_database_reference) - zero_or_more

reference_/1

Reference count.

Compilation flags:

dynamic

Template:

reference_(Reference)

Mode and number of proofs:

reference_(?non_negative_integer) - zero_or_one

Operators

(none)

1.63 redis

object

1.63.1 redis

Redis client. Inspired by Sean Charles GNU Prolog Redis client.

Availability:

```
logtalk_load(redis(loader))
```

Author: Paulo Moura

Version: 0:5:1

Date: 2021-12-06

Compilation flags:

```
static, context_switching_calls
```

Provides:

```
logtalk::message_tokens//2
```

Uses:

```
list
```

```
logtalk
```

Remarks:

- **Command representation:** Use the Redis command name as the functor of a compound term where the arguments are the command arguments.
- **Valid arguments:** Atoms, integers, and floats. Always use atoms instead of double-quoted “strings”. This helps portability by not depending on the value of the `double_quotes` flag.

Inherited public predicates:

(none)

- Public predicates
 - connect/1
 - connect/3
 - disconnect/1
 - send/3
 - console/1
- Protected predicates
- Private predicates
- Operators

Public predicates

connect/1

Connect to a Redis server running on localhost using the default 6379 port.

Compilation flags:
static

Template:

connect(Connection)

Mode and number of proofs:
connect(--ground) - one

connect/3

Connect to a Redis server running on the given host and port.

Compilation flags:
static

Template:

connect(Host,Port,Connection)

Mode and number of proofs:
connect(+atom,+integer,--ground) - one

disconnect/1

Disconnect from a Redis server.

Compilation flags:

static

Template:

disconnect(Connection)

Mode and number of proofs:

disconnect(++ground) - one

send/3

Sends a request to the a Redis server and returns its reply.

Compilation flags:

static

Template:

send(Connection,Request,Reply)

Mode and number of proofs:

send(++ground,++callable,--callable) - one

console/1

Sends a request to a Redis server running on localhost at the default 6379 port and prints the reply.

Compilation flags:

static

Template:

console(Request)

Mode and number of proofs:

console(++callable) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.64 sets

object

1.64.1 set

Set predicates implemented using ordered lists. Uses `==/2` for element comparison and standard term ordering.

Availability:

```
logtalk_load(sets(loader))
```

Author: Richard O'Keefe (main predicates); adapted to Logtalk by Paulo Moura.

Version: 1:12:0

Date: 2019-05-23

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public setp
```

Extends:

```
public compound
```

Aliases:

```
setp size/2 as length/2
```

Remarks:

```
(none)
```

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 as_list/2 as_set/2 check/1 delete/3 depth/2 disjoint/2 empty/1 equal/2 ground/1 insert/3 insert_all/3 intersect/2 intersection/3 intersection/4 member/2 memberchk/2 new/1 numbervars/1 numbervars/3 occurs/2 powerset/2 product/3 select/3 selectchk/3 singletons/2 size/2 subset/2 subsumes/2 subterm/2 subtract/3 symdiff/3 union/3 union/4 valid/1 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

set(Type)

object

1.64.2 set(Type)

Set predicates with elements constrained to a single type and custom comparing rules.

Availability:

logtalk_load(sets(loader))

Author: Paulo Moura and Adrian Arroyo

Version: 1:24:0

Date: 2022-02-03

Compilation flags:

static, context_switching_calls

Extends:

public set

Uses:

list

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 as_list/2 as_set/2 check/1 delete/3 depth/2 disjoint/2 empty/1 equal/2 ground/1 insert/3 insert_all/3 intersect/2 intersection/3 intersection/4 member/2 memberchk/2 new/1 numbervars/1 numbervars/3 occurs/2 powerset/2 product/3 select/3 selectchk/3 singletons/2 size/2 subset/2 subsumes/2 subterm/2 subtract/3 symdiff/3 union/3 union/4 valid/1 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
 - sort/2
 - partition/4
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

sort/2

Sorts a list in ascending order.

Compilation flags:

static

Template:

sort(List,Sorted)

Mode and number of proofs:

sort(+list,-list) - one

partition/4

List partition in two sub-lists using a pivot.

Compilation flags:

static

Template:

partition(List,Pivot,Lowes,Biggers)

Mode and number of proofs:

partition(+list,+nonvar,-list,-list) - one

Operators

(none)

protocol

1.64.3 setp

Set protocol.

Availability:

```
logtalk_load(sets(loader))
```

Author: Paulo Moura

Version: 1:6:0

Date: 2019-05-23

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - as_set/2
 - as_list/2
 - delete/3
 - disjoint/2
 - equal/2
 - empty/1
 - insert/3
 - insert_all/3
 - intersect/2
 - intersection/3
 - intersection/4
 - size/2
 - member/2

- memberchk/2
- powerset/2
- product/3
- select/3
- selectchk/3
- subset/2
- subtract/3
- symdiff/3
- union/3
- union/4
- Protected predicates
- Private predicates
- Operators

Public predicates

`as_set/2`

Returns a set with all unique elements from the given list.

Compilation flags:

`static`

Template:

`as_set(List,Set)`

Mode and number of proofs:

`as_set(@list,-set) - one`

`as_list/2`

Returns a list with all elements of the given set.

Compilation flags:

`static`

Template:

`as_list(Set,List)`

Mode and number of proofs:

`as_list(@set,-list) - one`

`delete/3`

Deletes an element from a set returning the set of remaining elements.

Compilation flags:

`static`

Template:

`delete(Set,Element,Remaining)`

Mode and number of proofs:

`delete(+set,@term,?set) - one`

`disjoint/2`

True if the two sets have no element in common.

Compilation flags:

`static`

Template:

`disjoint(Set1,Set2)`

Mode and number of proofs:

`disjoint(+set,+set) - zero_or_one`

equal/2

True if the two sets are equal.

Compilation flags:

static

Template:

equal(Set1,Set2)

Mode and number of proofs:

equal(+set,+set) - zero_or_one

empty/1

True if the set is empty.

Compilation flags:

static

Template:

empty(Set)

Mode and number of proofs:

empty(+set) - zero_or_one

insert/3

Inserts an element in a set, returning the resulting set.

Compilation flags:

static

Template:

insert(In,Element,Out)

Mode and number of proofs:

insert(+set,+term,?set) - one

`insert_all/3`

Inserts a list of elements in a set, returning the resulting set.

Compilation flags:

`static`

Template:

`insert_all(List,In,Out)`

Mode and number of proofs:

`insert_all(+list,+set,?set) - one`

`intersect/2`

True if the two sets have at least one element in common.

Compilation flags:

`static`

Template:

`intersect(Set1,Set2)`

Mode and number of proofs:

`intersect(+set,+set) - zero_or_one`

`intersection/3`

Returns the intersection of Set1 and Set2.

Compilation flags:

`static`

Template:

`intersection(Set1,Set2,Intersection)`

Mode and number of proofs:

`intersection(+set,+set,?set) - zero_or_one`

intersection/4

True if Intersection is the intersection of Set1 and Set2 and Difference is the difference between Set2 and Set1.

Compilation flags:

static

Template:

intersection(Set1,Set2,Intersection,Difference)

Mode and number of proofs:

intersection(+set,+set,?set,?set) - zero_or_one

size/2

Number of set elements.

Compilation flags:

static

Template:

size(Set,Size)

Mode and number of proofs:

size(+set,?integer) - zero_or_one

member/2

Element is a member of set Set.

Compilation flags:

static

Template:

member(Element,Set)

Mode and number of proofs:

member(+term,+set) - zero_or_one

member(-term,+set) - zero_or_more

memberchk/2

Checks if a term is a member of a set.

Compilation flags:

static

Template:

memberchk(Element,Set)

Mode and number of proofs:

memberchk(+term,+set) - zero_or_one

powerset/2

Returns the power set of a set, represented as a list of sets.

Compilation flags:

static

Template:

powerset(Set,PowerSet)

Mode and number of proofs:

powerset(+set,-list) - one

product/3

Returns the cartesian product of two sets.

Compilation flags:

static

Template:

product(Set1,Set2,Product)

Mode and number of proofs:

product(+set,+set,-set) - one

select/3

Selects an element from a set, returning the set of remaining elements.

Compilation flags:

static

Template:

select(Element,Set,Remaining)

Mode and number of proofs:

select(?term,+set,?set) - zero_or_more

selectchk/3

Checks that an element can be selected from a set, returning the set of remaining elements.

Compilation flags:

static

Template:

selectchk(Element,Set,Remaining)

Mode and number of proofs:

selectchk(?term,+set,?set) - zero_or_one

subset/2

True if Subset is a subset of Set.

Compilation flags:

static

Template:

subset(Subset,Set)

Mode and number of proofs:

subset(+set,+set) - zero_or_one

subtract/3

True when Difference contains all and only the elements of Set1 which are not also in Set2.

Compilation flags:

static

Template:

subtract(Set1,Set2,Difference)

Mode and number of proofs:

subtract(+set,+set,?set) - zero_or_one

symdiff/3

True if Difference is the symmetric difference of Set1 and Set2, containing all elements that are not in the sets intersection.

Compilation flags:

static

Template:

symdiff(Set1,Set2,Difference)

Mode and number of proofs:

symdiff(+set,+set,?set) - zero_or_one

union/3

True if Union is the union of Set1 and Set2.

Compilation flags:

static

Template:

union(Set1,Set2,Union)

Mode and number of proofs:

union(+set,+set,?set) - zero_or_one

union/4

True if Union is the union of Set1 and Set2 and Difference is the difference between Set2 and Set1.

Compilation flags:

static

Template:

union(Set1,Set2,Union,Difference)

Mode and number of proofs:

union(+set,+set,?set,?set) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

set, set(Type)

1.65 statistics

object

1.65.1 population

Statistical population represented as a list of numbers.

Availability:

logtalk_load(statistics(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2020-02-02

Compilation flags:

static, context_switching_calls

Imports:

public statistics

Remarks:

(none)

Inherited public predicates:

arithmetic_mean/2 average_deviation/3 coefficient_of_variation/2 fractile/3 geometric_mean/2
harmonic_mean/2 kurtosis/2 max/2 mean_deviation/2 median/2 median_deviation/2 min/2
min_max/3 modes/2 product/2 range/2 relative_standard_deviation/2 skewness/2
standard_deviation/2 sum/2 valid/1 variance/2 weighted_mean/3 z_normalization/2

- Public predicates
- Protected predicates
- Private predicates

- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[sample](#)

object

1.65.2 [sample](#)

Statistical sample represented as a list of numbers.

Availability:

`logtalk_load(statistics(loader))`

Author: Paulo Moura

Version: 1:4:0

Date: 2020-02-02

Compilation flags:

`static, context_switching_calls`

Imports:

`public statistics`

Remarks:

(none)

Inherited public predicates:

arithmetic_mean/2 average_deviation/3 coefficient_of_variation/2 fractile/3 geometric_mean/2
 harmonic_mean/2 kurtosis/2 max/2 mean_deviation/2 median/2 median_deviation/2 min/2
 min_max/3 modes/2 product/2 range/2 relative_standard_deviation/2 skewness/2
 standard_deviation/2 sum/2 valid/1 variance/2 weighted_mean/3 z_normalization/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

population

category

1.65.3 statistics

Statistical calculations over a list of numbers.

Availability:

```
logtalk_load(statistics(loader))
```

Author: Paulo Moura

Version: 1:7:1

Date: 2023-05-29

Compilation flags:

static

Implements:

public statisticsp

Uses:

list

numberlist

Remarks:

(none)

Inherited public predicates:

arithmetic_mean/2 average_deviation/3 coefficient_of_variation/2 fractile/3 geometric_mean/2
harmonic_mean/2 kurtosis/2 max/2 mean_deviation/2 median/2 median_deviation/2 min/2
min_max/3 modes/2 product/2 range/2 relative_standard_deviation/2 skewness/2
standard_deviation/2 sum/2 valid/1 variance/2 weighted_mean/3 z_normalization/2

- Public predicates
- Protected predicates
- Private predicates
 - arithmetic_mean/5
 - squares_and_cubes/6
 - squares_and_hypers/6
 - variance/6
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

arithmetic_mean/5

Auxiliary predicate for computing the arithmetic mean.

Compilation flags:

static

Template:

arithmetic_mean(List,Length0,Length,Sum,Mean)

Mode and number of proofs:

arithmetic_mean(+list(number),+integer,-integer,+number,-float) - one

squares_and_cubes/6

Auxiliary predicate for computing the skewness.

Compilation flags:

static

Template:

squares_and_cubes(List,Mean,Squares0,Squares,Cubes0,Cubes)

Mode and number of proofs:

squares_and_cubes(+list(number),+float,+float,-float,+float,-float) - one

squares_and_hypers/6

Auxiliary predicate for computing the kurtosis.

Compilation flags:

static

Template:

squares_and_hypers(List,Mean,Squares0,Squares,Hypers0,Hypers)

Mode and number of proofs:

squares_and_hypers(+list(number),+float,+float,-float,+float,-float) - one

variance/6

Auxiliary predicate for computing the variance.

Compilation flags:

static

Template:

variance(List,Length0,Length,Mean,M20,M2)

Mode and number of proofs:

variance(+list(number),+integer,-integer,+float,+float,-float) - one

Operators

(none)

protocol

1.65.4 statisticsp

Statistical calculations over a list of numbers protocol.

Availability:

logtalk_load(statistics(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2022-06-20

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - product/2
 - sum/2
 - min/2
 - max/2
 - min_max/3
 - range/2
 - arithmetic_mean/2
 - geometric_mean/2
 - harmonic_mean/2
 - weighted_mean/3
 - median/2
 - modes/2
 - average_deviation/3
 - mean_deviation/2
 - median_deviation/2
 - standard_deviation/2
 - coefficient_of_variation/2
 - relative_standard_deviation/2
 - skewness/2
 - kurtosis/2
 - variance/2
 - z_normalization/2
 - fractile/3
 - valid/1
- Protected predicates
- Private predicates
- Operators

Public predicates

product/2

Calculates the product of all list numbers. Fails if the list is empty.

Compilation flags:

static

Template:

product(List,Product)

Mode and number of proofs:

product(+list(number),-number) - zero_or_one

sum/2

Calculates the sum of all list numbers. Fails if the list is empty.

Compilation flags:

static

Template:

sum(List,Sum)

Mode and number of proofs:

sum(+list(number),-number) - zero_or_one

min/2

Determines the minimum value in a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

min(List,Minimum)

Mode and number of proofs:

min(+list,-number) - zero_or_one

max/2

Determines the list maximum value in a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

max(List,Maximum)

Mode and number of proofs:

max(+list,-number) - zero_or_one

min_max/3

Determines the minimum and maximum values in a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

min_max(List,Minimum,Maximum)

Mode and number of proofs:

min_max(+list(number),-number,-number) - zero_or_one

range/2

Range is the length of the smallest interval which contains all the numbers in List. Fails if the list is empty.

Compilation flags:

static

Template:

range(List,Range)

Mode and number of proofs:

`range(+list,-number) - zero_or_one`

`arithmetic_mean/2`

Calculates the arithmetic mean of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

`arithmetic_mean(List,Mean)`

Mode and number of proofs:

`arithmetic_mean(+list(number),-float) - zero_or_one`

`geometric_mean/2`

Calculates the geometric mean of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

`geometric_mean(List,Mean)`

Mode and number of proofs:

`geometric_mean(+list(number),-float) - zero_or_one`

`harmonic_mean/2`

Calculates the harmonic mean of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

harmonic_mean(List,Mean)

Mode and number of proofs:

harmonic_mean(+list(number),-float) - zero_or_one

weighted_mean/3

Calculates the weighted mean of a list of numbers. Fails if the list is empty or if the two lists have different lengths. Wights are assume to be non-negative.

Compilation flags:

static

Template:

weighted_mean(Weights,List,Mean)

Mode and number of proofs:

weighted_mean(+list(number),+list(number),-float) - zero_or_one

median/2

Calculates the median of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

median(List,Median)

Mode and number of proofs:

median(+list(number),-float) - zero_or_one

modes/2

Returns the list of modes of a list of numbers in ascending order. Fails if the list is empty.

Compilation flags:

static

Template:

modes(List,Modes)

Mode and number of proofs:

modes(+list(number),-list(number)) - zero_or_one

average_deviation/3

Calculates the average absolute deviation of a list of numbers given a central tendency (e.g., mean, median, or mode). Fails if the list is empty.

Compilation flags:

static

Template:

average_deviation(List,CentralTendency,Deviation)

Mode and number of proofs:

average_deviation(+list(number),+float,-float) - zero_or_one

mean_deviation/2

Calculates the mean absolute deviation of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

mean_deviation(List,Deviation)

Mode and number of proofs:

mean_deviation(+list(number),-float) - zero_or_one

median_deviation/2

Calculates the median absolute deviation of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

median_deviation(List,Deviation)

Mode and number of proofs:

median_deviation(+list(number),-float) - zero_or_one

standard_deviation/2

Calculates the standard deviation of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

standard_deviation(List,Deviation)

Mode and number of proofs:

standard_deviation(+list(number),-float) - zero_or_one

coefficient_of_variation/2

Calculates the coefficient of variation of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

coefficient_of_variation(List,Coefficient)

Mode and number of proofs:

`coefficient_of_variation(+list(number),-float) - zero_or_one`

`relative_standard_deviation/2`

Calculates the relative standard deviation of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

`relative_standard_deviation(List,Percentage)`

Mode and number of proofs:

`relative_standard_deviation(+list(number),-float) - zero_or_one`

`skewness/2`

Calculates the (moment) skewness of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

`skewness(List,Skewness)`

Mode and number of proofs:

`skewness(+list(number),-float) - zero_or_one`

`kurtosis/2`

Calculates the (excess) kurtosis of a list of numbers. Fails if the list is empty.

Compilation flags:

`static`

Template:

kurtosis(List,Kurtosis)

Mode and number of proofs:

kurtosis(+list(number),-float) - zero_or_one

variance/2

Calculates the unbiased variance of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

variance(List,Variance)

Mode and number of proofs:

variance(+list(number),-float) - zero_or_one

z_normalization/2

Normalizes a list of number such that for the resulting list the mean of is close to zero and the standard deviation is close to 1. Fails if the list is empty.

Compilation flags:

static

Template:

z_normalization(List,NormalizedList)

Mode and number of proofs:

z_normalization(+list(number),-list(float)) - zero_or_one

fractile/3

Calculates the smallest value in a list of numbers such that the list elements in its fraction P are less or equal to that value (with P in the open interval (0.0, 1.0)). Fails if the list is empty.

Compilation flags:

static

Template:

fractile(P,List,Fractile)

Mode and number of proofs:

fractile(+float,+list(integer),-integer) - zero_or_one

fractile(+float,+list(float),-float) - zero_or_one

valid/1

Term is a closed list of numbers.

Compilation flags:

static

Template:

valid(Term)

Mode and number of proofs:

valid(@nonvar) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

statistics, sample, population

1.66 term_io

object

1.66.1 term_io

Term input/output from/to atom, chars, and codes.

Availability:

```
logtalk_load(term_io(loader))
```

Author: Paulo Moura

Version: 1:3:0

Date: 2023-11-14

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public term_io_protocol
```

Uses:

```
os
```

Remarks:

(none)

Inherited public predicates:

```
format_to_atom/3 format_to_chars/3 format_to_chars/4 format_to_codes/3  
format_to_codes/4 read_from_atom/2 read_from_chars/2 read_from_codes/2  
read_term_from_atom/3 read_term_from_chars/3 read_term_from_chars/4  
read_term_from_codes/3 read_term_from_codes/4 with_output_to/2 write_term_to_atom/3  
write_term_to_chars/3 write_term_to_chars/4 write_term_to_codes/3  
write_term_to_codes/4 write_to_atom/2 write_to_chars/2 write_to_codes/2
```

- Public predicates
- Protected predicates
- Private predicates
 - temporary_file_/1
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

temporary_file_/1

Logtalk session and term_io specific temporary file path.

Compilation flags:

dynamic

Template:

temporary_file_(Path)

Mode and number of proofs:

temporary_file_(-atom) - one

Operators

(none)

protocol

1.66.2 term_io_protocol

Predicates for term input/output from/to atom, chars, and codes. The predicates are declared as synchronized when the library is compiled using a backend supporting threads.

Availability:

```
logtalk_load(term_io(loader))
```

Author: Paulo Moura

Version: 1:3:0

Date: 2021-10-04

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- Portability notes: To keep calls to these library predicates portable, use only standard read/write options and specify output formats using atoms.

Inherited public predicates:

```
(none)
```

- Public predicates
 - read_term_from_atom/3
 - read_from_atom/2
 - read_term_from_chars/3
 - read_term_from_chars/4
 - read_from_chars/2
 - read_term_from_codes/3
 - read_term_from_codes/4
 - read_from_codes/2
 - write_term_to_atom/3
 - write_to_atom/2
 - write_term_to_chars/3

- write_term_to_chars/4
 - write_to_chars/2
 - write_term_to_codes/3
 - write_term_to_codes/4
 - write_to_codes/2
 - format_to_atom/3
 - format_to_chars/3
 - format_to_chars/4
 - format_to_codes/3
 - format_to_codes/4
 - with_output_to/2
- Protected predicates
 - Private predicates
 - Operators

Public predicates

read_term_from_atom/3

Reads a term from an atom using the given read options. A period at the end of the atom is optional. Valid options are those supported by the standard read_term/3 predicate.

Compilation flags:

static, synchronized

Template:

read_term_from_atom(Atom,Term,Options)

Mode and number of proofs:

read_term_from_atom(+atom,-term,+list(read_option)) - one_or_error

read_from_atom/2

Reads a term from an atom using default read options. Shorthand for read_term_from_atom(Atom,Term, []). A period at the end of the atom is optional.

Compilation flags:

static

Template:

read_from_atom(Atom,Term)

Mode and number of proofs:

read_from_atom(+atom,-term) - one_or_error

read_term_from_chars/3

Reads a term from a list of characters using the given read options. A period at the end of the list is optional. Valid options are those supported by the standard read_term/3 predicate.

Compilation flags:

static, synchronized

Template:

read_term_from_chars(Chars,Term,Options)

Mode and number of proofs:

read_term_from_chars(+list(character),-term,+list(read_option)) - one_or_error

read_term_from_chars/4

Reads a term from a list of characters using the given read options, also returning the remaining characters. A period at the end of the term is required. Valid options are those supported by the standard read_term/3 predicate.

Compilation flags:

static

Template:

read_term_from_chars(Chars,Term,Tail,Options)

Mode and number of proofs:

`read_term_from_chars(+list(character),-term,-list(character),+list(read_option)) - one_or_error`

`read_from_chars/2`

Reads a term from a list of characters using default read options. Shorthand for `read_term_from_chars(Chars,Term,[])`. A period at the end of the list is optional.

Compilation flags:

`static`

Template:

`read_from_chars(Chars,Term)`

Mode and number of proofs:

`read_from_chars(+list(character),-term) - one_or_error`

`read_term_from_codes/3`

Reads a term from a list of character codes using the given read options. A period at the end of the list is optional. Valid options are those supported by the standard `read_term/3` predicate.

Compilation flags:

`static, synchronized`

Template:

`read_term_from_codes(Codes,Term,Options)`

Mode and number of proofs:

`read_term_from_codes(+list(character_code),-term,+list(read_option)) - one_or_error`

`read_term_from_codes/4`

Reads a term from a list of character codes using the given read options, also returning the remaining character codes. A period at the end of the term is required. Valid options are those supported by the standard `read_term/3` predicate.

Compilation flags:

`static`

Template:

`read_term_from_codes(Codes,Term,Tail,Options)`

Mode and number of proofs:

`read_term_from_codes(+list(character_code),-term,-list(character_code),+list(read_option)) - one_or_error`

`read_from_codes/2`

Reads a term from a list of character codes using default read options. Shorthand for `read_term_from_codes(Codes,Term,[])`. A period at the end of the list is optional.

Compilation flags:

`static`

Template:

`read_from_codes(Codes,Term)`

Mode and number of proofs:

`read_from_codes(+list(character_code),-term) - one_or_error`

`write_term_to_atom/3`

Writes a term to an atom using the given write options. Valid options are those supported by the standard `write_term/3` predicate.

Compilation flags:

`static, synchronized`

Template:

`write_term_to_atom(Term,Atom,Options)`

Mode and number of proofs:

`write_term_to_atom(@term,-atom,+list(write_option)) - one`

`write_to_atom/2`

Writes a term to an atom using default write options. Shorthand for `write_term_to_atom(Term,Atom,[])`.

Compilation flags:

`static`

Template:

`write_to_atom(Term,Atom)`

Mode and number of proofs:

`write_to_atom(@term,-atom) - one`

`write_term_to_chars/3`

Writes a term to a list of characters using the given write options. Shorthand for `write_term_to_chars(Term,Chars,[],Options)`. Valid options are those supported by the standard `write_term/3` predicate.

Compilation flags:

`static`

Template:

`write_term_to_chars(Term,Chars,Options)`

Mode and number of proofs:

`write_term_to_chars(@term,-list(character),+list(write_option)) - one`

`write_term_to_chars/4`

Writes a term to a list of characters with the given tail using the given write options. Valid options are those supported by the standard `write_term/3` predicate.

Compilation flags:

static, synchronized

Template:

`write_term_to_chars(Term,Chars,Tail,Options)`

Mode and number of proofs:

`write_term_to_chars(@term,-list(character),@term,+list(write_option)) - one`

`write_to_chars/2`

Writes a term to a list of characters using default write options. Shorthand for `write_term_to_chars(Term,Chars,[],[])`.

Compilation flags:

static

Template:

`write_to_chars(Term,Chars)`

Mode and number of proofs:

`write_to_chars(@term,-list(character)) - one`

`write_term_to_codes/3`

Writes a term to a list of character codes using the given write options. Shorthand for `write_term_to_codes(Term,Codes,[],Options)`. Valid options are those supported by the standard `write_term/3` predicate.

Compilation flags:

static

Template:

`write_term_to_codes(Term,Codes,Options)`

Mode and number of proofs:

```
write_term_to_codes(@term,-list(character_code),+list(write_option)) - one
```

`write_term_to_codes/4`

Writes a term to a list of character codes with the given tail using the given write options. Valid options are those supported by the standard `write_term/3` predicate.

Compilation flags:

```
static, synchronized
```

Template:

```
write_term_to_codes(Term,Codes,Tail,Options)
```

Mode and number of proofs:

```
write_term_to_codes(@term,-list(character_code),@term,+list(write_option)) - one
```

`write_to_codes/2`

Writes a term to a list of character codes using default write options. Shorthand for `write_term_to_chars(Term,Codes,[],[])`.

Compilation flags:

```
static
```

Template:

```
write_to_codes(Term,Codes)
```

Mode and number of proofs:

```
write_to_codes(@term,-list(character_code)) - one
```

`format_to_atom/3`

Writes a list of arguments to an atom using the given format (specified as in the de facto standard `format/2` predicate).

Compilation flags:

static, synchronized

Template:

`format_to_atom(Format,Arguments,Atom)`

Mode and number of proofs:

`format_to_atom(@atom,+list(term),-atom) - one`

`format_to_chars/3`

Writes a list of arguments to a list of characters using the given format (specified as in the de facto standard `format/2` predicate). Shorthand for `format_to_chars(Format,Arguments,Chars,[])`.

Compilation flags:

static

Template:

`format_to_chars(Format,Arguments,Chars)`

Mode and number of proofs:

`format_to_chars(@term,+list(term),-list(character)) - one`

`format_to_chars/4`

Writes a term to a list of characters with the given tail using the given format (specified as in the de facto standard `format/2` predicate).

Compilation flags:

static, synchronized

Template:

`format_to_chars(Format,Arguments,Chars,Tail)`

Mode and number of proofs:

`format_to_chars(@term,+list(term),-list(character),@term) - one`

`format_to_codes/3`

Writes a list of arguments to a list of character codes using the given format (specified as in the de facto standard `format/2` predicate). Shorthand for `format_to_codes(Format,Arguments,Codes,[])`.

Compilation flags:

`static`

Template:

`format_to_codes(Format,Arguments,Codes)`

Mode and number of proofs:

`format_to_codes(@term,+list(term),-list(character_code)) - one`

`format_to_codes/4`

Writes a list of arguments to a list of character codes with the given tail using the given format (specified as in the de facto standard `format/2` predicate).

Compilation flags:

`static, synchronized`

Template:

`format_to_codes(Format,Arguments,Codes,Tail)`

Mode and number of proofs:

`format_to_codes(@term,+list(term),-list(character_code),@term) - one`

`with_output_to/2`

Calls a goal deterministically with output to the given format: `atom(Atom)`, `chars(Chars)`, `chars(Chars,Tail)`, `codes(Codes)`, or `codes(Codes,Tail)`.

Compilation flags:

`static`, `synchronized`

Template:

`with_output_to(Output,Goal)`

Meta-predicate template:

`with_output_to(*,0)`

Mode and number of proofs:

`with_output_to(+compound,+callable) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.67 timeout

object

1.67.1 timeout

Predicates for calling goal with a time limit.

Availability:

`logtalk_load(timeout(loader))`

Author: Paulo Moura

Version: 0:10:0

Date: 2022-06-15

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

- Supported backend Prolog systems: B-Prolog, ECLiPSe, XVM, SICStus Prolog, SWI-Prolog, Trealla Prolog, XSB, and YAP.

Inherited public predicates:

(none)

- Public predicates
 - call_with_timeout/2
 - call_with_timeout/3
- Protected predicates
- Private predicates
- Operators

Public predicates

call_with_timeout/2

Calls a goal deterministically with the given time limit (expressed in seconds). Note that the goal may fail or throw an error before exhausting the time limit.

Compilation flags:

static

Template:

call_with_timeout(Goal,Timeout)

Meta-predicate template:

call_with_timeout(0,*)

Mode and number of proofs:

call_with_timeout(+callable,+positive_number) - zero_or_one

Exceptions:

Goal does not complete in the allowed time:
 timeout(Goal)

call_with_timeout/3

Calls a goal deterministically with the given time limit (expressed in seconds) returning a reified result: true, fail, timeout, or error(Error).

Compilation flags:

 static

Template:

 call_with_timeout(Goal,Timeout,Result)

Meta-predicate template:

 call_with_timeout(0,*,*)

Mode and number of proofs:

 call_with_timeout(+callable,+positive_number,--atom) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.68 toychr

object

1.68.1 toychrdb

Simple CHR interpreter/debugger based on the refined operational semantics of CHRs.

Availability:

```
logtalk_load(toychr(loader))
```

Author: Gregory J. Duck; adapted to Logtalk by Paulo Moura.

Version: 0:7:1

Date: 2024-03-15

Copyright: Copyright 2004 Gregory J. Duck; Copyright 2019-2024 Paulo Moura

License: GPL-2.0-or-later

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Uses:

```
list
```

```
user
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
 - chr_is/2
 - chr_trace/0
 - chr_notrace/0
 - chr_spy/1
 - chr_nospy/0
 - chr_no_spy/1
 - chr_option/2
- Protected predicates

- current_prog/1
- chr_option_print_trace/0
- chr_option_trace_interactive/0
- chr_option_optimization_level/1
- chr_option_show_stack/0
- chr_option_show_store/0
- chr_option_show_history/0
- chr_option_show_id/0
- chr_option_allow_deep_guards/0
- chr_next_state/1
- chr_spy_point/1
- Private predicates
 - chr_rule_/1
- Operators

Public predicates

chr_is/2

Compilation flags:
static

chr_trace/0

Compilation flags:
static

chr_notrace/0

Compilation flags:
static

chr_spy/1

Compilation flags:
static

chr_nospy/0

Compilation flags:
static

chr_no_spy/1

Compilation flags:
static

chr_option/2

Compilation flags:
static

Protected predicates

current_prog/1

Compilation flags:
static

chr_option_print_trace/0

Compilation flags:
dynamic

chr_option_trace_interactive/0

Compilation flags:
dynamic

chr_option_optimization_level/1

Compilation flags:
dynamic

chr_option_show_stack/0

Compilation flags:
dynamic

chr_option_show_store/0

Compilation flags:
dynamic

chr_option_show_history/0

Compilation flags:
dynamic

chr_option_show_id/0

Compilation flags:
dynamic

chr_option_allow_deep_guards/0

Compilation flags:
dynamic

chr_next_state/1

Compilation flags:
dynamic

chr_spy_point/1

Compilation flags:
dynamic

Private predicates

chr_rule_/1

Compilation flags:
dynamic

Operators

(none)

1.69 tsv

object

1.69.1 tsv

TSV files reading and writing predicates using the option Header-keep.

Availability:
logtalk_load(tsv(loader))

Author: Paulo Moura
Version: 1:0:0
Date: 2023-11-15

Compilation flags:
static, context_switching_calls

Extends:
public tsv(keep)

Remarks:
(none)

Inherited public predicates:
read_file/2 read_file/3 read_file_by_line/2 read_file_by_line/3 read_stream/2
read_stream/3 read_stream_by_line/2 read_stream_by_line/3 write_file/3 write_stream/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.69.2 tsv(Header)

- Header - Header handling option with possible values skip and keep (default).

TSV file and stream reading and writing predicates.

Availability:

```
logtalk_load(tsv(loader))
```

Author: Paulo Moura

Version: 1:0:1

Date: 2024-03-11

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public tsv_protocol
```

Uses:

list
logtalk
reader
type

Remarks:

(none)

Inherited public predicates:

read_file/2 read_file/3 read_file_by_line/2 read_file_by_line/3 read_stream/2
read_stream/3 read_stream_by_line/2 read_stream_by_line/3 write_file/3 write_stream/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.69.3 tsv_protocol

TSV file and stream reading and writing protocol.

Availability:

```
logtalk_load(tsv(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-11-15

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

- Type-checking: Some of the predicate file and stream argument type-checking exceptions depend on the Prolog backend compliance with standards.

Inherited public predicates:

```
(none)
```

- Public predicates
 - read_file/3
 - read_stream/3
 - read_file/2
 - read_stream/2
 - read_file_by_line/3
 - read_stream_by_line/3
 - read_file_by_line/2
 - read_stream_by_line/2
 - write_file/3
 - write_stream/3
- Protected predicates
- Private predicates

- Operators

Public predicates

read_file/3

Reads a TSV file saving the data as clauses for the specified object predicate. Fails if the file cannot be parsed.

Compilation flags:

static

Template:

read_file(File, Object, Predicate)

Mode and number of proofs:

read_file(+atom, +object_identifier, +predicate_indicator) - zero_or_one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom, File)

File is an atom but not an existing file:

existence_error(file, File)

File is an existing file but cannot be opened for reading:

permission_error(open, source_sink, File)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier, Object)

Object is a valid object identifier but not an existing object:

existence_error(object, Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator, Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate, Predicate)

read_stream/3

Reads a TSV stream saving the data as clauses for the specified object predicate. Fails if the stream cannot be parsed.

Compilation flags:

static

Template:

read_stream(Stream, Object, Predicate)

Mode and number of proofs:

read_stream(+stream_or_alias, +object_identifier, +predicate_indicator) - zero_or_one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias, Stream)

Stream is not an open stream:

existence_error(stream, Stream)

Stream is an output stream:

permission_error(input, stream, Stream)

Stream is a binary stream:

permission_error(input, binary_stream, Stream)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier, Object)

Object is a valid object identifier but not an existing object:

existence_error(object, Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator, Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate, Predicate)

read_file/2

Reads a TSV file returning the data as a list of rows, each row a list of fields. Fails if the file cannot be parsed.

Compilation flags:

static

Template:

read_file(File,Rows)

Mode and number of proofs:

read_file(+atom,-list(list)) - zero_or_one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)

File is an existing file but cannot be opened for reading:

permission_error(open,source_sink,File)

read_stream/2

Reads a TSV stream returning the data as a list of rows, each row a list of fields. Fails if the stream cannot be parsed.

Compilation flags:

static

Template:

read_stream(Stream,Rows)

Mode and number of proofs:

read_stream(+stream_or_alias,-list(list)) - zero_or_one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias,Stream)
Stream is not an open stream:
existence_error(stream,Stream)
Stream is an output stream:
permission_error(input,stream,Stream)
Stream is a binary stream:
permission_error(input,binary_stream,Stream)

read_file_by_line/3

Reads a TSV file saving the data as clauses for the specified object predicate. The file is read line by line. Fails if the file cannot be parsed.

Compilation flags:
static

Template:

read_file_by_line(File,Object,Predicate)

Mode and number of proofs:

read_file_by_line(+atom,+object_identifier,+predicate_indicator) - zero_or_one

Exceptions:

File is a variable:

instantiation_error

File is neither a variable nor an atom:

type_error(atom,File)

File is an atom but not an existing file:

existence_error(file,File)

File is an existing file but cannot be opened for reading:

permission_error(open,source_sink,File)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier,Object)

Object is a valid object identifier but not an existing object:

existence_error(object,Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator,Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate,Predicate)

`read_stream_by_line/3`

Reads a TSV stream saving the data as clauses for the specified object predicate. The stream is read line by line. Fails if the stream cannot be parsed.

Compilation flags:

`static`

Template:

`read_stream_by_line(Stream, Object, Predicate)`

Mode and number of proofs:

`read_stream_by_line(+stream_or_alias, +object_identifier, +predicate_indicator) - zero_or_one`

Exceptions:

Stream is a variable:

`instantiation_error`

Stream is neither a variable nor a stream-term or alias:

`domain_error(stream_or_alias, Stream)`

Stream is not an open stream:

`existence_error(stream, Stream)`

Stream is an output stream:

`permission_error(input, stream, Stream)`

Stream is a binary stream:

`permission_error(input, binary_stream, Stream)`

Object is a variable:

`instantiation_error`

Object is neither a variable nor an object identifier:

`type_error(object_identifier, Object)`

Object is a valid object identifier but not an existing object:

`existence_error(object, Object)`

Predicate is a variable:

`instantiation_error`

Predicate is neither a variable nor a predicate indicator:

`type_error(predicate_indicator, Predicate)`

Predicate is a valid predicate indicator but not an existing public predicate:

`existence_error(predicate, Predicate)`

`read_file_by_line/2`

Reads a TSV file returning the data as a list of rows, each row a list of fields. The file is read line by line. Fails if the file cannot be parsed.

Compilation flags:

`static`

Template:

`read_file_by_line(File,Rows)`

Mode and number of proofs:

`read_file_by_line(+atom,-list(list)) - zero_or_one`

Exceptions:

File is a variable:

`instantiation_error`

File is neither a variable nor an atom:

`type_error(atom,File)`

File is an atom but not an existing file:

`existence_error(file,File)`

File is an existing file but cannot be opened for reading:

`permission_error(open,source_sink,File)`

`read_stream_by_line/2`

Reads a TSV stream returning the data as a list of rows, each row a list of fields. The stream is read line by line. Fails if the stream cannot be parsed.

Compilation flags:

`static`

Template:

`read_stream_by_line(Stream,Rows)`

Mode and number of proofs:

`read_stream_by_line(+stream_or_alias,-list(list)) - zero_or_one`

Exceptions:

Stream is a variable:

`instantiation_error`

Stream is neither a variable nor a stream-term or alias:

```

    domain_error(stream_or_alias,Stream)
Stream is not an open stream:
    existence_error(stream,Stream)
Stream is an output stream:
    permission_error(input,stream,Stream)
Stream is a binary stream:
    permission_error(input,binary_stream,Stream)

```

write_file/3

Writes a TSV file with the data represented by the clauses of the specified object predicate.

Compilation flags:

```
static
```

Template:

```
write_file(File,Object,Predicate)
```

Mode and number of proofs:

```
write_file(+atom,+object_identifier,+predicate_indicator) - one
```

Exceptions:

File is a variable:

```
instantiation_error
```

File is neither a variable nor an atom:

```
type_error(atom,File)
```

File is an atom but cannot be opened for writing:

```
permission_error(open,source_sink,File)
```

Object is a variable:

```
instantiation_error
```

Object is neither a variable nor an object identifier:

```
type_error(object_identifier,Object)
```

Object is a valid object identifier but not an existing object:

```
existence_error(object,Object)
```

Predicate is a variable:

```
instantiation_error
```

Predicate is neither a variable nor a predicate indicator:

```
type_error(predicate_indicator,Predicate)
```

Predicate is a valid predicate indicator but not an existing public predicate:

```
existence_error(predicate,Predicate)
```

write_stream/3

Writes a TSV stream with the data represented by the clauses of the specified object predicate.

Compilation flags:

static

Template:

write_stream(Stream, Object, Predicate)

Mode and number of proofs:

write_stream(+stream_or_alias, +object_identifier, +predicate_indicator) - one

Exceptions:

Stream is a variable:

instantiation_error

Stream is neither a variable nor a stream-term or alias:

domain_error(stream_or_alias, Stream)

Stream is not an open stream:

existence_error(stream, Stream)

Stream is an input stream:

permission_error(output, stream, Stream)

Stream is a binary stream:

permission_error(output, binary_stream, Stream)

Object is a variable:

instantiation_error

Object is neither a variable nor an object identifier:

type_error(object_identifier, Object)

Object is a valid object identifier but not an existing object:

existence_error(object, Object)

Predicate is a variable:

instantiation_error

Predicate is neither a variable nor a predicate indicator:

type_error(predicate_indicator, Predicate)

Predicate is a valid predicate indicator but not an existing public predicate:

existence_error(predicate, Predicate)

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.70 tutor

object

1.70.1 tutor

This object adds explanations and suggestions to selected compiler warning and error messages.

Availability:

`logtalk_load(tutor(loader))`

Author: Paulo Moura

Version: 0:80:0

Date: 2024-12-13

Compilation flags:

`static, context_switching_calls`

Provides:

`logtalk::message_hook/4`

Uses:

`list`

`logtalk`

Remarks:

- Usage: Simply load this object at startup using the goal `logtalk_load(tutor(loader))`.

Inherited public predicates:

(none)

- Public predicates
 - explain//1
- Protected predicates
- Private predicates
- Operators

Public predicates

explain//1

Generates an explanation for a message.

Compilation flags:

static

Template:

explain(Message)

Mode and number of proofs:

explain(@callable) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.71 types

object

1.71.1 atom

Atom data type predicates.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:9:0

Date: 2023-04-12

Compilation flags:

`static, context_switching_calls`

Extends:

`public atomic`

Uses:

`user`

Remarks:

(none)

Inherited public predicates:

`(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3`

- Public predicates
 - `replace_sub_atom/4`
 - `split/3`
- Protected predicates
- Private predicates
- Operators

Public predicates

replace_sub_atom/4

Replaces all occurrences of Old by New in Input returning Output. Returns Input if Old is the empty atom. Fails when Output does not unify with the resulting atom.

Compilation flags:

static

Template:

replace_sub_atom(Old,New,Input,Output)

Mode and number of proofs:

replace_sub_atom(+atom,+atom,+atom,?atom) - zero_or_one

split/3

Splits an atom at a given delimiter into a list of sub-atoms.

Compilation flags:

static

Template:

split(Atom,Delimiter,SubAtoms)

Mode and number of proofs:

split(+atom,+atom,-list(atom)) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.2 atomic

Atomic data type predicates.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:3:0

Date: 2018-07-11

Compilation flags:

`static, context_switching_calls`

Extends:

`public term`

Remarks:

(none)

Inherited public predicates:

`(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.3 callable

Callable term type predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:4:0

Date: 2018-07-11

Compilation flags:

static, context_switching_calls

Extends:

public term

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.4 character

Character predicates (most of them assume an ASCII representation).

Availability:

```
logtalk_load(types(loader))
```

Author: Paulo Moura

Version: 1:9:0

Date: 2019-06-29

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public characterp
```

Extends:

```
public atom
```

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 is_alpha/1
is_alphanumeric/1 is_ascii/1 is_bin_digit/1 is_control/1 is_dec_digit/1 is_end_of_line/1
is_hex_digit/1 is_layout/1 is_letter/1 is_lower_case/1 is_newline/1 is_octal_digit/1
is_period/1 is_punctuation/1 is_quote/1 is_upper_case/1 is_vowel/1 is_white_space/1
lower_upper/2 new/1 numbervars/1 numbervars/3 occurs/2 parenthesis/2 replace_sub_atom/4
singletons/2 split/3 subsumes/2 subterm/2 valid/1 variables/2 variant/2 varnumbers/2
varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.71.5 characterp

Character protocol.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2019-06-29

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - is_ascii/1
 - is_alphanumeric/1
 - is_alpha/1
 - is_letter/1
 - is_bin_digit/1
 - is_octal_digit/1
 - is_dec_digit/1
 - is_hex_digit/1
 - is_lower_case/1
 - is_upper_case/1
 - is_vowel/1
 - is_white_space/1
 - is_layout/1
 - is_quote/1
 - is_punctuation/1
 - is_period/1
 - is_control/1
 - is_newline/1
 - is_end_of_line/1
 - parenthesis/2

- lower_upper/2
- Protected predicates
- Private predicates
- Operators

Public predicates

is_ascii/1

True if the argument is an ASCII character.

Compilation flags:

static

Template:

is_ascii(Char)

Mode and number of proofs:

is_ascii(+char) - zero_or_one

is_alphanumeric/1

True if the argument is an alphanumeric character.

Compilation flags:

static

Template:

is_alphanumeric(Char)

Mode and number of proofs:

is_alphanumeric(+char) - zero_or_one

is_alpha/1

True if the argument is a letter or an underscore.

Compilation flags:

static

Template:

is_alpha(Char)

Mode and number of proofs:

is_alpha(+char) - zero_or_one

is_letter/1

True if the argument is a letter.

Compilation flags:

static

Template:

is_letter(Char)

Mode and number of proofs:

is_letter(+char) - zero_or_one

is_bin_digit/1

True if the argument is a binary digit.

Compilation flags:

static

Template:

is_bin_digit(Char)

Mode and number of proofs:

is_bin_digit(+char) - zero_or_one

`is_octal_digit/1`

True if the argument is an octal digit.

Compilation flags:

`static`

Template:

`is_octal_digit(Char)`

Mode and number of proofs:

`is_octal_digit(+char) - zero_or_one`

`is_dec_digit/1`

True if the argument is a decimal digit.

Compilation flags:

`static`

Template:

`is_dec_digit(Char)`

Mode and number of proofs:

`is_dec_digit(+char) - zero_or_one`

`is_hex_digit/1`

True if the argument is a hexadecimal digit.

Compilation flags:

`static`

Template:

`is_hex_digit(Char)`

Mode and number of proofs:

`is_hex_digit(+char) - zero_or_one`

`is_lower_case/1`

True if the argument is a lower case letter.

Compilation flags:

`static`

Template:

`is_lower_case(Char)`

Mode and number of proofs:

`is_lower_case(+char) - zero_or_one`

`is_upper_case/1`

True if the argument is a upper case letter.

Compilation flags:

`static`

Template:

`is_upper_case(Char)`

Mode and number of proofs:

`is_upper_case(+char) - zero_or_one`

`is_vowel/1`

True if the argument is a vowel.

Compilation flags:

`static`

Template:

`is_vowel(Char)`

Mode and number of proofs:

`is_vowel(+char) - zero_or_one`

is_white_space/1

True if the argument is a white space character (a space or a tab) inside a line of characters.

Compilation flags:

static

Template:

is_white_space(Char)

Mode and number of proofs:

is_white_space(+char) - zero_or_one

is_layout/1

True if the argument is a layout character.

Compilation flags:

static

Template:

is_layout(Char)

Mode and number of proofs:

is_layout(+char) - zero_or_one

is_quote/1

True if the argument is a quote character.

Compilation flags:

static

Template:

is_quote(Char)

Mode and number of proofs:

is_quote(+char) - zero_or_one

is_punctuation/1

True if the argument is a sentence punctuation character.

Compilation flags:

static

Template:

is_punctuation(Char)

Mode and number of proofs:

is_punctuation(+char) - zero_or_one

is_period/1

True if the argument is a character that ends a sentence.

Compilation flags:

static

Template:

is_period(Char)

Mode and number of proofs:

is_period(+char) - zero_or_one

is_control/1

True if the argument is an ASCII control character.

Compilation flags:

static

Template:

is_control(Char)

Mode and number of proofs:

is_control(+char) - zero_or_one

is_newline/1

True if the argument is the ASCII newline character.

Compilation flags:

static

Template:

is_newline(Char)

Mode and number of proofs:

is_newline(+char) - zero_or_one

is_end_of_line/1

True if the argument is the ASCII end-of-line character (either a carriage return or a line feed).

Compilation flags:

static

Template:

is_end_of_line(Char)

Mode and number of proofs:

is_end_of_line(+char) - zero_or_one

parenthesis/2

Recognizes and converts between open and close parenthesis.

Compilation flags:

static

Template:

parenthesis(Char1,Char2)

Mode and number of proofs:

parenthesis(?char,?char) - zero_or_more

parenthesis(+char,?char) - zero_or_one

parenthesis(?char,+char) - zero_or_one

lower_upper/2

Recognizes and converts between lower and upper case letters.

Compilation flags:

static

Template:

lower_upper(Char1,Char2)

Mode and number of proofs:

lower_upper(?char,?char) - zero_or_more

lower_upper(+char,?char) - zero_or_one

lower_upper(?char,+char) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

[character](#)

[protocol](#)

1.71.6 comparingp

Comparing protocol using overloading of standard operators.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:0:0
Date: 2000-07-24

Compilation flags:
static

Dependencies:
(none)

Remarks:
(none)

Inherited public predicates:
(none)

- Public predicates
 - ($<$)/2
 - ($=<$)/2
 - ($>$)/2
 - ($>=$)/2
 - ($=:=$)/2
 - ($=\backslash=$)/2
- Protected predicates
- Private predicates
- Operators

Public predicates

($<$)/2

True if Term1 is less than Term2.

Compilation flags:
static

Template:
Term1<Term2

Mode and number of proofs:

+term< +term - zero_or_one

(=<)/2

True if Term1 is less or equal than Term2.

Compilation flags:

static

Template:

Term1=<Term2

Mode and number of proofs:

+term=< +term - zero_or_one

(>)/2

True if Term1 is greater than Term2.

Compilation flags:

static

Template:

Term1>Term2

Mode and number of proofs:

+term> +term - zero_or_one

(>=)/2

True if Term1 is equal or greater than Term2.

Compilation flags:

static

Template:

Term1>=Term2

Mode and number of proofs:

+term>= +term - zero_or_one

(:=)/2

True if Term1 is equal to Term2.

Compilation flags:

static

Template:

Term1:=Term2

Mode and number of proofs:

+term:= +term - zero_or_one

(=\)/2

True if Term1 is not equal to Term2.

Compilation flags:

static

Template:

Term1=\Term2

Mode and number of proofs:

+term=\ +term - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.71.7 compound

Compound data type.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:3:0

Date: 2018-07-11

Compilation flags:

static, context_switching_calls

Extends:

public term

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.8 difflist

Difference list predicates.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 2:0:0

Date: 2020-05-11

Compilation flags:

`static, context_switching_calls`

Implements:

`public listp`

Extends:

`public compound`

Uses:

`list`

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 append/2 append/3 check/1 delete/3
 delete_matches/3 depth/2 drop/3 empty/1 flatten/2 ground/1 hamming_distance/3 keysort/2
 last/2 length/2 max/2 member/2 memberchk/2 min/2 msort/2 msort/3 new/1 nextto/3
 nth0/3 nth0/4 nth1/3 nth1/4 numbervars/1 numbervars/3 occurrences/2 occurrences/3
 occurs/2 partition/5 permutation/2 prefix/2 prefix/3 proper_prefix/2 proper_prefix/3
 proper_suffix/2 proper_suffix/3 remove_duplicates/2 reverse/2 same_length/2 same_length/3
 select/3 select/4 selectchk/3 selectchk/4 sequential_occurrences/2 sequential_occurrences/3
 singletons/2 sort/2 sort/3 sort/4 split/4 sublist/2 subsequence/3 subsequence/4 substitute/4
 subsumes/2 subterm/2 subtract/3 suffix/2 suffix/3 take/3 valid/1 variables/2 variant/2
 varnumbers/2 varnumbers/3

- Public predicates
 - add/3
 - as_list/2
- Protected predicates
- Private predicates
- Operators

Public predicates

add/3

Adds a term to the end of a difference list.

Compilation flags:

static

Template:

add(Term,DiffList,NewDiffList)

Mode and number of proofs:

add(@term,+difference_list,-difference_list) - one

as_list/2

Returns a list with the elements of the difference list.

Compilation flags:

static

Template:

as_list(DiffList,List)

Mode and number of proofs:

as_list(@difference_list,-list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

list, list(Type), numberlist, varlist

object

1.71.9 float

Floating point numbers data type predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:5:0

Date: 2018-07-15

Compilation flags:

static, context_switching_calls

Extends:

public number

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 =~= / 2 (>)/2 (>=)/2 approximately_equal/2
 approximately_equal/3 check/1 depth/2 essentially_equal/3 ground/1 new/1 numbervars/1
 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 tolerance_equal/4 valid/1
 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.10 integer

Integer data type predicates.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:55:0

Date: 2022-06-21

Compilation flags:

`static, context_switching_calls`

Extends:

`public number`

Remarks:

- Portability notes: This object will use the backend Prolog system `between/3`, `plus/3`, and `succ/2` built-in predicates when available.

Inherited public predicates:

`(<)/2` `(=:)/2` `(=<)/2` `(=\=)/2` `=~/2` `(>)/2` `(>=)/2` `approximately_equal/2`
`approximately_equal/3` `check/1` `depth/2` `essentially_equal/3` `ground/1` `new/1` `numbervars/1`
`numbervars/3` `occurs/2` `singletons/2` `subsumes/2` `subterm/2` `tolerance_equal/4` `valid/1`
`variables/2` `variant/2` `varnumbers/2` `varnumbers/3`

- Public predicates
 - `between/3`
 - `plus/3`
 - `succ/2`
 - `sequence/3`
 - `sequence/4`
- Protected predicates
- Private predicates
- Operators

Public predicates

between/3

Returns integers in the interval defined by the two first arguments.

Compilation flags:

static

Template:

between(Lower,Upper,Integer)

Mode and number of proofs:

between(+integer,+integer,+integer) - zero_or_one

between(+integer,+integer,-integer) - zero_or_more

plus/3

Reversible integer sum. At least two of the arguments must be instantiated to integers.

Compilation flags:

static

Template:

plus(I,J,Sum)

Mode and number of proofs:

plus(+integer,+integer,?integer) - zero_or_one

plus(+integer,?integer,+integer) - zero_or_one

plus(?integer,+integer,+integer) - zero_or_one

succ/2

Successor of a natural number. At least one of the arguments must be instantiated to a natural number.

Compilation flags:

static

Template:

succ(I,J)

Mode and number of proofs:

succ(+integer,?integer) - zero_or_one

succ(?integer,+integer) - zero_or_one

sequence/3

Generates a list with the sequence of all integers in the interval [Lower,Upper]. Assumes Lower =< Upper and fails otherwise.

Compilation flags:

static

Template:

sequence(Lower,Upper,List)

Mode and number of proofs:

sequence(+integer,+integer,-list(integer)) - zero_or_one

sequence/4

Generates a list with the sequence of integers in the interval [Lower,Upper] by Step. Assumes Lower =< Upper, Step >= 1 and fails otherwise.

Compilation flags:

static

Template:

sequence(Lower,Upper,Step,List)

Mode and number of proofs:

sequence(+integer,+integer,+integer,-list(integer)) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.11 list

List predicates.

Availability:

```
logtalk_load(types(loader))
```

Author: Paulo Moura

Version: 4:3:0

Date: 2024-05-24

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public listp
```

Extends:

```
public compound
```

Remarks:

- Portability notes: This object will use the backend Prolog system `msort/2` and `sort/4` built-in predicates when available.

Inherited public predicates:

```
(<)/2 (=:=)/2 (= <)/2 (= \=)/2 (>)/2 (>=)/2 append/2 append/3 check/1 delete/3
delete_matches/3 depth/2 drop/3 empty/1 flatten/2 ground/1 hamming_distance/3 keysort/2
last/2 length/2 max/2 member/2 memberchk/2 min/2 msort/2 msort/3 new/1 nextto/3
nth0/3 nth0/4 nth1/3 nth1/4 numbervars/1 numbervars/3 occurrences/2 occurrences/3
occurs/2 partition/5 permutation/2 prefix/2 prefix/3 proper_prefix/2 proper_prefix/3
```

proper_suffix/2 proper_suffix/3 remove_duplicates/2 reverse/2 same_length/2 same_length/3
select/3 select/4 selectchk/3 selectchk/4 sequential_occurrences/2 sequential_occurrences/3
singletons/2 sort/2 sort/3 sort/4 split/4 sublist/2 subsequence/3 subsequence/4 substitute/4
subsumes/2 subterm/2 subtract/3 suffix/2 suffix/3 take/3 valid/1 variables/2 variant/2
varnumbers/2 varnumbers/3

- Public predicates
 - as_difflist/2
- Protected predicates
- Private predicates
- Operators

Public predicates

as_difflist/2

Converts a list to a difference list.

Compilation flags:

static

Template:

as_difflist(List,Diffist)

Mode and number of proofs:

as_difflist(+list,-difference_list) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`list(Type)`, `numberlist`, `varlist`, `difflist`

object

1.71.12 `list(Type)`

List predicates with elements constrained to a single type.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:22:0

Date: 2018-07-11

Compilation flags:

`static, context_switching_calls`

Extends:

`public list`

Remarks:

(none)

Inherited public predicates:

`(<)/2` `(=:=)/2` `(=<)/2` `(=\=)/2` `(>)/2` `(>=)/2` `append/2` `append/3` `as_difflist/2` `check/1`
`delete/3` `delete_matches/3` `depth/2` `drop/3` `empty/1` `flatten/2` `ground/1` `hamming_distance/3`
`keysort/2` `last/2` `length/2` `max/2` `member/2` `memberchk/2` `min/2` `msort/2` `msort/3` `new/1`
`nextto/3` `nth0/3` `nth0/4` `nth1/3` `nth1/4` `numbervars/1` `numbervars/3` `occurrences/2`
`occurrences/3` `occurs/2` `partition/5` `permutation/2` `prefix/2` `prefix/3` `proper_prefix/2`
`proper_prefix/3` `proper_suffix/2` `proper_suffix/3` `remove_duplicates/2` `reverse/2` `same_length/2`
`same_length/3` `select/3` `select/4` `selectchk/3` `selectchk/4` `sequential_occurrences/2`
`sequential_occurrences/3` `singletons/2` `sort/2` `sort/3` `sort/4` `split/4` `sublist/2` `subsequence/3`
`subsequence/4` `substitute/4` `subsumes/2` `subterm/2` `subtract/3` `suffix/2` `suffix/3` `take/3` `valid/1`
`variables/2` `variant/2` `varnumbers/2` `varnumbers/3`

- Public predicates
- Protected predicates

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`list`, `numberlist`, `varlist`, `difflist`

`protocol`

1.71.13 `listp`

List protocol.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:18:0

Date: 2024-05-24

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - append/2
 - append/3
 - delete/3
 - delete_matches/3
 - empty/1
 - flatten/2
 - hamming_distance/3
 - keysort/2
 - last/2
 - length/2
 - max/2
 - member/2
 - memberchk/2
 - min/2
 - msort/2
 - msort/3
 - nextto/3
 - nth0/3
 - nth0/4
 - nth1/3
 - nth1/4
 - sequential_occurrences/2
 - sequential_occurrences/3
 - occurrences/2
 - occurrences/3
 - partition/5
 - permutation/2
 - prefix/2
 - prefix/3
 - proper_prefix/2
 - proper_prefix/3

- remove_duplicates/2
 - reverse/2
 - same_length/2
 - same_length/3
 - select/3
 - selectchk/3
 - select/4
 - selectchk/4
 - sort/2
 - sort/3
 - sort/4
 - split/4
 - sublist/2
 - subsequence/3
 - subsequence/4
 - substitute/4
 - subtract/3
 - suffix/2
 - suffix/3
 - proper_suffix/2
 - proper_suffix/3
 - take/3
 - drop/3
- Protected predicates
 - Private predicates
 - Operators

Public predicates

append/2

Appends all lists in a list of lists.

Compilation flags:

static

Template:

append(Lists,Concatenation)

Mode and number of proofs:

append(+list(list),?list) - zero_or_one

append/3

Appends two lists.

Compilation flags:

static

Template:

append(List1,List2,List)

Mode and number of proofs:

append(?list,?list,?list) - zero_or_more

delete/3

Deletes from a list all occurrences of an element returning the list of remaining elements. Uses ==/2 for element comparison.

Compilation flags:

static

Template:

delete(List,Element,Remaining)

Mode and number of proofs:

delete(@list,@term,?list) - one

delete_matches/3

Deletes all matching elements from a list, returning the list of remaining elements. Uses =/2 for element comparison.

Compilation flags:

static

Template:

delete_matches(List,Element,Remaining)

Mode and number of proofs:

delete_matches(@list,@term,?list) - one

empty/1

True if the argument is an empty list.

Compilation flags:

static

Template:

empty(List)

Mode and number of proofs:

empty(@list) - zero_or_one

flatten/2

Flattens a list of lists into a list.

Compilation flags:

static

Template:

flatten(List,Flatted)

Mode and number of proofs:

flatten(+list,-list) - one

hamming_distance/3

Calculates the Hamming distance between two lists (using equality to compare list elements). Fails if the two lists are not of the same length.

Compilation flags:

static

Template:

hamming_distance(List1,List2,Distance)

Mode and number of proofs:

hamming_distance(+list,+list,-integer) - zero_or_one

keysort/2

Sorts a list of key-value pairs in ascending order.

Compilation flags:

static

Template:

keysort(List,Sorted)

Mode and number of proofs:

keysort(+list(pair),-list(pair)) - one

last/2

List last element (if it exists).

Compilation flags:

static

Template:

last(List,Last)

Mode and number of proofs:

last(?list,?term) - zero_or_more

length/2

List length.

Compilation flags:

static

Template:

length(List,Length)

Mode and number of proofs:

length(?list,?integer) - zero_or_more

max/2

Determines the list maximum value using standard order. Fails if the list is empty.

Compilation flags:

static

Template:

max(List,Maximum)

Mode and number of proofs:

max(+list,-term) - zero_or_one

member/2

Element is a list member.

Compilation flags:

static

Template:

member(Element,List)

Mode and number of proofs:

member(?term,?list) - zero_or_more

memberchk/2

Checks if a term is a member of a list.

Compilation flags:

static

Template:

memberchk(Element,List)

Mode and number of proofs:

memberchk(?term,?list) - zero_or_one

min/2

Determines the minimum value in a list using standard order. Fails if the list is empty.

Compilation flags:

static

Template:

min(List,Minimum)

Mode and number of proofs:

min(+list,-term) - zero_or_one

`mSORT/2`

Sorts a list in ascending order (duplicated elements are not removed).

Compilation flags:

`static`

Template:

`mSORT(List,Sorted)`

Mode and number of proofs:

`mSORT(+list,-list) - one`

`mSORT/3`

Sorts a list using a user-specified comparison predicate modeled on the standard `compare/3` predicate (duplicated elements are not removed).

Compilation flags:

`static`

Template:

`mSORT(Closure,List,Sorted)`

Meta-predicate template:

`mSORT(3,*,*)`

Mode and number of proofs:

`mSORT(+callable,+list,-list) - one`

`nextto/3`

X and Y are consecutive elements in List.

Compilation flags:

`static`

Template:

`nextto(X,Y,List)`

Mode and number of proofs:

`nextto(?term,?term,?list) - zero_or_more`

`nth0/3`

Nth element of a list (counting from zero).

Compilation flags:

`static`

Template:

`nth0(Nth,List,Element)`

Mode and number of proofs:

`nth0(?integer,?list,?term) - zero_or_more`

`nth0/4`

Nth element of a list (counting from zero). Rest is a list of all the other elements. Can be used to either select the nth element of List or to insert an element before the nth element in Rest.

Compilation flags:

`static`

Template:

`nth0(Nth,List,Element,Rest)`

Mode and number of proofs:

`nth0(?integer,?list,?term,?list) - zero_or_more`

`nth1/3`

Nth element of a list (counting from one).

Compilation flags:

`static`

Template:

`nth1(Nth,List,Element)`

Mode and number of proofs:

`nth1(?integer,?list,?term) - zero_or_more`

`nth1/4`

Nth element of a list (counting from one). Rest is a list of all the other elements. Can be used to either select the nth element of List or to insert an element before the nth element in Rest.

Compilation flags:

`static`

Template:

`nth1(Nth,List,Element,Rest)`

Mode and number of proofs:

`nth1(?integer,?list,?term,?list) - zero_or_more`

`sequential_occurrences/2`

Counts the number of sequential occurrences of each List element, unifying Occurrences with a list of Element-Count pairs. Uses term equality for element comparison.

Compilation flags:

`static`

Template:

`sequential_occurrences(List,Occurrences)`

Mode and number of proofs:

`sequential_occurrences(@list,-list(pair(term,positive_integer))) - one`

sequential_occurrences/3

Counts the number of sequential occurrences of each List element, unifying Occurrences with a list of Element-Count pairs. Uses Closure for element comparison.

Compilation flags:

static

Template:

sequential_occurrences(List,Closure,Occurrences)

Mode and number of proofs:

sequential_occurrences(@list,@callable,-list(pair(term,positive_integer))) - one

occurrences/2

Counts the number of occurrences of each List element, unifying Occurrences with a sorted list of Element-Count pairs. Uses term equality for element comparison.

Compilation flags:

static

Template:

occurrences(List,Occurrences)

Mode and number of proofs:

occurrences(@list,-list(pair(term,positive_integer))) - one

occurrences/3

Counts the number of occurrences of each List element, unifying Occurrences with a sorted list of Element-Count pairs. Uses Closure for element comparison.

Compilation flags:

static

Template:

occurrences(List,Closure,Occurrences)

Meta-predicate template:

occurrences(*,2,*)

Mode and number of proofs:

occurrences(@list,@callable,-list(pair(term,positive_integer))) - one

partition/5

Partitions a list in lists with values less, equal, and greater than a given value (using standard order).

Compilation flags:

static

Template:

partition(List,Value,Less,Equal,Greater)

Mode and number of proofs:

partition(+list,+number,-list,-list,-list) - one

permutation/2

The two lists are a permutation of the same list.

Compilation flags:

static

Template:

permutation(List,Permutation)

Mode and number of proofs:

permutation(?list,?list) - zero_or_more

prefix/2

Prefix is a prefix of List.

Compilation flags:

static

Template:

prefix(Prefix,List)

Mode and number of proofs:

prefix(?list,+list) - zero_or_more

prefix/3

Prefix is a prefix of length Length of List.

Compilation flags:

static

Template:

prefix(Prefix,Length,List)

Mode and number of proofs:

prefix(?list,+integer,+list) - zero_or_one

prefix(?list,-integer,+list) - zero_or_more

proper_prefix/2

Prefix is a proper prefix of List.

Compilation flags:

static

Template:

proper_prefix(Prefix,List)

Mode and number of proofs:

proper_prefix(?list,+list) - zero_or_more

proper_prefix/3

Prefix is a proper prefix of length Length of List.

Compilation flags:

static

Template:

proper_prefix(Prefix,Length,List)

Mode and number of proofs:

proper_prefix(?list,+integer,+list) - zero_or_one

proper_prefix(?list,-integer,+list) - zero_or_more

remove_duplicates/2

Removes duplicated list elements using equality (`==/2`) for comparison and keeping the left-most element when repeated.

Compilation flags:

static

Template:

remove_duplicates(List,Set)

Mode and number of proofs:

remove_duplicates(+list,-list) - one

reverse/2

Reverses a list.

Compilation flags:

static

Template:

```
reverse(List,Reversed)
```

Mode and number of proofs:

```
reverse(+list,?list) - zero_or_one
```

```
reverse(?list,+list) - zero_or_one
```

```
reverse(-list,-list) - one_or_more
```

```
same_length/2
```

The two lists have the same length.

Compilation flags:

```
static
```

Template:

```
same_length(List1,List2)
```

Mode and number of proofs:

```
same_length(+list,?list) - zero_or_one
```

```
same_length(?list,+list) - zero_or_one
```

```
same_length(-list,-list) - one_or_more
```

```
same_length/3
```

The two lists have the same length.

Compilation flags:

```
static
```

Template:

```
same_length(List1,List2,Length)
```

Mode and number of proofs:

```
same_length(+list,?list,?integer) - zero_or_one
```

```
same_length(?list,+list,?integer) - zero_or_one
```

```
same_length(-list,-list,-integer) - one_or_more
```

select/3

Selects an element from a list, returning the list of remaining elements.

Compilation flags:

static

Template:

select(Element,List,Remaining)

Mode and number of proofs:

select(?term,?list,?list) - zero_or_more

selectchk/3

Checks that an element can be selected from a list, returning the list of remaining elements.

Compilation flags:

static

Template:

selectchk(Element,List,Remaining)

Mode and number of proofs:

selectchk(?term,?list,?list) - zero_or_one

select/4

Selects an element from a list, replacing it by a new element and returning the resulting list.

Compilation flags:

static

Template:

select(Old,OldList,New,NewList)

Mode and number of proofs:

select(?term,?list,?term,?list) - zero_or_more

selectchk/4

Checks that an element from a list can be replaced by a new element, returning the resulting list.

Compilation flags:

static

Template:

selectchk(Old,OldList,New,NewList)

Mode and number of proofs:

selectchk(?term,?list,?term,?list) - zero_or_one

sort/2

Sorts a list in ascending order (duplicated elements are removed).

Compilation flags:

static

Template:

sort(List,Sorted)

Mode and number of proofs:

sort(+list,-list) - one

sort/3

Sorts a list using a user-specified comparison predicate modeled on the standard compare/3 predicate (duplicated elements are removed).

Compilation flags:

static

Template:

sort(Closure,List,Sorted)

Meta-predicate template:

sort(3,*,*)

Mode and number of proofs:

sort(+callable,+list,-list) - one

sort/4

Sorts a list using the given key and order. Uses the standard term comparison operators for the order. The key selects the argument in each element in the list to use for comparisons. A key value of zero uses the whole element for comparisons.

Compilation flags:

static

Template:

sort(Key,Order,List,Sorted)

Mode and number of proofs:

sort(+non_negative_integer,+atom,+list,-list) - one

Remarks:

- Removing duplicates: Use one of the @< or @> orders.
 - Keeping duplicates: Use one of the @=< or @>= orders.
 - Sorting in ascending order: Use one of the @< or @=< orders.
 - Sorting in descending order: Use one of the @> or @>= orders.
-

split/4

Splits a list into sublists of a given length. Also returns a list with the remaining elements. Fails if the length is zero or negative.

Compilation flags:

static

Template:

split(List,Length,Sublists,Remaining)

Mode and number of proofs:

split(+list,+integer,-list(list),-list) - zero_or_one

sublist/2

The first list is a sublist of the second.

Compilation flags:

static

Template:

sublist(Sublist,List)

Mode and number of proofs:

sublist(?list,+list) - zero_or_more

subsequence/3

List is an interleaving of Subsequence and Remaining. Element order is preserved.

Compilation flags:

static

Template:

subsequence(List,Subsequence,Remaining)

Mode and number of proofs:

subsequence(?list,?list,?list) - zero_or_more

subsequence/4

Generates subsequences of a given length from a list. Also returns the remaining elements. Element order is preserved.

Compilation flags:

static

Template:

subsequence(List,Length,Subsequence,Remaining)

Mode and number of proofs:

subsequence(+list,+integer,?list,?list) - zero_or_more

substitute/4

Substitutes all occurrences of Old in List by New, returning NewList. Uses term equality for element comparison.

Compilation flags:

static

Template:

substitute(Old,List,New,NewList)

Mode and number of proofs:

substitute(@term,@list,@term,-list) - one

subtract/3

Removes all elements in the second list from the first list, returning the list of remaining elements.

Compilation flags:

static

Template:

subtract(List,Elements,Remaining)

Mode and number of proofs:

subtract(+list,+list,-list) - one

suffix/2

Suffix is a suffix of List.

Compilation flags:

static

Template:

suffix(Suffix,List)

Mode and number of proofs:

suffix(?list,+list) - zero_or_more

suffix/3

Suffix is a suffix of length Length of List.

Compilation flags:

static

Template:

suffix(Suffix,Length,List)

Mode and number of proofs:

suffix(?list,+integer,+list) - zero_or_one

suffix(?list,-integer,+list) - zero_or_more

proper_suffix/2

Suffix is a proper suffix of List.

Compilation flags:

static

Template:

proper_suffix(Suffix,List)

Mode and number of proofs:

proper_suffix(?list,+list) - zero_or_more

proper_suffix/3

Suffix is a proper suffix of length Length of List.

Compilation flags:

static

Template:

proper_suffix(Suffix,Length,List)

Mode and number of proofs:

proper_suffix(?list,+integer,+list) - zero_or_one

proper_suffix(?list,-integer,+list) - zero_or_more

take/3

Takes the first N elements of a list. Fails if the list have fewer than N elements.

Compilation flags:

static

Template:

take(N,List,Elements)

Mode and number of proofs:

take(+integer,+list,-list) - zero_or_one

drop/3

Drops the first N elements of a list. Fails if the list have fewer than N elements.

Compilation flags:

static

Template:

drop(N,List,Remaining)

Mode and number of proofs:

drop(+integer,+list,-list) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

list, list(Type), numberlistp, varlistp

object

1.71.14 natural

Natural numbers data type predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:1:0

Date: 2009-03-06

Compilation flags:

static, context_switching_calls

Extends:

public integer

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 =~= / 2 (>)/2 (>=)/2 approximately_equal/2
approximately_equal/3 between/3 check/1 depth/2 essentially_equal/3 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 plus/3 sequence/3 sequence/4 singletons/2 subsumes/2
subterm/2 succ/2 tolerance_equal/4 valid/1 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.71.15 number

Number data type predicates.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:14:0

Date: 2023-12-07

Compilation flags:

`static, context_switching_calls`

Extends:

`public atomic`

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
variant/2 varnumbers/2 varnumbers/3

- Public predicates
 - approximately_equal/2
 - approximately_equal/3
 - essentially_equal/3
 - tolerance_equal/4
 - ==~ / 2
- Protected predicates
- Private predicates
- Operators
 - op(700,xfx,==~)

Public predicates

approximately_equal/2

Compares two numbers for approximate equality given the epsilon arithmetic constant value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{epsilon}$. No type-checking.

Compilation flags:

static

Template:

approximately_equal(Number1,Number2)

Mode and number of proofs:

approximately_equal(+number,+number) - zero_or_one

`approximately_equal/3`

Compares two numbers for approximate equality given a user-defined epsilon value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{Epsilon}$. No type-checking.

Compilation flags:

`static`

Template:

`approximately_equal(Number1,Number2,Epsilon)`

Mode and number of proofs:

`approximately_equal(+number,+number,+number) - zero_or_one`

Remarks:

- Epsilon range: Epsilon should be the epsilon arithmetic constant value or a small multiple of it. Only use a larger value if a greater error is expected.
 - Comparison with essential equality: For the same epsilon value, approximate equality is weaker requirement than essential equality.
-

`essentially_equal/3`

Compares two numbers for essential equality given an epsilon value using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \min(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})) * \text{Epsilon}$. No type-checking.

Compilation flags:

`static`

Template:

`essentially_equal(Number1,Number2,Epsilon)`

Mode and number of proofs:

`essentially_equal(+number,+number,+number) - zero_or_one`

Remarks:

- Comparison with approximate equality: For the same epsilon value, essential equality is a stronger requirement than approximate equality.
-

tolerance_equal/4

Compares two numbers for close equality given relative and absolute tolerances using the de facto standard formula $\text{abs}(\text{Number1} - \text{Number2}) \leq \max(\text{RelativeTolerance} * \max(\text{abs}(\text{Number1}), \text{abs}(\text{Number2})), \text{AbsoluteTolerance})$. No type-checking.

Compilation flags:

static

Template:

tolerance_equal(Number1,Number2,RelativeTolerance,AbsoluteTolerance)

Mode and number of proofs:

tolerance_equal(+number,+number,+number,+number) - zero_or_one

=~/= / 2

Compares two floats (or lists of floats) for approximate equality using $100 * \text{epsilon}$ for the absolute error and, if that fails, 99.999% accuracy for the relative error. Note that these precision values may not be adequate for all cases. No type-checking.

Compilation flags:

static

Template:

=~/=(Float1,Float2)

Mode and number of proofs:

=~/=(+number,+number) - zero_or_one

=~/=(+list(number),+list(number)) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

op(700,xfx,=~=)

Scope:

public

object

1.71.16 numberlist

List of numbers predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:15:2

Date: 2024-06-12

Compilation flags:

static, context_switching_calls

Implements:

public numberlistp

Extends:

public list

Uses:

list

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 append/2 append/3 as_difflist/2 average/2
chebyshev_distance/3 chebyshev_norm/2 check/1 delete/3 delete_matches/3 depth/2 drop/3
empty/1 euclidean_distance/3 euclidean_norm/2 flatten/2 ground/1 hamming_distance/3
keysort/2 last/2 least_common_multiple/2 length/2 manhattan_distance/3 manhattan_norm/2
max/2 median/2 member/2 memberchk/2 min/2 min_max/3 modes/2 msort/2 msort/3

new/1 nextto/3 normalize_range/2 normalize_range/4 normalize_scalar/2 normalize_unit/2
 nth0/3 nth0/4 nth1/3 nth1/4 numbervars/1 numbervars/3 occurrences/2 occurrences/3
 occurs/2 partition/5 permutation/2 prefix/2 prefix/3 product/2 proper_prefix/2
 proper_prefix/3 proper_suffix/2 proper_suffix/3 remove_duplicates/2 rescale/3 reverse/2
 same_length/2 same_length/3 scalar_product/3 select/3 select/4 selectchk/3 selectchk/4
 sequential_occurrences/2 sequential_occurrences/3 singletons/2 sort/2 sort/3 sort/4 split/4
 sublist/2 subsequence/3 subsequence/4 substitute/4 subsumes/2 subterm/2 subtract/3 suffix/2
 suffix/3 sum/2 take/3 valid/1 variables/2 variant/2 varnumbers/2 varnumbers/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

list, list(Type), varlist, difflist

protocol

1.71.17 numberlistp

List of numbers protocol.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:9:0

Date: 2023-12-10

Compilation flags:

static

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - min/2
 - max/2
 - min_max/3
 - product/2
 - sum/2
 - average/2
 - median/2
 - modes/2
 - euclidean_norm/2
 - chebyshev_norm/2
 - manhattan_norm/2
 - euclidean_distance/3
 - chebyshev_distance/3
 - manhattan_distance/3
 - scalar_product/3
 - normalize_range/2
 - normalize_range/4
 - normalize_unit/2
 - normalize_scalar/2
 - rescale/3
 - least_common_multiple/2

- Protected predicates
- Private predicates
- Operators

Public predicates

min/2

Determines the minimum value in a list using arithmetic order. Fails if the list is empty.

Compilation flags:

static

Template:

min(List,Minimum)

Mode and number of proofs:

min(+list(number),-number) - zero_or_one

max/2

Determines the list maximum value using arithmetic order. Fails if the list is empty.

Compilation flags:

static

Template:

max(List,Maximum)

Mode and number of proofs:

max(+list(number),-number) - zero_or_one

min_max/3

Determines the minimum and maximum values in a list using arithmetic order. Fails if the list is empty.

Compilation flags:

static

Template:

min_max(List,Minimum,Maximum)

Mode and number of proofs:

min_max(+list(number),-number,-number) - zero_or_one

product/2

Calculates the product of all list numbers. Fails if the list is empty.

Compilation flags:

static

Template:

product(List,Product)

Mode and number of proofs:

product(+list(number),-number) - zero_or_one

sum/2

Calculates the sum of all list numbers. Returns the integer zero if the list is empty.

Compilation flags:

static

Template:

sum(List,Sum)

Mode and number of proofs:

sum(+list(number),-number) - one

average/2

Calculates the average (i.e., arithmetic mean) of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

average(List,Average)

Mode and number of proofs:

average(+list(number),-float) - zero_or_one

median/2

Calculates the median of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

median(List,Median)

Mode and number of proofs:

median(+list(number),-float) - zero_or_one

modes/2

Returns the list of modes of a list of numbers in ascending order. Fails if the list is empty.

Compilation flags:

static

Template:

modes(List,Modes)

Mode and number of proofs:

modes(+list(number),-list(number)) - zero_or_one

euclidean_norm/2

Calculates the Euclidean norm of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

euclidean_norm(List, Norm)

Mode and number of proofs:

euclidean_norm(+list(number), -float) - zero_or_one

chebyshev_norm/2

Calculates the Chebyshev norm of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

chebyshev_norm(List, Norm)

Mode and number of proofs:

chebyshev_norm(+list(integer), -integer) - zero_or_one

chebyshev_norm(+list(float), -float) - zero_or_one

manhattan_norm/2

Calculates the Manhattan norm of a list of numbers. Fails if the list is empty.

Compilation flags:

static

Template:

manhattan_norm(List, Norm)

Mode and number of proofs:

manhattan_norm(+list(integer), -integer) - zero_or_one

manhattan_norm(+list(float), -float) - zero_or_one

`euclidean_distance/3`

Calculates the Euclidean distance between two lists of numbers. Fails if the two lists are empty or not of the same length.

Compilation flags:

`static`

Template:

`euclidean_distance(List1,List2,Distance)`

Mode and number of proofs:

`euclidean_distance(+list(number),+list(number),-float) - zero_or_one`

`chebyshev_distance/3`

Calculates the Chebyshev distance between two lists of numbers. Fails if the two lists are empty or not of the same length.

Compilation flags:

`static`

Template:

`chebyshev_distance(List1,List2,Distance)`

Mode and number of proofs:

`chebyshev_distance(+list(integer),+list(integer),-integer) - zero_or_one`

`chebyshev_distance(+list(float),+list(float),-float) - zero_or_one`

`manhattan_distance/3`

Calculates the Manhattan distance between two lists of numbers. Fails if the two lists are empty or not of the same length.

Compilation flags:

`static`

Template:

```
manhattan_distance(List1,List2,Distance)
```

Mode and number of proofs:

```
manhattan_distance(+list(integer),+list(integer),-integer) - zero_or_one  
manhattan_distance(+list(float),+list(float),-float) - zero_or_one
```

scalar_product/3

Calculates the scalar product of two lists of numbers. Fails if the two lists are empty or not of the same length.

Compilation flags:

```
static
```

Template:

```
scalar_product(List1,List2,Product)
```

Mode and number of proofs:

```
scalar_product(+list(integer),+list(integer),-integer) - zero_or_one  
scalar_product(+list(float),+list(float),-float) - zero_or_one
```

normalize_range/2

Normalizes a list of numbers into the [0.0,1.0] range. Caller must handle arithmetic exceptions if the input list is not normalizable.

Compilation flags:

```
static
```

Template:

```
normalize_range(List,NormalizedList)
```

Mode and number of proofs:

```
normalize_range(+list(number),-list(float)) - one
```

`normalize_range/4`

Normalizes a list of numbers into the given range. Caller must handle arithmetic exceptions if the input list if not normalizable.

Compilation flags:

`static`

Template:

`normalize_range(List,Minimum,Maximum,NormalizedList)`

Mode and number of proofs:

`normalize_range(+list(number),+number,+number,-list(float)) - one`

`normalize_unit/2`

Normalizes a list of numbers returning its unit vector (i.e., a list with Euclidean norm equal to one). Caller must handle arithmetic exceptions if the input list if not normalizable.

Compilation flags:

`static`

Template:

`normalize_unit(List,NormalizedList)`

Mode and number of proofs:

`normalize_unit(+list(number),-list(float)) - one`

`normalize_scalar/2`

Normalizes a list of numbers such that the sum of all numbers is equal to one. Caller must handle arithmetic exceptions if the input list if not normalizable.

Compilation flags:

`static`

Template:

`normalize_scalar(List,NormalizedList)`

Mode and number of proofs:

`normalize_scalar(+list(number),-list(float)) - one`

`rescale/3`

Rescales all numbers in a list by the given factor.

Compilation flags:

`static`

Template:

`rescale(List,Factor,RescaledList)`

Mode and number of proofs:

`rescale(+list(integer),+integer,-list(integer)) - one`

`rescale(+list(number),+float,-list(float)) - one`

`least_common_multiple/2`

Computes the least common multiple of a list of two or more positive integers. Fails if the list is empty or contains a single element. Fails also if any of the elements is zero. May require backend support for unbound integer arithmetic.

Compilation flags:

`static`

Template:

`least_common_multiple(Integers,LeastCommonMultiple)`

Mode and number of proofs:

`least_common_multiple(+list(positive_integer),-positive_integer) - zero_or_one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

numberlist, listp, varlistp

object

1.71.18 pairs

Useful predicates over lists of pairs (key-value terms).

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 2:1:1

Date: 2023-11-21

Compilation flags:

`static, context_switching_calls`

Dependencies:

(none)

Remarks:

- Usage: This object can be loaded independently of other entities in the types library by using the goal `logtalk_load(types(pairs))`.

Inherited public predicates:

(none)

- Public predicates
 - keys_values/3
 - keys/2
 - key/2
 - values/2
 - value/3
 - transpose/2
 - group_sorted_by_key/2
 - group_consecutive_by_key/2
 - group_by_key/2
 - map/3
- Protected predicates
- Private predicates
- Operators

Public predicates

keys_values/3

Converts between a list of pairs and lists of keys and values. When converting to pairs, this predicate fails if the list of keys and the list of values have different lengths.

Compilation flags:

static

Template:

keys_values(Pairs,Keys,Values)

Mode and number of proofs:

keys_values(+list(pair),-list,-list) - one

keys_values(-list(pair),+list,+list) - zero_or_one

keys/2

Returns a list of keys from a list of pairs.

Compilation flags:

static

Template:

keys(Pairs,Keys)

Mode and number of proofs:

keys(+list(pair),-list) - one

key/2

Enumerates by backtracking all keys from a list of pairs.

Compilation flags:

static

Template:

key(Pairs,Key)

Mode and number of proofs:

key(+list(pair),-term) - zero_or_more

values/2

Returns a list of values from a list of pairs.

Compilation flags:

static

Template:

values(Pairs,Values)

Mode and number of proofs:

values(+list(pair),-list) - one

value/3

Returns a value addressed by the given path (a key or a list of keys in the case of nested list of pairs). Fails if path does not exist.

Compilation flags:

static

Template:

value(Pairs,Path,Value)

Mode and number of proofs:

value(+list(pair),+term,-term) - zero_or_one

value(+list(pair),+list,-term) - zero_or_one

transpose/2

Transposes a list of pairs by swapping each pair key and value. The relative order of the list elements is kept.

Compilation flags:

static

Template:

transpose(Pairs,TransposedPairs)

Mode and number of proofs:

transpose(+list(pair),-list(pair)) - one

group_sorted_by_key/2

Groups pairs by key by sorting them and then constructing new pairs by grouping all values for a given key in a list. Keys are compared using equality. Relative order of values per key is kept. Resulting list of pairs is sorted by key.

Compilation flags:

static

Template:

`group_sorted_by_key(Pairs,Groups)`

Mode and number of proofs:

`group_sorted_by_key(+list(pair),-list(pair)) - one`

`group_consecutive_by_key/2`

Groups pairs by constructing new pairs by grouping all values for consecutive key in a list. Keys are compared using equality. The relative order of the values for the same key is kept.

Compilation flags:

`static`

Template:

`group_consecutive_by_key(Pairs,Groups)`

Mode and number of proofs:

`group_consecutive_by_key(+list(pair),-list(pair)) - one`

`group_by_key/2`

Same as the `group_sorted_by_key/2` predicate. Deprecated.

Compilation flags:

`static`

Template:

`group_by_key(Pairs,Groups)`

Mode and number of proofs:

`group_by_key(+list(pair),-list(pair)) - one`

map/3

Maps a list into pairs using a closure that applies to each list element to compute its key.

Compilation flags:

static

Template:

map(Closure,List,Pairs)

Meta-predicate template:

map(2,*,*)

Mode and number of proofs:

map(@callable,+list,-list(pair)) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.71.19 term

Term utility predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 1:11:0

Date: 2022-05-13

Compilation flags:

static, context_switching_calls

Implements:

public term

Aliases:

term variables/2 as vars/2

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 ground/1 new/1
 numbervars/1 numbervars/3 occurs/2 singletons/2 subsumes/2 subterm/2 valid/1 variables/2
 variant/2 varnumbers/2 varnumbers/3

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.71.20 `termp`

Term utility predicates protocol.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:35:0

Date: 2022-05-13

Compilation flags:

`static`

Extends:

`public comparingp`

Remarks:

`(none)`

Inherited public predicates:

`(<)/2` `(=:=)/2` `(=<)/2` `(=\=)/2` `(>)/2` `(>=)/2`

- Public predicates
 - `depth/2`
 - `ground/1`
 - `new/1`
 - `occurs/2`
 - `subsumes/2`
 - `subterm/2`
 - `valid/1`
 - `check/1`
 - `variant/2`
 - `variables/2`
 - `singletons/2`
 - `numbervars/3`
 - `numbervars/1`

- varnumbers/3
- varnumbers/2
- Protected predicates
- Private predicates
- Operators

Public predicates

depth/2

True if the depth of Term is Depth. The depth of atomic terms is zero; the depth of a compound term is one plus the maximum depth of its sub-terms.

Compilation flags:

static

Template:

depth(Term,Depth)

Mode and number of proofs:

depth(@term,?integer) - zero_or_one

ground/1

True if the argument is ground. Deprecated. Use the ground/1 standard predicate instead.

Compilation flags:

static

Template:

ground(Term)

Mode and number of proofs:

ground(@term) - zero_or_one

new/1

Creates a new term instance (if meaningful).

Compilation flags:

static

Template:

new(Term)

Mode and number of proofs:

new(-nonvar) - zero_or_one

occurs/2

True if the variable occurs in the term.

Compilation flags:

static

Template:

occurs(Variable,Term)

Mode and number of proofs:

occurs(@var,@term) - zero_or_one

subsumes/2

The first term subsumes the second term. Deprecated. Use the `subsumes_term/2` standard predicate instead.

Compilation flags:

static

Template:

subsumes(General,Specific)

Mode and number of proofs:

subsumes(@term,@term) - zero_or_one

subterm/2

The first term is a subterm of the second term.

Compilation flags:

static

Template:

subterm(Subterm,Term)

Mode and number of proofs:

subterm(?term,+term) - zero_or_more

valid/1

Term is valid.

Compilation flags:

static

Template:

valid(Term)

Mode and number of proofs:

valid(@nonvar) - zero_or_one

check/1

Checks if a term is valid. Throws an exception if the term is not valid.

Compilation flags:

static

Template:

check(Term)

Mode and number of proofs:

check(@nonvar) - one

variant/2

Each term is a variant of the other (i.e., they are structurally equivalent).

Compilation flags:

static

Template:

variant(Term1,Term2)

Mode and number of proofs:

variant(@term,@term) - zero_or_one

variables/2

Returns a list of all term variables (ordered as found when doing a depth-first, left-to-right traversal of Term). Deprecated. Use the standard term_variables/2 predicate instead.

Compilation flags:

static

Template:

variables(Term,List)

Mode and number of proofs:

variables(@term,-list) - one

singletons/2

Returns a list of all term singleton variables (ordered as found when doing a depth-first, left-to-right traversal of Term).

Compilation flags:

static

Template:

singletons(Term,Singletons)

Mode and number of proofs:

singletons(@term,-list) - one

`numbervars/3`

Grounds a term by replacing all variables with '\$VAR'(N) terms with N starting at From. The Next argument is unified with the next value for N after binding all variables.

Compilation flags:

`static`

Template:

`numbervars(Term,From,Next)`

Mode and number of proofs:

`numbervars(?term,+integer,?integer) - zero_or_one`

`numbervars/1`

Grounds a term by replacing all variables with '\$VAR'(N) terms with N starting at 0.

Compilation flags:

`static`

Template:

`numbervars(Term)`

Mode and number of proofs:

`numbervars(?term) - zero_or_one`

`varnumbers/3`

Replaces all '\$VAR'(N) sub-terms in a term with fresh variables for all values of N greater or equal to From. Variables in Term are shared with Copy.

Compilation flags:

`static`

Template:

varnumbers(Term,From,Copy)

Mode and number of proofs:

varnumbers(@term,+integer,?term) - zero_or_one

varnumbers/2

Replaces all '\$VAR'(N) sub-terms in a term with fresh variables for all values of N greater or equal to 0. Variables in Term are shared with Copy.

Compilation flags:

static

Template:

varnumbers(Term,Copy)

Mode and number of proofs:

varnumbers(@term,?term) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

[term](#)

[object](#)

1.71.21 type

Type checking predicates. User extensible. New types can be defined by adding clauses for the type/1 and check/2 multifile predicates.

Availability:

```
logtalk_load(types(loader))
```

Author: Paulo Moura

Version: 2:5:1

Date: 2024-09-26

Compilation flags:

```
static, context_switching_calls, complements(restrict)
```

Uses:

```
list
```

Remarks:

- Logtalk specific types: entity, object, protocol, category, entity_identifier, object_identifier, protocol_identifier, category_identifier, event, predicate.
- Prolog module related types (when the backend compiler supports modules): module, module_identifier, qualified_callable.
- Prolog base types: term, var, nonvar, atomic, atom, number, integer, float, compound, callable, ground.
- Atom derived types: non_quoted_atom, non_empty_atom, boolean, character, in_character, char, operator_specifier, hex_char.
- Atom derived parametric types: atom(CharSet), atom(CharSet,Length), non_empty_atom(CharSet), character(CharSet), in_character(CharSet), char(CharSet).
- Number derived types: positive_number, negative_number, non_positive_number, non_negative_number.
- Float derived types: positive_float, negative_float, non_positive_float, non_negative_float, probability.
- Integer derived types: positive_integer, negative_integer, non_positive_integer, non_negative_integer, byte, in_byte, character_code, in_character_code, code, operator_priority, hex_code.
- Integer derived parametric types: character_code(CharSet), in_character_code(CharSet), code(CharSet).
- List types (compound derived types): list, non_empty_list, partial_list, list_or_partial_list, list(Type), list(Type,Length), list(Type,Min,Max), list(Type,Length,Min,Max), non_empty_list(Type), codes, chars.
- Difference list types (compound derived types): difference_list, difference_list(Type).

- Other compound derived types: `compound(Name,Types)`, `predicate_indicator`, `non_terminal_indicator`, `predicate_or_non_terminal_indicator`, `clause`, `grammar_rule`, `pair`, `pair(KeyType,ValueType)`, `cyclic`, `acyclic`.
- Stream types: `stream`, `stream_or_alias`, `stream(Property)`, `stream_or_alias(Property)`.
- Other types: `Object::Closure`, `between(Type,Lower,Upper)`, `property(Type,LambdaExpression)`, `one_of(Type,Set)`, `var_or(Type)`, `ground(Type)`, `types(Types)`, `constrain(Type,Closure)`, `type`.
- Type predicate notes: This type is used to check for an object public predicate specified as `Object::Functor/Arity`.
- Type boolean notes: The two value of this type are the atoms `true` and `false`.
- Stream types notes: In the case of the `stream(Property)` and `stream_or_alias(Property)` types, `Property` must be a valid stream property.
- Type order notes: The three possible values of this type are the single character atoms `<`, `=`, and `>`.
- Type `character_code` notes: This type takes into account Unicode support by the backend compiler. When Unicode is supported, it distinguishes between BMP and full support. When Unicode is not supported, it assumes a byte representation for characters.
- Type `Object::Closure` notes: Allows calling a public object predicate for type-checking. The predicate should provide valid/2 predicate semantics and assume called with a bound argument. The `Closure` closure is extended with a single argument, the value to be checked.
- Type `compound(Name,Types)` notes: This type verifies that a compound term have the given `Name` and its arguments conform to `Types`.
- Type `between(Type, Lower, Upper)` notes: The type argument allows distinguishing between numbers and other types. It also allows choosing between mixed integer/float comparisons and strict float or integer comparisons. The term is type-checked before testing for interval membership.
- Type `property(Type, Lambda)` notes: Verifies that `Term` satisfies a property described using a lambda expression of the form `[Parameter]>>Goal`. The lambda expression is applied in the context of `user`. The term is type-checked before calling the goal.
- Type `one_of(Type, Set)` notes: For checking if a given term is an element of a set. The set is represented using a list. The term is type-checked before testing for set membership.
- Type `var_or(Type)` notes: Allows checking if a term is either a variable or a valid value of the given type.
- Type `ground(Type)` notes: Allows checking if a term is ground and a valid value of the given type.
- Type `types(Types)` notes: Allows checking if a term is a valid value for one of the types in a list of types.
- Type `constrain(Type,Closure)` notes: Allows checking if a term is a valid value for the given type and satisfies the given closure.
- Type `type` notes: Allows checking if a term is a valid type.
- Type `qualified_callable` notes: Allows checking if a term is a possibly module-qualified callable term. When the term is qualified, it also checks that the qualification modules are type correct. When the term is not qualified, its semantics are the same as the callable type.
- Design choices: The main predicates are `valid/2` and `check/3`. These are defined using the predicate `check/2`. Defining clauses for `check/2` instead of `valid/2` gives the user full control of exception terms without requiring an additional predicate.
- Error context: The built-in execution-context method `context/1` can be used to provide the calling context for errors when using the predicate `check/3`.

- Registering new types: New types can be registered by defining clauses for the `type/1` and `check/2` multifile predicates. Clauses for both predicates must have a bound first argument to avoid introducing spurious choice-points when type-checking terms.
- Meta-types: Meta-types are types that have one or more sub-type arguments. E.g. `var_or(Type)`. The sub-types of a meta-type can be enumerated by defining a clause for the `meta_type/3` multifile predicate.
- Character sets: When testing character or character code based terms (e.g., `atom`), it is possible to choose a character set (`ascii_identifier`, `ascii_printable`, `ascii_full`, `byte`, `unicode_bmp`, or `unicode_full`) using the parameterizable types.
- Caveats: The type argument (and any type parameterization) to the predicates is not type-checked (or checked for consistency) for performance reasons.
- Unicode limitations: Currently, correct character/code type-checking is only ensured for XVM and SWI-Prolog as other backends do not provide support for querying a Unicode code point category.

Inherited public predicates:

```
arbitrary/1 arbitrary/2 edge_case/2 get_seed/1 max_size/1 mutation/3 set_seed/1 shrink/3
shrink_sequence/3 shrinker/1
```

- Public predicates
 - `type/1`
 - `meta_type/3`
 - `valid/2`
 - `check/3`
 - `check/2`
- Protected predicates
- Private predicates
- Operators

Public predicates

`type/1`

Table of defined types. A new type can be registered by defining a clause for this predicate and adding a clause for the `check/2` multifile predicate.

Compilation flags:

```
static, multifile
```

Template:

```
type(Type)
```

Mode and number of proofs:

type(?callable) - zero_or_more

meta_type/3

Table of defined meta-types. A registered type that is a meta-type can be described by defining a clause for this predicate to enumerate its sub-types and optional values in case of a single sub-type.

Compilation flags:

static, multifile

Template:

meta_type(MetaType,SubTypes,Values)

Mode and number of proofs:

meta_type(?callable,-list,-list) - zero_or_more

valid/2

True if the given term is of the specified type. Fails otherwise.

Compilation flags:

static

Template:

valid(Type,Term)

Mode and number of proofs:

valid(@callable,@term) - zero_or_one

check/3

True if the given term is of the specified type. Throws an error otherwise using the format error(Error, Context). For the possible values of Error see the check/2 predicate.

Compilation flags:

static

Template:

```
check(Type,Term,Context)
```

Mode and number of proofs:

```
check(@callable,@term,@term) - one_or_error
```

check/2

True if the given term is of the specified type. Throws an error otherwise. A new type can be added by defining a clause for this predicate and registering it by adding a clause for the type/1 multifile predicate.

Compilation flags:

```
static, multifile
```

Template:

```
check(Type,Term)
```

Meta-predicate template:

```
check(:,*)
```

Mode and number of proofs:

```
check(@callable,@term) - one_or_error
```

Exceptions:

Term is not bound as required:

```
instantiation_error
```

Term is bound but not of the specified type:

```
type_error(Type,Term)
```

Term is the of the correct type but not in the specified domain:

```
domain_error(Domain,Term)
```

Term is the of the correct type and domain but the resource it represents does not exist:

```
existence_error(Type,Term)
```

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

arbitrary, os_types, either, maybe

object

1.71.22 varlist

List of variables predicates.

Availability:

logtalk_load(types(loader))

Author: Paulo Moura

Version: 2:0:0

Date: 2020-05-11

Compilation flags:

static, context_switching_calls

Implements:

public varlistp

Remarks:

(none)

Inherited public predicates:

append/3 check/1 delete/3 empty/1 flatten/2 last/2 length/2 memberchk/2 nextto/3 nth0/3
nth0/4 nth1/3 nth1/4 permutation/2 prefix/2 remove_duplicates/2 reverse/2 same_length/2
select/3 sublist/2 subtract/3 suffix/2 valid/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`list`, `list(Type)`, `numberlist`, `difflist`

`protocol`

1.71.23 varlistp

List of variables protocol.

Availability:

`logtalk_load(types(loader))`

Author: Paulo Moura

Version: 1:3:0

Date: 2022-09-19

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - append/3
 - delete/3
 - empty/1
 - flatten/2
 - last/2
 - length/2
 - memberchk/2
 - nextto/3
 - nth0/3
 - nth0/4
 - nth1/3
 - nth1/4
 - permutation/2
 - prefix/2
 - remove_duplicates/2
 - reverse/2
 - same_length/2
 - select/3
 - sublist/2
 - subtract/3
 - suffix/2
 - valid/1
 - check/1
- Protected predicates
- Private predicates
- Operators

Public predicates

append/3

Appends two lists.

Compilation flags:

static

Template:

append(List1,List2,List)

Mode and number of proofs:

append(?list,?list,?list) - zero_or_more

delete/3

Deletes from a list all occurrences of an element returning the list of remaining elements.

Compilation flags:

static

Template:

delete(List,Element,Remaining)

Mode and number of proofs:

delete(@list,@term,?list) - one

empty/1

True if the argument is an empty list.

Compilation flags:

static

Template:

empty(List)

Mode and number of proofs:

empty(@list) - zero_or_one

flatten/2

Flattens a list of lists into a list.

Compilation flags:

static

Template:

flatten(List,Flatted)

Mode and number of proofs:

flatten(@list,-list) - one

last/2

List last element (if it exists).

Compilation flags:

static

Template:

last(List,Last)

Mode and number of proofs:

last(@list,@var) - zero_or_one

length/2

List length.

Compilation flags:

static

Template:

length(List,Length)

Mode and number of proofs:

length(@list,?integer) - zero_or_one

memberchk/2

Checks if a variable is a member of a list.

Compilation flags:

static

Template:

memberchk(Element,List)

Mode and number of proofs:

memberchk(@var,@list) - zero_or_one

nextto/3

X and Y are consecutive elements in List.

Compilation flags:

static

Template:

nextto(X,Y,List)

Mode and number of proofs:

nextto(@var,@var,?list) - zero_or_more

nth0/3

Nth element of a list (counting from zero).

Compilation flags:

static

Template:

nth0(Nth,List,Element)

Mode and number of proofs:

nth0(?integer,+list,@var) - zero_or_more

`nth0/4`

Nth element of a list (counting from zero). Rest is a list of all the other elements. Can be used to either select the nth element of List or to insert an element before the nth element in Rest.

Compilation flags:

`static`

Template:

`nth0(Nth,List,Element,Rest)`

Mode and number of proofs:

`nth0(?integer,+list,@var,?list) - zero_or_more`

`nth1/3`

Nth element of a list (counting from one).

Compilation flags:

`static`

Template:

`nth1(Nth,List,Element)`

Mode and number of proofs:

`nth1(?integer,+list,@var) - zero_or_more`

`nth1/4`

Nth element of a list (counting from zero). Rest is a list of all the other elements. Can be used to either select the nth element of List or to insert an element before the nth element in Rest.

Compilation flags:

`static`

Template:

`nth1(Nth,List,Element,Rest)`

Mode and number of proofs:

`nth1(?integer,+list,@var,?list) - zero_or_more`

permutation/2

The two lists are a permutation of the same list.

Compilation flags:

static

Template:

permutation(List,Permutation)

Mode and number of proofs:

permutation(@list,@list) - zero_or_one

prefix/2

Prefix is a prefix of List.

Compilation flags:

static

Template:

prefix(Prefix,List)

Mode and number of proofs:

prefix(?list,@list) - zero_or_more

remove_duplicates/2

Removes duplicated variables and keeping the left-most variable when repeated.

Compilation flags:

static

Template:

remove_duplicates(List,Set)

Mode and number of proofs:

`remove_duplicates(+list,-list) - one`

`reverse/2`

Reverses a list.

Compilation flags:

`static`

Template:

`reverse(List,Reversed)`

Mode and number of proofs:

`reverse(@list,?list) - zero_or_one`

`reverse(?list,@list) - zero_or_one`

`reverse(-list,-list) - one_or_more`

`same_length/2`

The two lists have the same length.

Compilation flags:

`static`

Template:

`same_length(List1,List2)`

Mode and number of proofs:

`same_length(@list,?list) - zero_or_one`

`same_length(?list,@list) - zero_or_one`

`same_length(-list,-list) - one_or_more`

select/3

Selects an element from a list, returning the list of remaining elements.

Compilation flags:

static

Template:

select(Element,List,Remaining)

Mode and number of proofs:

select(@var,?list,?list) - zero_or_more

sublist/2

The first list is a sublist of the second.

Compilation flags:

static

Template:

sublist(Sublist,List)

Mode and number of proofs:

sublist(?list,@list) - zero_or_more

subtract/3

Removes all elements in the second list from the first list, returning the list of remaining elements.

Compilation flags:

static

Template:

subtract(List,Elements,Remaining)

Mode and number of proofs:

subtract(@list,@list,-list) - one

suffix/2

Suffix is a suffix of List.

Compilation flags:

static

Template:

suffix(Suffix,List)

Mode and number of proofs:

suffix(?list,@list) - zero_or_more

valid/1

Term is a valid list of variables.

Compilation flags:

static

Template:

valid(Term)

Mode and number of proofs:

valid(@nonvar) - zero_or_one

check/1

Checks if a term is a valid list of variables. Throws an exception if the term is not valid.

Compilation flags:

static

Template:

check(Term)

Mode and number of proofs:

check(@nonvar) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`varlist`, `listp`, `numberlistp`

1.72 ulid

object

1.72.1 ulid

Universally Unique Lexicographically Sortable Identifier (ULID) generator using an atom representation.

Availability:

```
logtalk_load(ulid(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-05-19

Compilation flags:

```
static, context_switching_calls
```

Extends:

```
public ulid(atom)
```

Remarks:

(none)

Inherited public predicates:

```
generate/1 generate/2 generate/8 timestamp/2 timestamp/8
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`ulid(Representation)`, `ulid_types`, `uuid`, `uuid(Representation)`, `ids`, `ids(Representation,Bytes)`
object

1.72.2 `ulid(Representation)`

- Representation - Text representation for the ULID. Possible values are atom, chars, and codes.

Universally Unique Lexicographically Sortable Identifier (ULID) generator.

Availability:

```
logtalk_load(ulid(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-05-19

Compilation flags:

```
static, context_switching_calls
```

Implements:

public ulid_protocol

Uses:

fast_random
iso8601
list
os

Remarks:

(none)

Inherited public predicates:

generate/1 generate/2 generate/8 timestamp/2 timestamp/8

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

ulid, ulid_types, uuid(Representation), uuid, ids, ids(Representation,Bytes)

protocol

1.72.3 ulid_protocol

Universally Unique Lexicographically Sortable Identifier (ULID) generator protocol.

Availability:

```
logtalk_load(ulid(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-05-17

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - generate/1
 - generate/2
 - generate/8
 - timestamp/2
 - timestamp/8
- Protected predicates
- Private predicates
- Operators

Public predicates

generate/1

Generates a new ULID.

Compilation flags:
static

Template:
generate(ULID)
Mode and number of proofs:
generate(--ulid) - one

generate/2

Generates a new ULID from a timestamp (number of milliseconds since the Unix epoch: 00:00:00 UTC on January 1, 1970).

Compilation flags:
static

Template:
generate(Milliseconds,ULID)
Mode and number of proofs:
generate(+integer,--ulid) - one

generate/8

Generates a new ULID from a timestamp discrete components.

Compilation flags:
static

Template:
generate(Year,Month,Day,Hours,Minutes,Seconds,Milliseconds,ULID)
Mode and number of proofs:

`generate(+integer,+integer,+integer,+integer,+integer,+integer,+integer,--ulid) - one`

`timestamp/2`

Returns the given ULID timestamp (number of milliseconds since the Unix epoch: 00:00:00 UTC on January 1, 1970).

Compilation flags:

`static`

Template:

`timestamp(ULID,Milliseconds)`

Mode and number of proofs:

`timestamp(++ulid,-integer) - one`

`timestamp/8`

Decodes a ULID into its timestamp discrete components.

Compilation flags:

`static`

Template:

`timestamp(ULID,Year,Month,Day,Hours,Minutes,Seconds,Milliseconds)`

Mode and number of proofs:

`timestamp(++ulid,-integer,-integer,-integer,-integer,-integer,-integer,-integer) - one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

category

1.72.4 ulid_types

ULID type definition.

Availability:

```
logtalk_load(ulid(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2023-05-19

Compilation flags:

```
static
```

Provides:

```
type::type/1
```

```
type::check/2
```

Uses:

```
list
```

```
type
```

Remarks:

- **Provided types:** This category adds a `ulid(Representation)` type for type-checking when using the `ulid` library object. Valid representation values are `atom`, `chars`, and `codes`.

Inherited public predicates:

(none)

- [Public predicates](#)
- [Protected predicates](#)

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`ulid(Representation)`, `ulid`

1.73 union_find

object

1.73.1 union_find

Union find data structure implementation.

Availability:

`logtalk_load(union_find(loader))`

Author: José Antonio Rianza Valverde; adapted to Logtalk by Paulo Moura

Version: 1:0:0

Date: 2022-02-18

Compilation flags:

`static`, `context_switching_calls`

Implements:

`public union_find_protocol`

Extends:

public compound

Uses:

avltree

Remarks:

(none)

Inherited public predicates:

(<)/2 (=:=)/2 (=<)/2 (=\\=)/2 (>)/2 (>=)/2 check/1 depth/2 disjoint_sets/2 find/4
 find/5 ground/1 make_set/3 new/1 new/2 numbervars/1 numbervars/3 occurs/2 singletons/2
 subsumes/2 subterm/2 union/4 union_all/3 valid/1 variables/2 variant/2 varnumbers/2
 varnumbers/3

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.73.2 union_find_protocol

Union-find data structure protocol.

Availability:

```
logtalk_load(union_find(loader))
```

Author: José Antonio Riaza Valverde; adapted to Logtalk by Paulo Moura

Version: 1:0:0

Date: 2022-02-17

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - new/2
 - make_set/3
 - union/4
 - union_all/3
 - find/4
 - find/5
 - disjoint_sets/2
- Protected predicates
- Private predicates
- Operators

Public predicates

`new/2`

Creates a new union-find data structure with a list of elements as keys.

Compilation flags:

`static`

Template:

`new(Elements,UnionFind)`

Mode and number of proofs:

`new(+list(element),?union_find) - zero_or_one`

`make_set/3`

Makes a new set by creating a new element with a unique key `Element`, a rank of 0, and a parent pointer to itself. The parent pointer to itself indicates that the element is the representative member of its own set.

Compilation flags:

`static`

Template:

`make_set(UnionFind,Element,NewUnionFind)`

Mode and number of proofs:

`make_set(+union_find,+element,?union_find) - zero_or_one`

`union/4`

Merges the two trees, if distinct, that contain the given elements. The trees are joined by attaching the shorter tree (by rank) to the root of the taller tree. Fails if any of the elements is not found.

Compilation flags:

`static`

Template:

`union(UnionFind,Element1,Element2,NewUnionFind)`

Mode and number of proofs:

`union(+union_find,+element,+element,?union_find) - zero_or_one`

`union_all/3`

Merges the distinct trees for all the given elements returning the resulting union-find data structure. Fails if any of the elements is not found.

Compilation flags:

`static`

Template:

`union_all(UnionFind,Elements,NewUnionFind)`

Mode and number of proofs:

`union_all(+union_find,+list(element),?union_find) - zero_or_one`

`find/4`

Finds the root element of a set by following the chain of parent pointers from the given element. Root is the representative member of the set to which the element belongs, and may be element itself. Fails if the element is not found.

Compilation flags:

`static`

Template:

`find(UnionFind,Element,Root,NewUnionFind)`

Mode and number of proofs:

`find(+union_find,+element,?element,?union_find) - zero_or_one`

Remarks:

- Path compression: The structure of the tree containing the element is flattened by making every node point to the root whenever this predicate is used on it.
-

find/5

Same as the find/4 predicate, but returning also the rank of the root. Fails if the element is not found.

Compilation flags:

static

Template:

find(UnionFind,Element,Root,Rank,UnionFindOut)

Mode and number of proofs:

find(+union_find,+element,?element,?rank,?union_find) - zero_or_one

Remarks:

- Path compression: The structure of the tree containing the element is flattened by making every node point to the root whenever this predicate is used on it.
-

disjoint_sets/2

Returns the list of disjoint sets in the given union-find data structure.

Compilation flags:

static

Template:

disjoint_sets(UnionFind,Sets)

Mode and number of proofs:

disjoint_sets(+union_find,?sets) - zero_or_one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`union_find`

1.74 uuid

object

1.74.1 uuid

Universally unique identifier (UUID) generator using an atom representation.

Availability:

`logtalk_load(uuid(loader))`

Author: Paulo Moura

Version: 0:2:0

Date: 2022-11-23

Compilation flags:

`static, context_switching_calls`

Extends:

`public uuid(atom)`

Remarks:

(none)

Inherited public predicates:

`random_node/1 uuid_null/1 uuid_v1/2 uuid_v4/1`

- [Public predicates](#)
- [Protected predicates](#)

- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

`uuid(Representation)`, `ulid`, `ulid(Representation)`, `ids`, `ids(Representation,Bytes)`

object

1.74.2 `uuid(Representation)`

- Representation - Text representation for the UUID. Possible values are atom, chars, and codes.

Universally unique identifier (UUID) generator.

Availability:

```
logtalk_load(uuid(loader))
```

Author: Paulo Moura

Version: 0:5:0

Date: 2022-11-23

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public uuid_protocol
```

Uses:

```
fast_random
```

iso8601
list
os

Remarks:
(none)

Inherited public predicates:
random_node/1 uuid_null/1 uuid_v1/2 uuid_v4/1

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

See also:

uuid, ulid, ulid(Representation), ids, ids(Representation,Bytes)

protocol

1.74.3 uuid_protocol

Universally unique identifier (UUID) generator protocol.

Availability:

```
logtalk_load(uuid(loader))
```

Author: Paulo Moura

Version: 0:3:0

Date: 2021-03-13

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - `uuid_v1/2`
 - `uuid_v4/1`
 - `uuid_null/1`
 - `random_node/1`
- Protected predicates
- Private predicates
- Operators

Public predicates

`uuid_v1/2`

Returns a version 1 UUID for the given MAC address (a list of six bytes). The MAC address can be replaced by a random 6 bytes node identifier as per RFC 4122 when the MAC address is not available or should not be disclosed.

Compilation flags:

`static`

Template:

`uuid_v1(MAC,UUID)`

Mode and number of proofs:

`uuid_v1(+list(byte),--ground) - one`

`uuid_v4/1`

Returns a version 4 UUID.

Compilation flags:

`static`

Template:

`uuid_v4(UUID)`

Mode and number of proofs:

`uuid_v4(--ground) - one`

`uuid_null/1`

Returns the null UUID.

Compilation flags:

`static`

Template:

`uuid_null(UUID)`

Mode and number of proofs:

uuid_null(--ground) - one

random_node/1

Generates a list with six random bytes that can be used in alternative to a MAC address when generating version 1 UUIDs.

Compilation flags:

static

Template:

random_node(Node)

Mode and number of proofs:

random_node(--list(byte)) - one

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

1.75 verdi_neruda

object

1.75.1 a_star_interpreter(W)

A* interpreter for general logic programs. The parameter W is used to fine tune the behavior. W = 0 gives us a breadth-first search and W = 1 gives us a greedy best-first search. The default value for W is 0.5.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static, context_switching_calls
```

Imports:

```
public best_first
```

Remarks:

```
(none)
```

Inherited public predicates:

```
prove/2 prove/3
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.2 benchmark_generators

Generates random data structures for use in benchmarks.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static, context_switching_calls
```

Uses:

```
random
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - random_tree/1
- Protected predicates
- Private predicates

- Operators

Public predicates

`random_tree/1`

Generates a random tree.

Compilation flags:

`static`

Template:

`random_tree(Tree)`

Mode and number of proofs:

`random_tree(-tree) - one`

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.75.3 `best_first`

Best-first framework for general logic programs.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Victor Lagerkvist

Version: 1:1:0

Date: 2019-03-08

Compilation flags:

static

Implements:

public interpreterp

Uses:

counter

minheap

Remarks:

(none)

Inherited public predicates:

prove/2 prove/3

- Public predicates
- Protected predicates
 - f/4
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

f/4

.

Compilation flags:

static

Template:

f(Length1,Length2,Depth,Cost)

Mode and number of proofs:

f(+float,+float,+float,-float) - zero_or_more

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.4 bfs_interpreter

Breadth-first interpreter for general logic programs.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

`static, context_switching_calls`

Implements:

`public interpreterp`

Uses:

`counter`

`queue`

Remarks:

(none)

Inherited public predicates:

`prove/2 prove/3`

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.5 bup_interpreter

Semi-naive bottom-up interpreter for general (stratified) logic programs. Magic transformation is realized through an expansion hook.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Ulf Nilsson. Ported to Logtalk and augmented with negation by Victor Lagerkvist.

Version: 1:1:3

Date: 2023-11-30

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public interpreterp
```

Uses:

```
counter
```

```
list
```

```
magic
```

```
term
```

Remarks:

```
(none)
```

Inherited public predicates:

prove/2 prove/3

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.6 counter

Counter implemented with asserta/retract.

Availability:

logtalk_load(verdi_neruda(loader))

Author: Victor Lagerkvist

Version: 1:0:1

Date: 2022-10-08

Compilation flags:

static, context_switching_calls

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - increment/0
 - increase/1
 - set/1
 - value/1
 - reset/0
- Protected predicates
- Private predicates
 - c/1
- Operators

Public predicates

increment/0

Increment the counter by 1.

Compilation flags:

static

Mode and number of proofs:

increment - one

increase/1

Increments the counter by the specified amount.

Compilation flags:

static

Template:

increase(I)

Mode and number of proofs:

increase(+number) - one

set/1

Sets the counter to the specified amount.

Compilation flags:

static

Template:

set(N)

Mode and number of proofs:

set(+number) - one

value/1

Gets the current value of the counter.

Compilation flags:

static

Template:

value(N)

Mode and number of proofs:

value(?number) - one

reset/0

Resets the counter to zero.

Compilation flags:

static

Mode and number of proofs:

reset - one

Protected predicates

(none)

Private predicates

c/1

Stores the current value of the counter.

Compilation flags:

dynamic

Template:

c(N)

Mode and number of proofs:

c(?number) - zero_or_one

Operators

(none)

protocol

1.75.7 databasep

Database protocol.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

```
(none)
```

Inherited public predicates:

```
(none)
```

- Public predicates
 - rule/4
 - rule/3
 - rule/2
 - bench_goal/1
- Protected predicates
- Private predicates
- Operators

Public predicates

rule/4

Clauses for this predicate are automatically generated using term-expansion. The third argument contains the length of Body.

Compilation flags:

static

Template:

rule(Head,Body,Length,Tail)

Mode and number of proofs:

rule(?callable,?callable,-,-) - zero_or_more

rule/3

Clauses for this predicate are automatically generated using term-expansion. The third argument denotes the tail of the Body.

Compilation flags:

static

Template:

rule(Head,Body,Tail)

Mode and number of proofs:

rule(?callable,?callable,-) - zero_or_more

rule/2

Clauses for this predicate are automatically generated using term-expansion.

Compilation flags:

static

Template:

rule(Head,Body)

Mode and number of proofs:

rule(?callable,-list(callable)) - zero_or_more

bench_goal/1

Table of benchmark goals. They are used from shell.lgt to make benchmarking easier.

Compilation flags:

static

Template:

bench_goal(Goal)

Mode and number of proofs:

bench_goal(?callable) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.75.8 debug_expansion(Mode)

Expands debug/1 calls. The parameter Mode can be either the atom “debug” or “production”.

Availability:

logtalk_load(verdi_neruda(loader))

Author: Paulo Moura

Version: 1:0:0

Date: 2010-04-15

Compilation flags:

static, context_switching_calls

Implements:

public expanding

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.9 demodb

Availability:

`logtalk_load(verdi_neruda(loader))`

Compilation flags:

`static, context_switching_calls`

Implements:

public `databasep`

Remarks:

(none)

Inherited public predicates:

`bench_goal/1 rule/2 rule/3 rule/4`

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.10 dfs_interpreter

Depth-first interpreter for general logic programs.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

`static, context_switching_calls`

Implements:

`public interpreterp`

Uses:

`counter`

Remarks:

(none)

Inherited public predicates:

`prove/2 prove/3`

- [Public predicates](#)
- [Protected predicates](#)
- [Private predicates](#)
- [Operators](#)

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

category

1.75.11 flattening

Flattens conjunction of goals with the form `f and g` into a list `[f,g]`.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static
```

source: Based on source code from *The Craft of Prolog*, by Richard O'Keefe.

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
- Protected predicates
 - flatten_goals//1
- Private predicates
- Operators

Public predicates

(none)

Protected predicates

flatten_goals//1

Flattens a conjunction of goals.

Compilation flags:

static

Template:

flatten_goals(Conjunction)

Mode and number of proofs:

flatten_goals(+callable) - one

Private predicates

(none)

Operators

(none)

object

1.75.12 heuristic_expansion(Mode)

Expands rules of the form `p if f and g` to `rule(p, [f,g|Tail], Length, Tail)`.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:2

Date: 2022-10-08

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Extends:

```
public rule_expansion(Mode)
```

Uses:

```
list
```

Remarks:

```
(none)
```

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.13 iddfs_interpreter(Increment)

Iterative deepening depth-first interpreter for general logic programs. Based on source code from The Craft of Prolog, by Richard O'Keefe. The default value for the increment is 1.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public interpreterp
```

Uses:

```
counter
```

```
dfs_interpreter
```

Remarks:

```
(none)
```

Inherited public predicates:

```
prove/2 prove/3
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

protocol

1.75.14 interpreterp

Protocol for an interpreter.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

```
static
```

Dependencies:

```
(none)
```

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - prove/2
 - prove/3
- Protected predicates
- Private predicates
- Operators

Public predicates

prove/2

True if goal is provable in the specified database.

Compilation flags:

static

Template:

prove(Goal,DB)

Mode and number of proofs:

prove(+goal,+database) - zero_or_more

prove/3

True if goal is provable within the given depth-limit in the specified database.

Compilation flags:

static

Template:

prove(Goal,Limit,DB)

Mode and number of proofs:

prove(+goal,+limit,+database) - zero_or_more

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

object

1.75.15 magic

Object encapsulating magic methods.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Ulf Nilsson. Ported to Logtalk and augmented with stratified negation by Victor Lagerkvist.

Version: 1:0:0

Date: 2010-06-13

Compilation flags:

`static, context_switching_calls`

Uses:

`list`

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)
 - [magicise/4](#)

– magic/2

- Protected predicates
- Private predicates
- Operators

Public predicates

magicise/4

Transform (Head :- Body) into a magic clause (NewHead :- NewBody).

Compilation flags:

static

Template:

magicise(Head,Body,NewHead,NewBody)

Mode and number of proofs:

magicise(+term,+list,-term,-list) - zero_or_one

magic/2

Prefix the predicate symbol of Old with magic.

Compilation flags:

static

Template:

magic(Old,New)

Mode and number of proofs:

magic(+callable,-callable) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.16 magic_expansion(Mode)

Expands rules of the form `p if f and g` to the more manageable rule(`p, [f,g]`) and performs magic transformation of clauses.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Victor Lagerkvist

Version: 1:0:2

Date: 2022-10-08

Compilation flags:

`static, context_switching_calls`

Implements:

`public expanding`

Imports:

`public flattening`

Extends:

`public debug_expansion(Mode)`

Uses:

`list`

`magic`

Remarks:

(none)

Inherited public predicates:

`goal_expansion/2 term_expansion/2`

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.17 rule_expansion(Mode)

Expands rules of the form p if f and g to the more manageable rule(p , [f,g]).

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Victor Lagerkvist

Version: 1:0:2

Date: 2022-10-08

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Imports:

```
public flattening
```

Extends:

```
public debug_expansion(Mode)
```

Remarks:

(none)

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.18 shell

User frontend to start the application.

Availability:

```
logtalk_load(verdi_neruda(loader))
```

Author: Paulo Moura

Version: 1:0:0

Date: 2019-03-20

Compilation flags:

static, context_switching_calls

Uses:

shell(Interpreters)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - welcome/0
 - start/0
- Protected predicates
- Private predicates
- Operators

Public predicates

welcome/0

Compilation flags:

static

start/0

Compilation flags:

static

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

object

1.75.19 shell(Interpreters)

Prolog shell for the interpreters.

Availability:

`logtalk_load(verdi_neruda(loader))`

Author: Victor Lagerkvist and Paulo Moura

Version: 1:1:3

Date: 2024-03-15

Compilation flags:

`static, context_switching_calls`

Uses:

`counter`

`list`

`meta`

`pairs`

Remarks:

(none)

Inherited public predicates:

(none)

- [Public predicates](#)

- [init/0](#)

- Protected predicates
- Private predicates
- Operators

Public predicates

init/0

Compilation flags:
static

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)
object

1.75.20 shell_expansion(Mode)

Expansion object for the shell.

Availability:
logtalk_load(verdi_neruda(loader))

Author: Victor Lagerkvist
Version: 1:0:1
Date: 2022-10-08

Compilation flags:
static, context_switching_calls

Implements:

public expanding

Extends:

public rule_expansion(Mode)

Remarks:

(none)

Inherited public predicates:

goal_expansion/2 term_expansion/2

- Public predicates
- Protected predicates
- Private predicates
- Operators

Public predicates

(no local declarations; see entity ancestors if any)

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

1.76 wrapper

object

1.76.1 wrapper

Adviser tool for porting and wrapping plain Prolog applications.

Availability:

```
logtalk_load(wrapper(loader))
```

Author: Paulo Moura

Version: 0:12:2

Date: 2024-05-10

Compilation flags:

```
static, context_switching_calls
```

Implements:

```
public expanding
```

Provides:

```
logtalk::message_hook/4
```

```
logtalk::message_prefix_stream/4
```

```
logtalk::message_tokens//2
```

Uses:

```
logtalk
```

```
os
```

Remarks:

- `prolog_extensions(Extensions)` option: List of file name extensions used to recognize Prolog source files (default is `['.pl', '.pro', '.prolog']`).
- `logtalk_extension(Extension)` option: Logtalk file name extension to be used for the generated wrapper files (default is `'.lgt'`).
- `exclude_files(Files)` option: List of Prolog source files names to exclude (default is `[]`).
- `exclude_directories(Files)` option: List of sub-directory names to exclude (default is `[]`).
- `include_wrapped_files(Boolean)`: Generate `include/1` directives for the wrapped Prolog source files (default is `true`).

Inherited public predicates:

```
goal_expansion/2 term_expansion/2
```

- Public predicates
 - `rdirectory/2`

- rdirectory/1
- directory/2
- directory/1
- directories/2
- directories/1
- files/2
- files/1
- file/2
- file/1
- save/1
- save/0
- default_option/1
- default_options/1
- Protected predicates
- Private predicates
 - merge_options/2
 - predicate_called_but_not_defined_/2
 - object_predicate_called_/3
 - module_predicate_called_/3
 - unknown_predicate_called_/2
 - missing_predicate_directive_/3
 - non_standard_predicate_call_/2
 - dynamic_directive_/3
 - multifile_directive_/3
 - add_directive_before_entity_/2
 - add_directive_/2
 - add_directive_/3
 - remove_directive_/2
 - file_being_advised_/4
- Operators

Public predicates

`rdirectory/2`

Advises the user on missing directives for converting all plain Prolog files in a directory and its sub-directories to Logtalk objects using the specified options.

Compilation flags:

`static`

Template:

`rdirectory(Directory,Options)`

Mode and number of proofs:

`rdirectory(+atom,+list(compound)) - one`

`rdirectory/1`

Advises the user on missing directives for converting all plain Prolog files in a directory and its sub-directories to Logtalk objects using default options.

Compilation flags:

`static`

Template:

`rdirectory(Directory)`

Mode and number of proofs:

`rdirectory(+atom) - one`

`directory/2`

Advises the user on missing directives for converting all plain Prolog files in a directory to Logtalk objects using the specified options.

Compilation flags:

`static`

Template:

directory(Directory,Options)

Mode and number of proofs:

directory(+atom,+list(compound)) - one

directory/1

Advises the user on missing directives for converting all plain Prolog files in a directory to Logtalk objects using default options.

Compilation flags:

static

Template:

directory(Directory)

Mode and number of proofs:

directory(+atom) - one

directories/2

Advises the user on missing directives for converting all Prolog files in a set of directories to Logtalk objects using the specified options.

Compilation flags:

static

Template:

directories(Directories,Options)

Mode and number of proofs:

directories(+list(atom),+list(compound)) - one

directories/1

Advises the user on missing directives for converting all Prolog files in a set of directories to Logtalk objects using default options.

Compilation flags:

static

Template:

directories(Directories)

Mode and number of proofs:

directories(+list(atom)) - one

files/2

Advises the user on missing directives for converting a list of plain Prolog files to Logtalk objects using the specified options.

Compilation flags:

static

Template:

files(Files,Options)

Mode and number of proofs:

files(+list(atom),+list(compound)) - one

files/1

Advises the user on missing directives for converting a list of plain Prolog files to Logtalk objects using default options.

Compilation flags:

static

Template:

files(Files)

Mode and number of proofs:

files(+list(atom)) - one

file/2

Advises the user on missing directives for converting a plain Prolog file to Logtalk objects using the specified options.

Compilation flags:

static

Template:

file(File,Options)

Mode and number of proofs:

file(+atom,+list(compound)) - one

file/1

Advises the user on missing directives for converting a plain Prolog file to Logtalk objects using default options.

Compilation flags:

static

Template:

file(File)

Mode and number of proofs:

file(+atom) - one

save/1

Saves the generated wrapper objects (plus a loader file per directory) for all advised files using the specified options. The wrapper objects are saved to the same directories that contain the wrapped Prolog files.

Compilation flags:

static

Template:

save(Options)

Mode and number of proofs:

save(+list(compound)) - one

save/0

Saves the generated wrapper objects (plus a loader file per directory) for all advised files using default options. The wrapper objects are saved to the same directories that contain the wrapped Prolog files.

Compilation flags:

static

Mode and number of proofs:

save - one

default_option/1

Enumerates by backtracking the default options used when generating the wrapper objects.

Compilation flags:

static

Template:

default_option(DefaultOption)

Mode and number of proofs:

default_option(?compound) - zero_or_more

default_options/1

Returns a list of the default options used when generating the wrapper objects.

Compilation flags:

static

Template:

default_options(DefaultOptions)

Mode and number of proofs:

default_options(-list(compound)) - one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

merge_options/2

Merges the user options with the default options, returning the list of options used when generating the wrapper objects.

Compilation flags:

static

Template:

merge_options(UserOptions,Options)

Mode and number of proofs:

merge_options(+list(compound),-list(compound)) - one

predicate_called_but_not_defined_/2

Table of called object predicates that are not locally defined.

Compilation flags:

dynamic

Template:

predicate_called_but_not_defined_(Object,Predicate)

Mode and number of proofs:

predicate_called_but_not_defined_(?atom,?predicate_indicator) - zero_or_more

object_predicate_called_/3

Table of called object predicates.

Compilation flags:

dynamic

Template:

object_predicate_called_(Object,Other,Predicate)

Mode and number of proofs:

object_predicate_called_(?atom,?atom,?predicate_indicator) - zero_or_more

module_predicate_called_/3

Table of called module predicates.

Compilation flags:

dynamic

Template:

module_predicate_called_(Object,Module,Predicate)

Mode and number of proofs:

module_predicate_called_(?atom,?atom,?predicate_indicator) - zero_or_more

unknown_predicate_called_/2

Table of predicates called but not defined.

Compilation flags:

dynamic

Template:

unknown_predicate_called_(Object,Predicate)

Mode and number of proofs:

unknown_predicate_called_(?atom,?predicate_indicator) - zero_or_more

missing_predicate_directive_/3

Table of missing predicate directives.

Compilation flags:

dynamic

Template:

missing_predicate_directive_(Object,Directive,Predicate)

Mode and number of proofs:

missing_predicate_directive_(?atom,?predicate_indicator,?predicate_indicator) - zero_or_more

non_standard_predicate_call_/2

Table of called non-standard predicates.

Compilation flags:

dynamic

Template:

non_standard_predicate_call_(Object,Predicate)

Mode and number of proofs:

non_standard_predicate_call_(?atom,?predicate_indicator) - zero_or_more

dynamic_directive_/3

Table of declared dynamic predicates.

Compilation flags:

dynamic

Template:

dynamic_directive_(Object,Line,Predicate)

Mode and number of proofs:

dynamic_directive_(?atom,?integer,?predicate_indicator) - zero_or_more

multifile_directive_/3

Table of declared multifile predicates.

Compilation flags:

dynamic

Template:

multifile_directive_(Object,Line,Predicate)

Mode and number of proofs:

multifile_directive_(?atom,?integer,?predicate_indicator) - zero_or_more

add_directive_before_entity_/2

Table of directives to be added before the entity opening directive.

Compilation flags:

dynamic

Template:

add_directive_before_entity_(Object,Directive)

Mode and number of proofs:

add_directive_before_entity_(?atom,?predicate_indicator) - zero_or_more

add_directive_/2

Table of directives to be added.

Compilation flags:

dynamic

Template:

add_directive_(Object,Directive)

Mode and number of proofs:

add_directive_(?atom,?predicate_indicator) - zero_or_more

add_directive_/3

Table of directives to be added to complement existing directives.

Compilation flags:

dynamic

Template:

add_directive_(Object,Directive,NewDirective)

Mode and number of proofs:

add_directive_(?atom,?predicate_indicator,?predicate_indicator) - zero_or_more

remove_directive_/2

Table of directives to be removed.

Compilation flags:

dynamic

Template:

remove_directive_(Object,Directive)

Mode and number of proofs:

remove_directive_(?atom,?predicate_indicator) - zero_or_more

file_being_advised_/4

Table of files being advised are respective directories and names (basename without extension).

Compilation flags:

dynamic

Template:

file_being_advised_(File,Path,Directory,Name)

Mode and number of proofs:

file_being_advised_(?atom,?atom,?atom,?atom) - zero_or_more

Operators

(none)

1.77 xml_parser

object

1.77.1 xml

Bi-directional XML parser.

Availability:

logtalk_load(xml_parser(loader))

Author: John Fletcher; adapted to Logtalk by Paulo Moura.

Version: 3:8:4

Date: 2024-03-14

Copyright: Copyright (C) 2001-2005 Binding Time Limited, Copyright (C) 2005-2013 John Fletcher

License: This program is offered free of charge, as unsupported source code. You may use it, copy it, distribute it, modify it or sell it without restriction, but entirely at your own risk.

Compilation flags:

static, context_switching_calls

Uses:

list
term

Remarks:

- On-line documentation: https://binding-time.co.uk/index.php/Parsing_XML_with_Prolog
- Compliance: This XML parser supports a subset of XML suitable for XML Data and Worldwide Web applications. It is neither as strict nor as comprehensive as the XML 1.0 Specification mandates.
- Compliance-strictness: It is not as strict, because, while the specification must eliminate ambiguities, not all errors need to be regarded as faults, and some reasonable examples of real XML usage would have to be rejected if they were.
- Compliance-comprehensive: It is not as comprehensive, because, where the XML specification makes provision for more or less complete DTDs to be provided as part of a document, xml.pl actions the local definition of ENTITIES only. Other DTD extensions are treated as commentary.
- Bi-directional conversions: Conversions are not fully symmetrical as weaker XML is accepted than can be generated. Notably, in-bound (Codes -> Document) parsing does not require strictly well-formed XML. If Codes does not represent well-formed XML, Document is instantiated to the term malformed(<attributes>,<content>).

Inherited public predicates:

(none)

- Public predicates
 - parse/2
 - parse/3
 - subterm/2
 - pp/1
- Protected predicates
- Private predicates
 - xml_to_document/3
 - empty_map/1
 - map_member/3
 - map_store/4
 - pp_string/1
 - fault/5
 - exception/4
 - document_generation//2
 - pcd_data_7bit//1
 - character_data_format/3

```

- cdata_generation//1

```

- Operators

Public predicates

parse/2

Parses a list of character codes to/from a data structure of the form `xml(<atts>,<content>)`.

Compilation flags:

static

Template:

```
parse(Codes,Document)
```

Mode and number of proofs:

```
parse(+list(character_code),?nonvar) - zero_or_one
```

```
parse(?list(character_code),+nonvar) - zero_or_one
```

parse/3

Parses a list of character codes to/from a data structure of the form `xml(<atts>,<content>)` using the given list of options.

Compilation flags:

static

Template:

```
parse(Options,Codes,Document)
```

Mode and number of proofs:

```
parse(++list(compound),+list(character_code),?nonvar) - zero_or_one
```

```
parse(++list(compound),?list(character_code),+nonvar) - zero_or_one
```

Remarks:

- `extended_characters(Boolean)` option: Use the extended character entities for XHTML (default true).
- `format(Boolean)` option: For parsing, strip layouts when no character data appears between elements (default true). For generating, indent the element content (default true).
- `remove_attribute_prefixes(Boolean)` option: Remove namespace prefixes from attributes when it's the same as the prefix of the parent element (default false).

- `allow_ampersand(Boolean)` option: Allow unescaped ampersand characters (&) to occur in PCDATA (default false).
-

subterm/2

Unifies Subterm with a sub-term of XMLTerm. Note that XMLTerm is a sub-term of itself.

Compilation flags:

static

Template:

subterm(XMLTerm,Subterm)

Mode and number of proofs:

subterm(+nonvar,?nonvar) - zero_or_one

pp/1

Pretty prints a XML document on the current output stream.

Compilation flags:

static

Template:

pp(XMLDocument)

Mode and number of proofs:

pp(+nonvar) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

xml_to_document/3

Translates the list of character codes XML into the Prolog term Document. Options is a list of terms controlling the treatment of layout characters and character entities.

Compilation flags:

static

Template:

xml_to_document(Options,XML,Document)

Mode and number of proofs:

xml_to_document(+nonvar,+nonvar,?nonvar) - zero_or_one

empty_map/1

True if Map is a null map.

Compilation flags:

static

Template:

empty_map(Map)

Mode and number of proofs:

empty_map(?nonvar) - zero_or_one

map_member/3

True if Map is a ordered map structure which records the pair Key-Data. Key must be ground.

Compilation flags:

static

Template:

map_member(Key,Map,Data)

Mode and number of proofs:

`map_member(+nonvar,+nonvar,?nonvar) - zero_or_one`

`map_store/4`

True if Map0 is an ordered map structure, Key must be ground, and Map1 is identical to Map0 except that the pair Key-Data is recorded by Map1.

Compilation flags:

`static`

Template:

`map_store(Map0,Key,Data,Map1)`

Mode and number of proofs:

`map_store(+nonvar,+nonvar,+nonvar,?nonvar) - zero_or_one`

`pp_string/1`

Prints String onto the current output stream. If String contains only 7-bit chars it is printed in shorthand quoted format, otherwise it is written as a list.

Compilation flags:

`static`

Template:

`pp_string(String)`

Mode and number of proofs:

`pp_string(+nonvar) - zero_or_one`

fault/5

Identifies SubTerm as a sub-term of Term which cannot be serialized after Indentation. Message is an atom naming the type of error; Path is a string encoding a list of SubTerm's ancestor elements in the form <tag>{(id)}* where <tag> is the element tag and <id> is the value of any attribute `_named_id`.

Compilation flags:

static

Template:

fault(Term,Indentation,SubTerm,Path,Message)

Mode and number of proofs:

fault(+nonvar,+nonvar,?nonvar,?nonvar,?nonvar) - zero_or_one

exception/4

Hook to raise an exception to be raised in respect of a fault in the XML Term Document.

Compilation flags:

static

Template:

exception(Message,Document,Culprit,Path)

Mode and number of proofs:

exception(+atom,+nonvar,+nonvar,+nonvar) - one

document_generation//2

DCG generating Document as a list of character codes. Format is true|false defining whether layouts, to provide indentation, should be added between the element content of the resultant "string". Note that formatting is disabled for elements that are interspersed with pcdat/1 terms, such as XHTML's 'inline' elements. Also, Format is over-ridden, for an individual element, by an explicit 'xml:space'="preserve" attribute.

Compilation flags:

static

Template:

document_generation(Format,Document)

Mode and number of proofs:

document_generation(+nonvar,+nonvar) - zero_or_one

pcdata_7bit//1

Represents the ASCII character set in its simplest format, using the character entities &, ", <, and > which are common to both XML and HTML. The numeric entity ' is used in place of ' because browsers don't recognize it in HTML.

Compilation flags:

static

Template:

pcdata_7bit(Code)

Mode and number of proofs:

pcdata_7bit(?nonvar) - zero_or_one

character_data_format/3

Holds when Format0 and Format1 are the statuses of XML formatting before and after Codes - which may be null.

Compilation flags:

static

Template:

character_data_format(Codes,Format0,Format1)

Mode and number of proofs:

character_data_format(+nonvar,+nonvar,?nonvar) - zero_or_one

`cdata_generation//1`

Holds when Format0 and Format1 are the statuses of XML formatting before and after Codes - which may be null.

Compilation flags:

`static`

Template:

`cdata_generation(Codes)`

Mode and number of proofs:

`cdata_generation(+list) - zero_or_one`

Operators

(none)

1.78 zippers

protocol

1.78.1 zipperp

Zipper protocol.

Availability:

`logtalk_load(zippers(loader))`

Author: Paulo Moura

Version: 1:0:0

Date: 2019-01-20

Compilation flags:

`static`

Dependencies:

(none)

Remarks:

(none)

Inherited public predicates:

(none)

- Public predicates
 - zip/2
 - zip/3
 - unzip/2
 - current/2
 - next/2
 - next/3
 - previous/2
 - previous/3
 - rewind/2
 - rewind/3
 - forward/2
 - forward/3
 - apply/2
 - insert_before/3
 - insert_after/3
 - replace/3
 - delete_and_previous/2
 - delete_and_next/2
 - delete_and_unzip/2
 - delete_all_before/2
 - delete_all_before_and_unzip/2
 - delete_all_after/2
 - delete_all_after_and_unzip/2
- Protected predicates
- Private predicates
- Operators

Public predicates

zip/2

Adds a zipper to a compound term holding a sequence of elements. Fails if the sequence is empty.

Compilation flags:

static

Template:

zip(Sequence,Zipper)

Mode and number of proofs:

zip(+sequence,--zipper) - zero_or_one

zip/3

Adds a zipper to a compound term holding a sequence of elements. Also returns the first element. Fails if the sequence is empty.

Compilation flags:

static

Template:

zip(Sequence,Zipper,First)

Mode and number of proofs:

zip(+sequence,--zipper,--term) - zero_or_one

unzip/2

Removes a zipper from a sequence.

Compilation flags:

static

Template:

unzip(Zipper,Sequence)

Mode and number of proofs:

`unzip(@zipper,--sequence) - one`

`current/2`

Current element.

Compilation flags:

`static`

Template:

`current(Zipper,Current)`

Mode and number of proofs:

`current(+zipper,?term) - zero_or_one`

`next/2`

Moves to the next element. Fails if already at the last elements.

Compilation flags:

`static`

Template:

`next(Zipper,NewZipper)`

Mode and number of proofs:

`next(+zipper,--zipper) - zero_or_one`

`next/3`

Moves to and returns the next element. Fails if already at the last elements.

Compilation flags:

`static`

Template:

next(Zipper,NewZipper,Next)

Mode and number of proofs:

next(+zipper,--zipper,-term) - zero_or_one

previous/2

Moves to the previous element. Fails if already at the first elements.

Compilation flags:

static

Template:

previous(Zipper,NewZipper)

Mode and number of proofs:

previous(+zipper,--zipper) - zero_or_one

previous/3

Moves to and returns the previous element. Fails if already at the first element.

Compilation flags:

static

Template:

previous(Zipper,NewZipper,Previous)

Mode and number of proofs:

previous(+zipper,--zipper,-term) - zero_or_one

rewind/2

Rewinds the zipper so that the first element becomes the current element.

Compilation flags:

static

Template:

rewind(Zipper,NewZipper)

Mode and number of proofs:

rewind(+zipper,--zipper) - one

rewind/3

Rewinds the zipper so that the first element becomes the current element. Also returns the first element.

Compilation flags:

static

Template:

rewind(Zipper,NewZipper,First)

Mode and number of proofs:

rewind(+zipper,--zipper,?term) - zero_or_one

forward/2

Forward the zipper so that the last element becomes the current element.

Compilation flags:

static

Template:

forward(Zipper,NewZipper)

Mode and number of proofs:

forward(+zipper,--zipper) - one

forward/3

Forward the zipper so that the last element becomes the current element. Also returns the last element.

Compilation flags:

static

Template:

forward(Zipper,NewZipper,Last)

Mode and number of proofs:

forward(+zipper,--zipper,?term) - zero_or_one

apply/2

Applies a closure to the current element.

Compilation flags:

static

Template:

apply(Closure,Zipper)

Meta-predicate template:

apply(1,*)

Mode and number of proofs:

apply(+callable,+zipper) - zero_or_more

insert_before/3

Inserts an element before the current one.

Compilation flags:

static

Template:

insert_before(Zipper,Element,NewZipper)

Mode and number of proofs:

insert_before(+zipper,?term,--zipper) - zero_or_one

insert_after/3

Inserts an element after the current one.

Compilation flags:

static

Template:

insert_after(Zipper,Element,NewZipper)

Mode and number of proofs:

insert_after(+zipper,?term,--zipper) - zero_or_one

replace/3

Replaces the current element with a new element.

Compilation flags:

static

Template:

replace(Zipper,NewCurrent,NewZipper)

Mode and number of proofs:

replace(+zipper,?term,--zipper) - one

delete_and_previous/2

Deletes the current element and moves to the previous element. Fails if no previous element exists.

Compilation flags:

static

Template:

delete_and_previous(Zipper,NewZipper)

Mode and number of proofs:

`delete_and_previous(+zipper,--zipper) - zero_or_one`

`delete_and_next/2`

Deletes the current element and moves to the next element. Fails if no next element exists.

Compilation flags:

`static`

Template:

`delete_and_next(Zipper,NewZipper)`

Mode and number of proofs:

`delete_and_next(+zipper,--zipper) - zero_or_one`

`delete_and_unzip/2`

Deletes the current element and removes the zipper returning the resulting sequence.

Compilation flags:

`static`

Template:

`delete_and_unzip(Zipper,Sequence)`

Mode and number of proofs:

`delete_and_unzip(+zipper,--sequence) - one`

`delete_all_before/2`

Deletes all elements before the current element.

Compilation flags:

`static`

Template:

```
delete_all_before(Zipper,NewZipper)
```

Mode and number of proofs:

```
delete_all_before(+zipper,--zipper) - one
```

```
delete_all_before_and_unzip/2
```

Deletes all elements before the current element and removes the zipper returning the resulting sequence.

Compilation flags:

```
static
```

Template:

```
delete_all_before_and_unzip(Zipper,NewZipper)
```

Mode and number of proofs:

```
delete_all_before_and_unzip(+zipper,--sequence) - one
```

```
delete_all_after/2
```

Deletes all elements after the current element.

Compilation flags:

```
static
```

Template:

```
delete_all_after(Zipper,NewZipper)
```

Mode and number of proofs:

```
delete_all_after(+zipper,--zipper) - one
```

`delete_all_after_and_unzip/2`

Deletes all elements after the current element and removes the zipper returning the resulting sequence.

Compilation flags:

`static`

Template:

`delete_all_after_and_unzip(Zipper,NewZipper)`

Mode and number of proofs:

`delete_all_after_and_unzip(+zipper,--sequence) - one`

Protected predicates

(none)

Private predicates

(none)

Operators

(none)

See also:

`zlist`

object

1.78.2 `zlist`

Zipper list predicates. Zippers should be regarded as opaque terms.

Availability:

`logtalk_load(zippers(loader))`

Author: Paulo Moura

Version: 1:0:1

Date: 2019-03-12

Compilation flags:

static, context_switching_calls

Implements:

public zipperp

Remarks:

(none)

Inherited public predicates:

apply/2 current/2 delete_all_after/2 delete_all_after_and_unzip/2 delete_all_before/2
delete_all_before_and_unzip/2 delete_and_next/2 delete_and_previous/2 delete_and_unzip/2
forward/2 forward/3 insert_after/3 insert_before/3 next/2 next/3 previous/2 previous/3
replace/3 rewind/2 rewind/3 unzip/2 zip/2 zip/3

- Public predicates
 - zip_at_index/4
- Protected predicates
- Private predicates
- Operators

Public predicates

zip_at_index/4

Adds a zipper to a list opened at the given index and also returns the element at the index. Fails if the list is empty or the index (starting at 1) does not exist.

Compilation flags:

static

Template:

zip_at_index(Index,List,Zipper,Element)

Mode and number of proofs:

zip_at_index(+natural,+list,--zipper,--term) - zero_or_one

Protected predicates

(no local declarations; see entity ancestors if any)

Private predicates

(no local declarations; see entity ancestors if any)

Operators

(none)

DIRECTORIES

To load an entity, always load the library that includes it using the goal `logtalk_load(library_name(loader))` instead of using its path. The library loader file ensures that all the required dependencies are also loaded and that any required flags are used. The loading goal can be found in the entity documentation.

-
- 2.1** [contributions/flags/](#)
 - 2.2** [contributions/iso8601/](#)
 - 2.3** [contributions/pddl_parser/](#)
 - 2.4** [contributions/verdi_neruda/](#)
 - 2.5** [contributions/xml_parser/](#)
 - 2.6** [core/](#)
 - 2.7** [library/](#)
 - 2.8** [library/arbitrary/](#)
 - 2.9** [library/assignvars/](#)
 - 2.10** [library/base64/](#)
 - 2.11** [library/cbor/](#)
 - 2.12** [library/coroutining/](#)
 - 2.13** [library/csv/](#)
 - 2.14** [library/dates/](#)
 - 2.15** [library/dependents/](#)
 - 2.16** [library/dictionaries/](#)
 - 2.17** [library/dif/](#)
 - 2.18** [library/edcg/](#)
 - 2.19** [library/events/](#)
 - 2.20** [library/expand_library_alias_paths/](#)
 - 2.1.** [contributions/flags/](#)
 - 2.21** [library/expecteds/](#)

ENTITIES

To load an entity, always load the library that includes it using the goal `logtalk_load(library_name(loader))` instead of loading just the entity. The library loader file ensures that all the required dependencies are also loaded and that any required flags are used. The loading goal can be found in the entity documentation.

3.1 Categories

3.2 Objects

3.3 Protocols

PREDICATES

This index lists all entities declaring a given predicate. To load an entity providing the predicate that you want to call, always load the library that includes it using the goal `logtalk_load(library_name(loader))` instead of loading just the entity. The library loader file ensures that all the required dependencies are also loaded and that any required flags are used. The loading goal can be found in the entity documentation.

4.1 (`/`)/2

- `help`

4.2 (`//`)/2

- `help`

4.3 (`<`)/2

- `comparingp`

4.4 (`<=`)/2

- `assignvarsp`
- `streamvars`

4.5 (`:=`)/2

- `comparingp`

4.6 (= <)/2

- comparingp

4.7 (= >)/2

- assignvarsp
- streamvars

4.8 (= \=)/2

- comparingp

4.9 = ~ = / 2

- lgtunit
- number

4.10 (>)/2

- comparingp

4.11 (>=)/2

- comparingp

4.12 absolute_file_name/2

- osp

4.13 activate_debug_handler/1

- logtalk

4.14 activate_monitor/0

- monitorp

4.15 active_debug_handler/1

- logtalk

4.16 add/1

- registries

4.17 add/2

- registries

4.18 add/3

- difflist
- registries

4.19 addDependent/1

- subject

4.20 after/2

- intervalp

4.21 after/3

- monitoring

4.22 all/0

- code_metric
- dead_code_scanner
- lgtdocp

4.23 all/1

- code_metric
- dead_code_scanner
- lgtdocp

4.24 all_files/0

- diagram(Format)
- diagrams(Format)

4.25 all_files/1

- diagram(Format)
- diagrams(Format)

4.26 all_libraries/0

- diagram(Format)
- diagrams(Format)

4.27 all_libraries/1

- diagram(Format)
- diagrams(Format)

4.28 all_score/1

- code_metric

4.29 ancestor/1

- hierarchyp

4.30 ancestors/1

- hierarchyp

4.31 apis/0

- help_info_support

4.32 apis/1

- help_info_support

4.33 append/2

- listp

4.34 append/3

- listp
- queuep
- varlistp

4.35 apply/2

- zipperp

4.36 apply/4

- dictionaryp

4.37 approximately_equal/2

- lgtunit
- number

4.38 approximately_equal/3

- lgtunit
- number

4.39 arbitrary/1

- arbitrary

4.40 arbitrary/2

- arbitrary

4.41 archive/1

- registry_protocol

4.42 arithmetic_mean/2

- statisticsp

4.43 array_list/2

- java_utils_protocol

4.44 array_to_list/2

- java_utils_protocol

4.45 array_to_terms/2

- java_utils_protocol

4.46 array_to_terms/3

- java_utils_protocol

4.47 as_curly_bracketed/2

- dictionaryp
- nested_dictionary_protocol

4.48 as_dictionary/2

- dictionaryp

4.49 as_difflist/2

- list

4.50 as_heap/2

- heapp

4.51 as_list/2

- dictionaryp
- difflist
- heapp
- queuep
- setp

4.52 as_nested_dictionary/2

- nested_dictionary_protocol

4.53 as_set/2

- setp

4.54 ask_question/5

- logtalk

4.55 assertion/1

- assertions(Mode)
- lgtunit

4.56 assertion/2

- assertions(Mode)
- lgtunit

4.57 assignable/1

- assignvarsp

4.58 assignable/2

- assignvarsp

4.59 available/0

- packs

4.60 available/1

- packs

4.61 available/2

- packs

4.62 average/2

- numberlistp

4.63 average_deviation/3

- statisticsp

4.64 before/2

- intervalp

4.65 before/3

- monitoring

4.66 bench_goal/1

- databasep

4.67 benchmark/2

- lgtunit

4.68 benchmark/3

- lgtunit

4.69 benchmark/4

- lgtunit

4.70 benchmark_reified/3

- lgtunit

4.71 between/3

- integer
- random_protocol

4.72 bit//1

- number_grammars(Format)

4.73 bits//1

- number_grammars(Format)

4.74 blank//0

- blank_grammars(Format)

4.75 blanks//0

- blank_grammars(Format)

4.76 body_pred/1

- metagol

4.77 branch/2

- git_protocol

4.78 built_in_directive/4

- help

4.79 built_in_flag/2

- flags

4.80 built_in_method/4

- help

4.81 built_in_non_terminal/4

- help

4.82 built_in_predicate/4

- help

4.83 calendar_month/3

- iso8601

4.84 call_with_timeout/2

- timeout

4.85 call_with_timeout/3

- timeout

4.86 cat/2

- maybe

4.87 change_directory/1

- osp

4.88 changed/0

- subject

4.89 changed/1

- subject

4.90 chebyshev_distance/3

- numberlistp

4.91 chebyshev_norm/2

- numberlistp

4.92 check/1

- temp
- varlistp

4.93 check/2

- type

4.94 check/3

- type

4.95 check_option/1

- options_protocol

4.96 check_options/1

- options_protocol

4.97 chr_is/2

- toychrdb

4.98 chr_no_spy/1

- toychrdb

4.99 chr_nospy/0

- toychrdb

4.100 chr_notrace/0

- toychrdb

4.101 chr_option/2

- toychrdb

4.102 chr_spy/1

- toychrdb

4.103 chr_trace/0

- toychrdb

4.104 class/1

- class_hierarchy

4.105 classes/1

- class_hierarchy

4.106 clause/5

- ports_profiler

4.107 clause_location/6

- ports_profiler

4.108 clean/0

- packs
- registries

4.109 clean/1

- packs
- registries

4.110 clean/2

- packs

4.111 clone/1

- cloning
- registry_protocol

4.112 clone/3

- dictionaryp

4.113 clone/4

- dictionaryp

4.114 coefficient_of_variation/2

- statisticsp

4.115 `command_line_arguments/1`

- `osp`

4.116 `commit_author/2`

- `git_protocol`

4.117 `commit_date/2`

- `git_protocol`

4.118 `commit_hash/2`

- `git_protocol`

4.119 `commit_hash_abbreviated/2`

- `git_protocol`

4.120 `commit_log/3`

- `git_protocol`

4.121 `commit_message/2`

- `git_protocol`

4.122 `compile_aux_clauses/1`

- `logtalk`

4.123 compile_predicate_heads/4

- logtalk

4.124 compile_predicate_indicators/3

- logtalk

4.125 completion/2

- help

4.126 completions/2

- help

4.127 connect/1

- redis

4.128 connect/3

- redis

4.129 console/1

- redis

4.130 contains/2

- intervalp

4.131 control//0

- blank_grammars(Format)

4.132 control_construct/4

- help

4.133 controls//0

- blank_grammars(Format)

4.134 copy_file/2

- osp

4.135 counter/2

- counters
- mutations_store

4.136 cover/1

- lgtunit

4.137 cpu_time/1

- osp
- timep

4.138 current/2

- zipperp

4.139 data/0

- ports_profiler

4.140 data/1

- ports_profiler

4.141 data/2

- ports_profiler

4.142 date/4

- iso8601

4.143 date/5

- iso8601

4.144 date/6

- iso8601

4.145 date/7

- iso8601

4.146 date_string/3

- iso8601

4.147 date_time/7

- osp

4.148 days_in_month/3

- datep

4.149 deactivate_debug_handler/0

- logtalk

4.150 debug/0

- debuggerp

4.151 debug_handler/1

- logtalk

4.152 debug_handler/3

- logtalk

4.153 debugging/0

- debuggerp

4.154 debugging/1

- debuggerp

4.155 decide/1

- fcube

4.156 decide/2

- fcube

4.157 decode_exception/2

- java_utils_protocol

4.158 decode_exception/3

- java_utils_protocol

4.159 decompile_predicate_heads/4

- logtalk

4.160 decompile_predicate_indicators/4

- logtalk

4.161 decompose_file_name/3

- osp

4.162 decompose_file_name/4

- osp

4.163 decrement_counter/1

- counters

4.164 default_option/1

- options_protocol
- wrapper

4.165 default_options/1

- options_protocol
- wrapper

4.166 define_log_file/2

- loggingp

4.167 defined/4

- registries

4.168 defined_flag/6

- flags

4.169 del_monitors/0

- event_registryp

4.170 del_monitors/4

- event_registryp

4.171 del_spy_points/4

- monitorp

4.172 delete/0

- registries

4.173 delete/1

- registries

4.174 delete/2

- registries

4.175 delete/3

- listp
- setp
- varlistp

4.176 delete/4

- dictionaryp
- heapp

4.177 delete_all_after/2

- zipperp

4.178 delete_all_after_and_unzip/2

- zipperp

4.179 delete_all_before/2

- zipperp

4.180 delete_all_before_and_unzip/2

- zipperp

4.181 delete_and_next/2

- zipperp

4.182 delete_and_previous/2

- zipperp

4.183 delete_and_unzip/2

- zipperp

4.184 delete_directory/1

- osp

4.185 delete_directory_and_contents/1

- osp

4.186 delete_directory_contents/1

- osp

4.187 delete_file/1

- osp

4.188 delete_in/4

- nested_dictionary_protocol

4.189 delete_matches/3

- listp

4.190 delete_max/4

- dictionaryp

4.191 delete_min/4

- dictionaryp

4.192 dependents/1

- packs
- subject

4.193 dependents/2

- packs

4.194 dependents/3

- packs

4.195 depth/2

- temp

4.196 descendant/1

- hierarchyp

4.197 descendant_class/1

- class_hierarchyp

4.198 descendant_classes/1

- class_hierarchyp

4.199 descendant_instance/1

- class_hierarchyp

4.200 descendant_instances/1

- class_hierarchyp

4.201 descendants/1

- hierarchyp

4.202 describe/1

- packs
- registries

4.203 describe/2

- packs

4.204 description/1

- pack_protocol
- registry_protocol

4.205 deterministic/1

- lgtunit

4.206 deterministic/2

- lgtunit

4.207 diagram_description/1

- diagram(Format)

4.208 diagram_name_suffix/1

- diagram(Format)

4.209 dif/1

- coroutining
- dif

4.210 dif/2

- coroutining
- dif

4.211 digit//1

- number_grammars(Format)

4.212 digits//1

- number_grammars(Format)

4.213 directories/1

- lgtdocp
- wrapper

4.214 directories/2

- diagram(Format)
- diagrams(Format)
- lgtdocp
- wrapper

4.215 directories/3

- diagram(Format)
- diagrams(Format)

4.216 directory/1

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp
- packs_common
- wrapper

4.217 directory/2

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp
- packs_common
- wrapper

4.218 directory/3

- diagram(Format)
- diagrams(Format)

4.219 directory_exists/1

- osp

4.220 directory_files/2

- osp

4.221 directory_files/3

- osp

4.222 directory_score/2

- code_metric

4.223 disable/1

- debug_messages

4.224 disable/2

- debug_messages

4.225 disable_logging/1

- loggingp

4.226 disconnect/1

- redis

4.227 disjoint/2

- setp

4.228 disjoint_sets/2

- union_find_protocol

4.229 doc_goal/1

- doclet

4.230 dot//1

- number_grammars(Format)

4.231 dowhile/2

- loopp

4.232 drop/3

- listp

4.233 during/2

- intervalp

4.234 easter_day/3

- iso8601

4.235 edge/6

- graph_language_protocol

4.236 edge_case/2

- arbitrary

4.237 either/3

- expected(Expected)

4.238 empty/1

- dictionaryp
- heapp
- listp
- nested_dictionary_protocol
- optional
- queuep
- setp
- varlistp

4.239 enable/1

- debug_messages

4.240 enable/2

- debug_messages

4.241 enable_logging/1

- loggingp

4.242 enabled/1

- debug_messages

4.243 enabled/2

- debug_messages

4.244 ensure_directory/1

- osp

4.245 ensure_file/1

- osp

4.246 entity/1

- code_metric
- dead_code_scanner
- help
- xref_diagram(Format)

4.247 entity/2

- xref_diagram(Format)

4.248 entity_info_pair_score_hook/3

- doc_metric

4.249 entity_info_score_hook/2

- doc_metric

4.250 entity_predicates_weights_hook/2

- doc_metric

4.251 entity_prefix/2

- logtalk

4.252 entity_score/2

- code_metric

4.253 enumerate/2

- random_protocol

4.254 environment_variable/2

- osp

4.255 epsilon/1

- lgtunit

4.256 equal/2

- intervalp
- setp

4.257 erase/1

- recorded_database_core

4.258 essentially_equal/3

- lgtunit
- number

4.259 euclidean_distance/3

- numberlistp

4.260 euclidean_norm/2

- numberlistp

4.261 exclude/3

- metap

4.262 execution_context/7

- logtalk

4.263 expand_library_path/2

- logtalk

4.264 expected/1

- expected(Expected)

4.265 expecteds/2

- either

4.266 explain//1

- tutor

4.267 extension/1

- proto_hierarchy

4.268 extensions/1

- proto_hierarchy

4.269 false/1

- java_utils_protocol

4.270 fcube/0

- fcube

4.271 file/1

- code_metric
- dead_code_scanner
- entity_diagram(Format)
- lgtdocp
- wrapper

4.272 file/2

- code_metric
- dead_code_scanner
- entity_diagram(Format)
- lgtdocp
- wrapper

4.273 file_exists/1

- osp

4.274 file_footer/3

- graph_language_protocol

4.275 file_header/3

- graph_language_protocol

4.276 file_modification_time/2

- osp

4.277 file_permission/2

- osp

4.278 file_score/2

- code_metric

4.279 file_size/2

- osp

4.280 file_to_bytes/2

- reader

4.281 file_to_bytes/3

- reader

4.282 file_to_chars/2

- reader

4.283 file_to_chars/3

- reader

4.284 file_to_codes/2

- reader

4.285 file_to_codes/3

- reader

4.286 file_to_terms/2

- reader

4.287 file_to_terms/3

- reader

4.288 file_type_extension/2

- logtalk

4.289 files/1

- diagram(Format)
- diagrams(Format)
- lgtdocp
- wrapper

4.290 files/2

- diagram(Format)
- diagrams(Format)
- lgtdocp
- wrapper

4.291 files/3

- diagram(Format)
- diagrams(Format)

4.292 filter/2

- optional(Optional)

4.293 find/4

- union_find_protocol

4.294 find/5

- union_find_protocol

4.295 findall_member/4

- metap

4.296 findall_member/5

- metap

4.297 finished_by/2

- intervalp

4.298 finishes/2

- intervalp

4.299 flag_group_chk/1

- flags

4.300 flag_groups/1

- flags

4.301 flat_map/2

- expected(Expected)
- optional(Optional)

4.302 flatten/2

- listp
- varlistp

4.303 float//1

- number_grammars(Format)

4.304 fold_left/4

- metap

4.305 fold_left_1/3

- metap

4.306 fold_right/4

- metap

4.307 fold_right_1/3

- metap

4.308 fordownto/3

- loopp

4.309 fordownto/4

- loopp

4.310 fordownto/5

- loopp

4.311 foreach/3

- loopp

4.312 foreach/4

- loopp

4.313 format/2

- format

4.314 format/3

- format

4.315 format_entity_score//2

- code_metric

4.316 `format_object/1`

- `diagram(Format)`

4.317 `format_to_atom/3`

- `term_io_protocol`

4.318 `format_to_chars/3`

- `term_io_protocol`

4.319 `format_to_chars/4`

- `term_io_protocol`

4.320 `format_to_codes/3`

- `term_io_protocol`

4.321 `format_to_codes/4`

- `term_io_protocol`

4.322 `forto/3`

- `loopp`

4.323 `forto/4`

- `loopp`

4.324 forto/5

- loopp

4.325 forward/1

- forwarding

4.326 forward/2

- zipperp

4.327 forward/3

- zipperp

4.328 fractile/3

- statisticsp

4.329 freeze/2

- coroutining

4.330 from_generator/2

- expected
- optional

4.331 from_generator/3

- expected
- optional

4.332 from_generator/4

- expected

4.333 from_goal/2

- expected
- optional

4.334 from_goal/3

- expected
- optional

4.335 from_goal/4

- expected

4.336 frozen/2

- coroutining

4.337 full_device_path/1

- osp

4.338 func_test/3

- metagol

4.339 functional/0

- metagol

4.340 generate/1

- ids(Representation,Bytes)
- ulid_protocol

4.341 generate/2

- base64
- base64url
- cbor(StringRepresentation)
- html
- json_protocol
- ulid_protocol

4.342 generate/8

- ulid_protocol

4.343 genint/2

- genint_core

4.344 gensym/2

- gensym_core

4.345 geometric_mean/2

- statisticsp

4.346 get/1

- optional(Optional)

4.347 get_field/2

- java_access_protocol

4.348 get_flag_value/2

- flags

4.349 get_seed/1

- arbitrary
- pseudo_random_protocol

4.350 gnu/0

- fcube

4.351 goal_expansion/2

- expanding

4.352 graph_footer/5

- graph_language_protocol

4.353 graph_header/5

- graph_language_protocol

4.354 ground/1

- temp

4.355 group_by_key/2

- pairs

4.356 group_consecutive_by_key/2

- pairs

4.357 group_sorted_by_key/2

- pairs

4.358 guess_arity/2

- csv_protocol

4.359 guess_separator/2

- csv_protocol

4.360 hamming_distance/3

- listp

4.361 handbook/0

- help_info_support

4.362 handbook/1

- help_info_support

4.363 harmonic_mean/2

- statisticsp

4.364 head/2

- queuep

4.365 head_pred/1

- metagol

4.366 help/0

- help
- packs_common

4.367 hex_digit//1

- number_grammars(Format)

4.368 hex_digits//1

- number_grammars(Format)

4.369 home/1

- pack_protocol
- registry_protocol

4.370 ibk/3

- metagol

4.371 if_empty/1

- optional(Optional)

4.372 if_expected/1

- expected(Expected)

4.373 if_expected_or_else/2

- expected(Expected)

4.374 if_present/1

- optional(Optional)

4.375 if_present_or_else/2

- optional(Optional)

4.376 if_unexpected/1

- expected(Expected)

4.377 include/3

- metap

4.378 increase/1

- counter

4.379 increment/0

- counter

4.380 increment_counter/1

- counters

4.381 init/0

- shell(Interpreters)

4.382 init_log_file/2

- loggingp

4.383 inorder/2

- bintree

4.384 insert/3

- setp

4.385 insert/4

- dictionaryp
- heapp

4.386 insert_after/3

- zipperp

4.387 insert_all/3

- heapp
- setp

4.388 insert_before/3

- zipperp

4.389 insert_in/4

- nested_dictionary_protocol

4.390 install/1

- packs

4.391 install/2

- packs

4.392 install/3

- packs

4.393 install/4

- packs

4.394 installed/0

- packs

4.395 installed/1

- packs

4.396 installed/3

- packs

4.397 installed/4

- packs

4.398 instance/1

- class_hierarchy

4.399 instance/2

- recorded_database_core

4.400 instances/1

- class_hierarchy

4.401 integer//1

- number_grammars(Format)

4.402 internal_os_path/2

- osp

4.403 intersect/2

- setp

4.404 intersection/2

- dictionaryp

4.405 intersection/3

- dictionaryp
- setp

4.406 intersection/4

- setp

4.407 invoke/1

- java_access_protocol

4.408 invoke/2

- java_access_protocol

4.409 ipv4//1

- ip_grammars(Format)

4.410 ipv6//1

- ip_grammars(Format)

4.411 is_absolute_file_name/1

- osp

4.412 is_alpha/1

- characterp

4.413 is_alphanumeric/1

- characterp

4.414 is_ascii/1

- characterp

4.415 is_bin_digit/1

- characterp

4.416 is_control/1

- characterp

4.417 is_dec_digit/1

- characterp

4.418 is_empty/0

- optional(Optional)

4.419 is_end_of_line/1

- characterp

4.420 is_expected/0

- expected(Expected)

4.421 is_false/1

- java_utils_protocol

4.422 is_hex_digit/1

- characterp

4.423 is_layout/1

- characterp

4.424 is_letter/1

- characterp

4.425 is_lower_case/1

- characterp

4.426 is_newline/1

- characterp

4.427 is_null/1

- java_utils_protocol

4.428 is_object/1

- java_utils_protocol

4.429 is_octal_digit/1

- characterp

4.430 is_period/1

- characterp

4.431 is_present/0

- optional(Optional)

4.432 is_punctuation/1

- characterp

4.433 is_quote/1

- characterp

4.434 is_true/1

- java_utils_protocol

4.435 is_unexpected/0

- expected(Expected)

4.436 is_upper_case/1

- characterp

4.437 is_void/1

- java_utils_protocol

4.438 is_vowel/1

- characterp

4.439 is_white_space/1

- characterp

4.440 iterator_element/2

- java_utils_protocol

4.441 join/3

- queuep

4.442 join_all/3

- queuep

4.443 jump/3

- queuep

4.444 jump_all/3

- queuep

4.445 jump_all_block/3

- queuep

4.446 key/2

- pairs

4.447 keys/2

- dictionaryp
- pairs

4.448 keys_values/3

- pairs

4.449 keysort/2

- listp

4.450 kurtosis/2

- statisticsp

4.451 language_object/2

- graph_language_registry

4.452 last/2

- listp
- varlistp

4.453 leaf/1

- hierarchyp

4.454 leaf_class/1

- class_hierarchyp

4.455 leaf_classes/1

- class_hierarchyp

4.456 leaf_instance/1

- class_hierarchyp

4.457 leaf_instances/1

- class_hierarchyp

4.458 leap_year/1

- datep
- iso8601

4.459 learn/0

- metagol_example_protocol

4.460 learn/1

- metagol_example_protocol

4.461 learn/2

- metagol

4.462 learn/3

- metagol

4.463 learn_seq/2

- metagol

4.464 learn_with_timeout/4

- metagol

4.465 leash/1

- debuggerp

4.466 leashing/1

- debuggerp

4.467 least_common_multiple/2

- numberlistp

4.468 leaves/1

- hierarchyp

4.469 length/2

- listp
- queuep
- varlistp

4.470 libraries/1

- diagram(Format)
- diagrams(Format)
- lgtdocp

4.471 libraries/2

- diagram(Format)
- diagrams(Format)
- lgtdocp

4.472 libraries/3

- diagram(Format)
- diagrams(Format)

4.473 library/0

- help

4.474 library/1

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- help
- lgtdocp

4.475 library/2

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp

4.476 library_score/2

- code_metric

4.477 license/1

- pack_protocol

4.478 line_to_chars/2

- reader

4.479 line_to_chars/3

- reader

4.480 line_to_codes/2

- reader

4.481 line_to_codes/3

- reader

4.482 lint/0

- packs
- registries

4.483 lint/1

- packs
- registries

4.484 lint/2

- packs

4.485 list/0

- registries

4.486 list_to_array/2

- java_utils_protocol

4.487 listing/0

- listing

4.488 listing/1

- listing

4.489 loaded_file/1

- logtalk

4.490 loaded_file_property/2

- logtalk
- modules_diagram_support

4.491 log/3

- debuggerp

4.492 log_event/2

- loggingp

4.493 log_file/2

- loggingp

4.494 logging/1

- loggingp

4.495 logging/3

- debuggerp

4.496 logtalk_packs/0

- packs_common

4.497 logtalk_packs/1

- packs_common

4.498 lookup/2

- dictionaryp

4.499 lookup/3

- dictionaryp

4.500 lookup_in/3

- nested_dictionary_protocol

4.501 lower_upper/2

- characterp

4.502 magic/2

- magic

4.503 magicise/4

- magic

4.504 make_directory/1

- osp

4.505 make_directory_path/1

- osp

4.506 make_set/3

- union_find_protocol

4.507 man/1

- help_info_support

4.508 manhattan_distance/3

- numberlistp

4.509 manhattan_norm/2

- numberlistp

4.510 manuals/0

- help

4.511 map/2

- dictionaryp
- expected(Expected)
- metap
- optional(Optional)
- queuep

4.512 map/3

- dictionaryp
- metap
- pairs
- queuep

4.513 map/4

- metap

4.514 map/5

- metap

4.515 map/6

- metap

4.516 map/7

- metap

4.517 map/8

- metap

4.518 map_element/2

- java_utils_protocol

4.519 map_reduce/5

- metap

4.520 max/2

- listp
- numberlistp
- statisticsp

4.521 max/3

- dictionaryp

4.522 max_clauses/1

- metagol

4.523 max_inv_preds/1

- metagol

4.524 max_size/1

- arbitrary

4.525 maybe/0

- random_protocol

4.526 maybe/1

- random_protocol

4.527 maybe/2

- random_protocol

4.528 maybe_call/1

- random_protocol

4.529 maybe_call/2

- random_protocol

4.530 mean_deviation/2

- statisticsp

4.531 median/2

- numberlistp
- statisticsp

4.532 median_deviation/2

- statisticsp

4.533 meets/2

- intervalp

4.534 member/2

- listp
- random_protocol
- setp

4.535 memberchk/2

- listp
- setp
- varlistp

4.536 merge/3

- heapp

4.537 message_hook/4

- logtalk

4.538 message_prefix_file/6

- logtalk

4.539 message_prefix_stream/4

- logtalk

4.540 message_tokens//2

- logtalk

4.541 met_by/2

- intervalp

4.542 meta_type/3

- type

4.543 metarule/6

- metagol

4.544 metarule_next_id/1

- metagol

4.545 min/2

- listp
- numberlistp
- statisticsp

4.546 min/3

- dictionaryp

4.547 min_clauses/1

- metagol

4.548 min_max/3

- numberlistp
- statisticsp

4.549 modes/2

- numberlistp
- statisticsp

4.550 module_property/2

- modules_diagram_support

4.551 monitor/1

- event_registryp

4.552 monitor/4

- event_registryp

4.553 monitor_activated/0

- monitorp

4.554 monitored/1

- event_registryp

4.555 monitors/1

- event_registryp

4.556 msort/2

- listp

4.557 msort/3

- listp

4.558 mutation/3

- mutations
- mutations_store

4.559 name/1

- pack_protocol
- registry_protocol

4.560 name_of_day/3

- datep

4.561 name_of_month/3

- datep

4.562 natural//1

- number_grammars(Format)

4.563 new/1

- java_access_protocol
- nested_dictionary_protocol
- streamvars
- temp

4.564 new/2

- java_access_protocol
- streamvars
- union_find_protocol

4.565 new/3

- intervalp

4.566 new_line//0

- blank_grammars(Format)

4.567 new_lines//0

- blank_grammars(Format)

4.568 next/2

- zipperp

4.569 next/3

- zipperp

4.570 next/4

- dictionaryp

4.571 nextto/3

- listp
- varlistp

4.572 node/7

- graph_language_protocol

4.573 nodebug/0

- debuggerp

4.574 nolog/3

- debuggerp

4.575 nologall/0

- debuggerp

4.576 non_blank//1

- blank_grammars(Format)

4.577 non_blanks//1

- blank_grammars(Format)

4.578 normal_element/2

- html

4.579 normalize_range/2

- numberlistp

4.580 normalize_range/4

- numberlistp

4.581 normalize_scalar/2

- numberlistp

4.582 normalize_unit/2

- numberlistp

4.583 nospy/1

- debuggerp

4.584 nospy/3

- debuggerp

4.585 nospy/4

- debuggerp

4.586 nospyall/0

- debuggerp

4.587 note/2

- registry_protocol

4.588 note/3

- pack_protocol

4.589 notrace/0

- debuggerp

4.590 now/3

- timep

4.591 nth0/3

- listp
- varlistp

4.592 nth0/4

- listp
- varlistp

4.593 nth1/3

- listp
- varlistp

4.594 nth1/4

- listp
- varlistp

4.595 null/1

- java_utils_protocol

4.596 null_device_path/1

- osp

4.597 number//1

- number_grammars(Format)

4.598 number_of_tests/1

- lgtunit

4.599 numbervars/1

- temp

4.600 numbervars/3

- temp

4.601 occurrences/2

- listp

4.602 occurrences/3

- listp

4.603 occurs/2

- temp

4.604 of/2

- optional

4.605 of_expected/2

- expected

4.606 of_unexpected/2

- expected

4.607 one_or_more//0

- sequence_grammars

4.608 one_or_more//1

- sequence_grammars

4.609 one_or_more//2

- sequence_grammars

4.610 operating_system_machine/1

- osp

4.611 `operating_system_name/1`

- `osp`

4.612 `operating_system_release/1`

- `osp`

4.613 `operating_system_type/1`

- `osp`

4.614 `option/2`

- `options_protocol`

4.615 `option/3`

- `options_protocol`

4.616 `or/2`

- `optional(Optional)`

4.617 `or_else/2`

- `expected(Expected)`
- `optional(Optional)`

4.618 `or_else_call/2`

- `expected(Expected)`
- `optional(Optional)`

4.619 or_else_fail/1

- expected(Expected)
- optional(Optional)

4.620 or_else_get/2

- expected(Expected)
- optional(Optional)

4.621 or_else_throw/1

- expected(Expected)

4.622 or_else_throw/2

- optional(Optional)

4.623 orphaned/0

- packs

4.624 orphaned/2

- packs

4.625 outdated/0

- packs

4.626 outdated/1

- packs

4.627 outdated/4

- packs

4.628 output_file_name/2

- graph_language_protocol

4.629 overlapped_by/2

- intervalp

4.630 overlaps/2

- intervalp

4.631 parent/1

- proto_hierarchyp

4.632 parenthesis/2

- characterp

4.633 parents/1

- proto_hierarchyp

4.634 parse/2

- base64
- base64url
- cbor(StringRepresentation)
- json_protocol
- xml

4.635 parse/3

- xml

4.636 parse_domain/2

- pddl

4.637 parse_domain/3

- pddl

4.638 parse_problem/2

- pddl

4.639 parse_problem/3

- pddl

4.640 partial_map/4

- rbtrees

4.641 partition/3

- either

4.642 partition/4

- metap

4.643 partition/5

- listp

4.644 partition/6

- metap

4.645 path_concat/3

- osp

4.646 permutation/2

- listp
- random_protocol
- varlistp

4.647 pid/1

- osp

4.648 pin/0

- packs_common

4.649 pin/1

- packs_common

4.650 pinned/1

- packs_common

4.651 plus/3

- integer

4.652 port/5

- ports_profiler

4.653 portray_clause/1

- listing

4.654 postorder/2

- bintree

4.655 powerset/2

- setp

4.656 pp/1

- xml

4.657 pprint/1

- metagol

4.658 predicate/2

- dead_code_scanner

4.659 predicate_info_pair_score_hook/4

- doc_metric

4.660 predicate_info_score_hook/3

- doc_metric

4.661 predicate_mode_score_hook/3

- doc_metric

4.662 predicate_mode_score_hook/5

- doc_metric

4.663 predicates/2

- dead_code_scanner

4.664 prefix/0

- packs_common

4.665 prefix/1

- packs_common

4.666 prefix/2

- listp
- varlistp

4.667 prefix/3

- listp

4.668 preorder/2

- bintree

4.669 previous/2

- zipperp

4.670 previous/3

- zipperp

4.671 previous/4

- dictionaryp

4.672 print_flags/0

- flags
- flags_validator

4.673 print_flags/1

- flags

4.674 print_message/3

- logtalk

4.675 print_message_token/4

- logtalk

4.676 print_message_tokens/3

- logtalk

4.677 product/2

- numberlistp
- statisticsp

4.678 product/3

- setp

4.679 program_to_clauses/2

- metagol

4.680 proper_prefix/2

- listp

4.681 proper_prefix/3

- listp

4.682 proper_suffix/2

- listp

4.683 proper_suffix/3

- listp

4.684 prove/2

- interpreterp

4.685 prove/3

- interpreterp

4.686 provides/2

- registries

4.687 question_hook/6

- logtalk

4.688 question_prompt_stream/4

- logtalk

4.689 quick_check/1

- lgtunit

4.690 quick_check/2

- lgtunit

4.691 quick_check/3

- lgtunit

4.692 random/1

- random_protocol

4.693 random/3

- random_protocol

4.694 random_node/1

- uuid_protocol

4.695 random_tree/1

- benchmark_generators

4.696 randomize/1

- fast_random
- random

4.697 randseq/4

- random_protocol

4.698 randset/4

- random_protocol

4.699 range/2

- statisticsp

4.700 rdirectories/1

- lgtdocp

4.701 rdirectories/2

- lgtdocp

4.702 rdirectory/1

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp
- wrapper

4.703 rdirectory/2

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp
- wrapper

4.704 rdirectory/3

- diagram(Format)
- diagrams(Format)

4.705 rdirectory_score/2

- code_metric

4.706 read_file/2

- csv_protocol
- read_file
- tsv_protocol

4.707 read_file/3

- csv_protocol
- tsv_protocol

4.708 read_file_by_line/2

- csv_protocol
- tsv_protocol

4.709 read_file_by_line/3

- csv_protocol
- tsv_protocol

4.710 read_from_atom/2

- term_io_protocol

4.711 read_from_chars/2

- term_io_protocol

4.712 read_from_codes/2

- term_io_protocol

4.713 read_only_device_path/1

- osp

4.714 read_stream/2

- csv_protocol
- tsv_protocol

4.715 read_stream/3

- csv_protocol
- tsv_protocol

4.716 read_stream_by_line/2

- csv_protocol
- tsv_protocol

4.717 read_stream_by_line/3

- csv_protocol
- tsv_protocol

4.718 read_term_from_atom/3

- term_io_protocol

4.719 read_term_from_chars/3

- term_io_protocol

4.720 read_term_from_chars/4

- term_io_protocol

4.721 read_term_from_codes/3

- term_io_protocol

4.722 read_term_from_codes/4

- term_io_protocol

4.723 readme/1

- packs_common

4.724 readme/2

- packs_common

4.725 recorda/2

- recorded_database_core

4.726 recorda/3

- recorded_database_core

4.727 recorded/2

- recorded_database_core

4.728 recorded/3

- recorded_database_core

4.729 recordz/2

- recorded_database_core

4.730 recordz/3

- recorded_database_core

4.731 relative_standard_deviation/2

- statisticsp

4.732 removeDependent/1

- subject

4.733 remove_duplicates/2

- listp
- varlistp

4.734 rename_file/2

- osp

4.735 replace/3

- zipperp

4.736 replace_sub_atom/4

- atom

4.737 rescale/3

- numberlistp

4.738 reset/0

- counter
- debuggerp
- packs_common
- ports_profiler

4.739 reset/1

- ports_profiler

4.740 reset_counter/1

- counters

4.741 reset_counters/0

- counters

4.742 reset_flags/0

- flags

4.743 reset_flags/1

- flags

4.744 reset_genint/0

- genint_core

4.745 reset_genint/1

- genint_core

4.746 reset_gensym/0

- gensym_core

4.747 reset_gensym/1

- gensym_core

4.748 reset_monitor/0

- monitorp

4.749 reset_seed/0

- fast_random
- random

4.750 restore/1

- packs

4.751 restore/2

- packs

4.752 reverse/2

- listp
- varlistp

4.753 rewind/2

- zipperp

4.754 rewind/3

- zipperp

4.755 rlibraries/1

- lgtdocp

4.756 rlibraries/2

- lgtdocp

4.757 rlibrary/1

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp

4.758 rlibrary/2

- code_metric
- dead_code_scanner
- diagram(Format)
- diagrams(Format)
- lgtdocp

4.759 rlibrary_score/2

- code_metric

4.760 rule/2

- databasep

4.761 rule/3

- databasep

4.762 rule/4

- databasep

4.763 run/0

- lgtunit

4.764 run/1

- lgtunit

4.765 run/2

- lgtunit

4.766 run_test_sets/1

- lgtunit

4.767 same_length/2

- listp
- varlistp

4.768 same_length/3

- listp

4.769 save/0

- wrapper

4.770 save/1

- packs
- wrapper

4.771 save/2

- packs

4.772 scalar_product/3

- numberlistp

4.773 scan_left/4

- metap

4.774 scan_left_1/3

- metap

4.775 scan_right/4

- metap

4.776 scan_right_1/3

- metap

4.777 search/1

- packs

4.778 select/3

- listp
- random_protocol
- setp
- varlistp

4.779 select/4

- listp
- random_protocol

4.780 selectchk/3

- listp
- setp

4.781 selectchk/4

- listp

4.782 send/3

- redis

4.783 sequence/3

- integer

4.784 sequence/4

- integer
- random_protocol

4.785 sequential_occurrences/2

- listp

4.786 sequential_occurrences/3

- listp

4.787 serve/3

- queuep

4.788 set/1

- counter

4.789 set/4

- random_protocol

4.790 set_element/2

- java_utils_protocol

4.791 set_field/2

- java_access_protocol

4.792 set_flag_value/2

- flags

4.793 set_flag_value/3

- flags

4.794 set_monitor/4

- event_registry

4.795 set_seed/1

- arbitrary
- pseudo_random_protocol

4.796 set_spy_point/4

- monitorp

4.797 setup/0

- packs_common

4.798 shell/1

- osp

4.799 shell/2

- osp

4.800 shell_command/1

- docket

4.801 shrink/3

- arbitrary

4.802 shrink_sequence/3

- arbitrary

4.803 shrinker/1

- arbitrary

4.804 sign//1

- number_grammars(Format)

4.805 singletons/2

- temp

4.806 size/2

- dictionaryp
- heapp
- setp

4.807 skewness/2

- statisticsp

4.808 sleep/1

- osp

4.809 sort/2

- listp

4.810 sort/3

- listp

4.811 sort/4

- listp

4.812 source_file_extension/1

- modules_diagram_support

4.813 space//0

- blank_grammars(Format)

4.814 spaces//0

- blank_grammars(Format)

4.815 split/3

- atom

4.816 split/4

- listp

4.817 spy/1

- debuggerp

4.818 spy/3

- debuggerp

4.819 spy/4

- debuggerp

4.820 spy_point/4

- monitorp

4.821 spying/1

- debuggerp

4.822 spying/3

- debuggerp

4.823 spying/4

- debuggerp

4.824 standard_deviation/2

- statisticsp

4.825 start/0

- ports_profiler
- shell

4.826 start_redirect_to_file/2

- dump_trace

4.827 started_by/2

- intervalp

4.828 starts/2

- intervalp

4.829 stop/0

- ports_profiler

4.830 stop_redirect_to_file/0

- dump_trace

4.831 stream_to_bytes/2

- reader

4.832 stream_to_bytes/3

- reader

4.833 stream_to_chars/2

- reader

4.834 stream_to_chars/3

- reader

4.835 stream_to_codes/2

- reader

4.836 stream_to_codes/3

- reader

4.837 stream_to_terms/2

- reader

4.838 stream_to_terms/3

- reader

4.839 subclass/1

- class_hierarchy

4.840 subclasses/1

- class_hierarchy

4.841 sublist/2

- listp
- varlistp

4.842 subsequence/3

- listp

4.843 subsequence/4

- listp

4.844 subset/2

- setp

4.845 substitute/4

- listp

4.846 subsumes/2

- termp

4.847 subterm/2

- termp
- xml

4.848 subtract/3

- listp
- setp
- varlistp

4.849 succ/2

- integer

4.850 suffix/2

- listp
- varlistp

4.851 suffix/3

- listp

4.852 sum/2

- numberlistp
- statisticsp

4.853 superclass/1

- class_hierarchy

4.854 superclasses/1

- class_hierarchy

4.855 suspend_monitor/0

- monitorp

4.856 swap/2

- random_protocol

4.857 swap_consecutive/2

- random_protocol

4.858 symdiff/3

- setp

4.859 tab//0

- blank_grammars(Format)

4.860 tabs//0

- blank_grammars(Format)

4.861 take/3

- listp

4.862 temporary_directory/1

- osp

4.863 term_expansion/2

- expanding

4.864 terms_to_array/2

- java_utils_protocol

4.865 test/1

- lgtunit

4.866 time_stamp/1

- osp

4.867 timeout/1

- metagol

4.868 timestamp/2

- ulid_protocol

4.869 timestamp/8

- ulid_protocol

4.870 today/3

- datep

4.871 tolerance_equal/4

- lgtunit
- number

4.872 top/3

- heapp

4.873 top_next/5

- heapp

4.874 trace/0

- debuggerp

4.875 trace_event/2

- logtalk

4.876 transpose/2

- pairs

4.877 true/1

- java_utils_protocol

4.878 type/1

- type

4.879 unexpected/1

- expected(Expected)

4.880 unexpecteds/2

- either

4.881 uninstall/0

- packs

4.882 uninstall/1

- packs

4.883 uninstall/2

- packs

4.884 union/3

- setp

4.885 union/4

- setp
- union_find_protocol

4.886 union_all/3

- union_find_protocol

4.887 unpin/0

- packs_common

4.888 unpin/1

- packs_common

4.889 unzip/2

- zipperp

4.890 update/0

- doclet
- packs
- registries

4.891 update/1

- observer
- packs
- registries

4.892 update/2

- packs
- registries

4.893 update/3

- dictionaryp
- packs

4.894 update/4

- dictionaryp

4.895 update/5

- dictionaryp

4.896 update_in/4

- nested_dictionary_protocol

4.897 update_in/5

- nested_dictionary_protocol

4.898 uuid_null/1

- uuid_protocol

4.899 uuid_v1/2

- uuid_protocol

4.900 uuid_v4/1

- uuid_protocol

4.901 valid/1

- intervalp
- statisticsp
- temp
- varlistp

4.902 valid/2

- type

4.903 valid/3

- datep
- timep

4.904 valid_date/3

- iso8601

4.905 valid_option/1

- options_protocol

4.906 valid_options/1

- options_protocol

4.907 validate/1

- flags_validator

4.908 value/1

- counter

4.909 value/3

- pairs

4.910 value_reference/2

- java_utils_protocol

4.911 values/2

- dictionaryp
- pairs

4.912 variables/2

- temp

4.913 variance/2

- statisticsp

4.914 variant/2

- lgtunit
- temp

4.915 varnumbers/2

- temp

4.916 varnumbers/3

- temp

4.917 verify_commands_availability/0

- packs_common

4.918 version/6

- pack_protocol

4.919 versions/3

- packs

4.920 void/1

- java_utils_protocol

4.921 void_element/1

- html

4.922 wall_time/1

- osp

4.923 weighted_mean/3

- statisticsp

4.924 welcome/0

- shell

4.925 when/2

- coroutining

4.926 whiledo/2

- loopp

4.927 white_space//0

- blank_grammars(Format)

4.928 white_spaces//0

- blank_grammars(Format)

4.929 with_output_to/2

- term_io_protocol

4.930 without//2

- sequence_grammars

4.931 working_directory/1

- osp

4.932 write_file/3

- csv_protocol
- tsv_protocol

4.933 write_stream/3

- csv_protocol
- tsv_protocol

4.934 write_term_to_atom/3

- term_io_protocol

4.935 write_term_to_chars/3

- term_io_protocol

4.936 write_term_to_chars/4

- term_io_protocol

4.937 write_term_to_codes/3

- term_io_protocol

4.938 write_term_to_codes/4

- term_io_protocol

4.939 write_to_atom/2

- term_io_protocol

4.940 write_to_chars/2

- term_io_protocol

4.941 write_to_codes/2

- term_io_protocol

4.942 z_normalization/2

- statisticsp

4.943 zero_or_more//0

- sequence_grammars

4.944 zero_or_more//1

- sequence_grammars

4.945 zero_or_more//2

- sequence_grammars

4.946 zip/2

- zipperp

4.947 zip/3

- zipperp

4.948 zip_at_index/4

- zlist

INDICES AND TABLES

- genindex
- search

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Symbols

(/)/2, 351
 (//)/2, 352
 (<)/2, 838
 (<=)/2, 15, 537
 (:=)/2, 840
 (=<)/2, 839
 (=>)/2, 15, 538
 (=\\=)/2, 840
 (>)/2, 839
 (>=)/2, 839
 =~= / 2, 483, 879

A

a_star_interpreter(W), 939
 absolute_file_name/2, 628
 acc_info/5, 264
 acc_info/7, 264
 activate_debug_handler/1, 74
 activate_monitor/0, 276
 active_debug_handler/1, 73
 active_debug_handler_/1, 80
 add/1, 691
 add/2, 691
 add/3, 689, 843
 add_directive_/2, 981
 add_directive_/3, 982
 add_directive_before_entity_/2, 981
 add_library_documentation_url/4, 225
 add_link_options/3, 172
 add_node_zoom_option/4, 173
 addDependent/1, 149
 after/2, 408
 after/3, 82
 after_event_registry, 266
 all/0, 31, 116, 464
 all/1, 31, 116, 464
 all_files/0, 162, 186
 all_files/1, 162, 185
 all_libraries/0, 156, 179
 all_libraries/1, 156, 179
 all_score/1, 34
 ancestor/1, 369
 ancestor/4, 42
 ancestors/1, 369
 apis/0, 358
 apis/1, 358
 append/2, 854
 append/3, 719, 855, 912
 apply/2, 997
 apply/4, 255
 approximately_equal/2, 481, 877
 approximately_equal/3, 481, 877
 arbitrary, 1
 arbitrary/1, 4
 arbitrary/2, 4
 archive/1, 702
 arithmetic_mean/2, 782
 arithmetic_mean/5, 777
 array_list/2, 440
 array_to_list/2, 440
 array_to_terms/2, 439
 array_to_terms/3, 439
 as_curly_bracketed/2, 246, 596
 as_dictionary/2, 246
 as_difflist/2, 850
 as_heap/2, 346
 as_list/2, 246, 345, 720, 764, 843
 as_nested_dictionary/2, 596
 as_set/2, 764
 ask_question/5, 71
 assertion/1, 10, 476
 assertion/2, 10, 476
 assertions, 7
 assertions(Mode), 9
 assertions_messages, 11
 assignable/1, 14
 assignable/2, 14
 assignvars, 12
 assignvarsp, 13
 atom, 823
 atomic, 825
 automation_report, 465
 auxiliary_predicate_counter_/1, 514

available/0, 650
available/1, 649
available/2, 649
average/2, 884
average_deviation/3, 784
avltree, 240

B

backend_adapter_hook, 378
backend_random, 722
base64, 17
base64url, 19
base_/2, 317
before/2, 407
before/3, 82
before_event_registry, 267
bench_goal/1, 952
benchmark/2, 479
benchmark/3, 480
benchmark/4, 480
benchmark_generators, 941
benchmark_reified/3, 479
best_first, 942
between/3, 732, 847
bfs_interpreter, 944
binary_file_assertion/3, 510
binary_input_assertion/2, 494
binary_input_assertion/3, 494
binary_output_assertion/2, 505
binary_output_assertion/3, 504
binary_output_contents/1, 505
binary_output_contents/2, 505
bintree, 242
bit//1, 333
bits//1, 333
blank//0, 327
blank_grammars(Format), 323
blanks//0, 327
body_pred/1, 575
body_pred_call/2, 578
branch/2, 320
breakpoint_/2, 127
built_in_directive/4, 353
built_in_flag/2, 303
built_in_method/4, 353
built_in_non_terminal/4, 354
built_in_predicate/4, 353
bup_interpreter, 945

C

c/1, 949
calendar_month/3, 422
call_with_timeout/2, 802
call_with_timeout/3, 803

callable, 826
cat/2, 601
cbor, 21
cbor(StringRepresentation), 22
cc_metric, 24
cdata_generation//1, 990
change_directory/1, 631
changed/0, 148
changed/1, 148
character, 827
character_data_format/3, 990
characterp, 828
chebyshev_distance/3, 887
chebyshev_norm/2, 886
check/1, 901, 920
check/2, 909
check/3, 908
check_binary_file/2, 509
check_binary_input/1, 493
check_binary_input/2, 493
check_binary_output/1, 504
check_binary_output/2, 503
check_option/1, 616
check_options/1, 616
check_text_file/2, 508
check_text_file/3, 507
check_text_input/1, 490
check_text_input/2, 489
check_text_output/1, 498
check_text_output/2, 497
check_text_output/3, 497
chr_is/2, 805
chr_next_state/1, 808
chr_no_spy/1, 806
chr_nospy/0, 806
chr_notrace/0, 805
chr_option/2, 806
chr_option_allow_deep_guards/0, 808
chr_option_optimization_level/1, 807
chr_option_print_trace/0, 806
chr_option_show_history/0, 807
chr_option_show_id/0, 808
chr_option_show_stack/0, 807
chr_option_show_store/0, 807
chr_option_trace_interactive/0, 807
chr_rule_/1, 809
chr_spy/1, 805
chr_spy_point/1, 808
chr_trace/0, 805
class/1, 362
class_hierarchy, 359
class_hierarchyp, 361
classes/1, 362
clause/5, 712

clause_/5, 713
 clause_location/6, 711
 clause_location_/6, 712
 clean/0, 665, 696
 clean/1, 665, 696
 clean/2, 664
 clean_binary_input/0, 495
 clean_binary_output/0, 506
 clean_directory/1, 511
 clean_file/1, 510
 clean_text_input/0, 491
 clean_text_output/0, 501
 cleanup/0, 485
 clone/1, 532, 702
 clone/3, 247
 clone/4, 247
 cloning, 531
 closed_input_stream/2, 511
 closed_output_stream/2, 512
 code_metric, 25
 code_metrics, 38
 code_metrics_messages, 40
 code_metrics_utilities, 41
 coefficient_of_variation/2, 785
 command/2, 682
 command_line_arguments/1, 641
 commit_author/2, 320
 commit_date/2, 321
 commit_hash/2, 321
 commit_hash_abbreviated/2, 322
 commit_log/3, 322
 commit_message/2, 322
 comparingp, 837
 compile_aux_clauses/1, 77
 compile_predicate_heads/4, 78
 compile_predicate_indicators/3, 78
 compiled_pred_call/2, 577
 completion/2, 352
 completions/2, 352
 compound, 841
 condition/0, 485
 conditional_breakpoint_/3, 130
 connect/1, 757
 connect/3, 757
 console/1, 758
 contains/2, 410
 control//0, 328
 control_construct/4, 354
 controls//0, 329
 copy_file/2, 637
 core_messages, 62
 coroutining, 84
 counter, 946
 counter/2, 533, 589

counter_/2, 314, 535, 590
 counters, 532
 coupling_metric, 46
 cover/1, 472
 coverage_report, 466
 covered_/4, 516
 cpu_time/1, 109, 639
 create_binary_file/2, 507
 create_text_file/2, 507
 create_text_file/3, 506
 csv, 87
 csv(Header Separator IgnoreQuotes), 89
 csv_guess_questions, 90
 csv_protocol, 91
 current/2, 994
 current_entity/1, 42
 current_prog/1, 806

D

d2_graph_language, 150
 data/0, 709
 data/1, 710
 data/2, 710
 databasep, 949
 date, 102
 date/4, 414
 date/5, 415
 date/6, 416
 date/7, 417
 date_string/3, 418
 date_time/7, 639
 datep, 103
 days_in_month/3, 105
 deactivate_debug_handler/0, 74
 dead_code_scanner, 110
 dead_code_scanner_messages, 118
 debug/0, 135
 debug_expansion(Mode), 952
 debug_handler/1, 73
 debug_handler/3, 75
 debug_messages, 119
 debugger, 123
 debugger_messages, 132
 debuggerp, 133
 debugging/0, 136
 debugging/1, 136
 debugging_/0, 125
 decide/1, 297
 decide/2, 297
 declares_predicate/2, 43
 decode_exception/2, 442
 decode_exception/3, 442
 decode_url_spaces/2, 683
 decompile_predicate_heads/4, 79

decompile_predicate_indicators/4, 79
decompose_file_name/3, 628
decompose_file_name/4, 628
decrement_counter/1, 534
default_atom_mutations, 580
default_compound_mutations, 581
default_float_mutations, 583
default_integer_mutations, 584
default_list_mutations, 585
default_option/1, 618, 977
default_options/1, 618, 977
default_workflow_hook, 379
define_flag/1, 304
define_flag/2, 304
define_log_file/2, 547
defined/4, 689
defined_flag/6, 303
defined_flag_/6, 305
defines_predicate/2, 43
defines_predicate/3, 44
del_monitors/0, 272
del_monitors/4, 272
del_spy_points/4, 277
delete/0, 695
delete/1, 695
delete/2, 694
delete/3, 765, 855, 913
delete/4, 248, 344
delete_all_after/2, 1000
delete_all_after_and_unzip/2, 1000
delete_all_before/2, 999
delete_all_before_and_unzip/2, 1000
delete_and_next/2, 999
delete_and_previous/2, 998
delete_and_unzip/2, 999
delete_directory/1, 630
delete_directory_and_contents/1, 631
delete_directory_contents/1, 631
delete_file/1, 637
delete_in/4, 598
delete_matches/3, 855
delete_max/4, 253
delete_min/4, 253
demodb, 953
dependent_/1, 150
dependents/1, 149, 670
dependents/2, 669
dependents/3, 669
depth/2, 899
descendant/1, 370
descendant_class/1, 367
descendant_classes/1, 367
descendant_instance/1, 366
descendant_instances/1, 366
descendants/1, 370
describe/1, 655, 688
describe/2, 655
description/1, 644, 701
deterministic/1, 475
deterministic/2, 475
dfs_interpreter, 955
diagram(Format), 152
diagram_caption/3, 164
diagram_description/1, 163
diagram_name_suffix/1, 163
diagrams, 175
diagrams(Format), 176
dictionary, 244
dif, 258
dif/1, 85, 259
dif/2, 85, 259
difflist, 842
digit//1, 333
digits//1, 334
directories/1, 461, 974
directories/2, 158, 182, 460, 974
directories/3, 158, 181
directory/1, 29, 113, 160, 184, 462, 678, 974
directory/2, 28, 113, 160, 183, 461, 677, 973
directory/3, 160, 183
directory_dependency_diagram, 186
directory_dependency_diagram(Format), 188
directory_diagram(Format), 190
directory_entity_/4, 450
directory_exists/1, 634
directory_files/2, 633
directory_files/3, 634
directory_load_diagram, 193
directory_load_diagram(Format), 194
directory_score/2, 33
disable/1, 120
disable/2, 121
disable_logging/1, 549
disconnect/1, 757
disjoint/2, 765
disjoint_sets/2, 933
dit_metric, 48
doc_goal/1, 261
doc_metric, 49
doclet, 260
doctype/1, 398
document_generation//2, 989
dot//1, 336
dot_graph_language, 196
dowhile/2, 552
drop/3, 874
dump_trace, 143
during/2, 410

dynamic_directive_/3, 980

E

easter_day/3, 422
 edcg, 262
 edge/5, 168
 edge/6, 215
 edge_/5, 175
 edge_case/2, 5
 either, 280
 either/3, 292
 empty/1, 249, 345, 595, 603, 717, 766, 856, 913
 empty_map/1, 987
 enable/1, 120
 enable/2, 121
 enable_logging/1, 548
 enabled/1, 121
 enabled/2, 122
 enabled_/1, 122
 enabled_/2, 123
 ensure_directory/1, 635
 ensure_file/1, 638
 entity/1, 27, 112, 238, 355
 entity/2, 238
 entity_calls/3, 44
 entity_defines_/2, 713
 entity_diagram, 198
 entity_diagram(Format), 199
 entity_info_pair_score_hook/3, 51
 entity_info_score_hook/2, 51
 entity_kind/2, 44
 entity_predicates_weights_hook/2, 50
 entity_prefix/2, 77
 entity_property/2, 45
 entity_score/2, 32
 entity_updates/3, 45
 enumerate/2, 734
 environment_variable/2, 638
 epsilon/1, 483
 equal/2, 411, 765
 erase/1, 754
 essentially_equal/3, 482, 878
 euclidean_distance/3, 887
 euclidean_norm/2, 885
 event_registry, 268
 event_registryp, 269
 exception/4, 989
 exclude/3, 560
 execution_context/7, 80
 expand_library_alias_paths, 278
 expand_library_path/2, 75
 expanding, 63
 expected, 282
 expected(Expected), 287

expected/1, 290
 expecteds/2, 281
 explain//1, 822
 extension/1, 374
 extensions/1, 374
 external_predicate_/1, 240

F

f/4, 943
 failed_/3, 515
 false/1, 436
 fast_random, 723
 fault/5, 988
 fcube, 295
 fcube/0, 297
 file/1, 28, 112, 200, 463, 976
 file/2, 28, 112, 200, 463, 976
 file_being_advised_/4, 982
 file_dependency_diagram, 203
 file_dependency_diagram(Format), 204
 file_diagram(Format), 206
 file_exists/1, 635
 file_footer/3, 214
 file_header/3, 214
 file_line_hit_count_/3, 131
 file_load_diagram, 209
 file_load_diagram(Format), 210
 file_modification_time/2, 635
 file_path/2, 486
 file_permission/2, 636
 file_score/2, 33
 file_size/2, 636
 file_to_bytes/2, 743
 file_to_bytes/3, 743
 file_to_chars/2, 742
 file_to_chars/3, 742
 file_to_codes/2, 741
 file_to_codes/3, 741
 file_to_terms/2, 742
 file_to_terms/3, 743
 file_type_extension/2, 77
 files/1, 162, 185, 462, 975
 files/2, 161, 185, 462, 975
 files/3, 161, 184
 filter/2, 609
 filter_external_file_extension/3, 172
 filter_file_extension/3, 171
 find/4, 932
 find/5, 932
 findall_member/4, 560
 findall_member/5, 561
 finished_by/2, 411
 finishes/2, 411
 fired_/3, 516

- fix_option/2, 620
- fix_options/2, 620
- flag_group_chk/1, 302
- flag_groups/1, 302
- flag_value_/2, 305
- flags, 299
- flags_validator, 306
- flaky_/1, 516
- flat_map/2, 291, 610
- flatten/2, 856, 913
- flatten_goals//1, 957
- flatting, 956
- float, 844
- float//1, 335
- fold_left/4, 562
- fold_left_1/3, 562
- fold_right/4, 563
- fold_right_1/3, 564
- fordownto/3, 555
- fordownto/4, 555
- fordownto/5, 556
- foreach/3, 553
- foreach/4, 553
- format, 308
- format/2, 309
- format/3, 309
- format_entity_score//2, 34
- format_object/1, 163
- format_to_atom/3, 798
- format_to_chars/3, 799
- format_to_chars/4, 799
- format_to_codes/3, 800
- format_to_codes/4, 800
- forto/3, 554
- forto/4, 554
- forto/5, 554
- forward/1, 66
- forward/2, 996
- forward/3, 996
- forwarding, 65
- fractile/3, 787
- freeze/2, 86
- from_generator/2, 286, 605
- from_generator/3, 286, 604
- from_generator/4, 285
- from_goal/2, 285, 604
- from_goal/3, 284, 604
- from_goal/4, 284
- frozen/2, 86
- full_device_path/1, 633
- func_test/3, 576
- functional/0, 576

G

- generate/1, 403, 925
- generate/2, 18, 20, 23, 397, 448, 925
- generate/8, 925
- generated_predicate_/1, 570
- generating_/0, 521
- genint, 310
- genint/2, 313
- genint_core, 311
- gensym, 314
- gensym/2, 317
- gensym_core, 315
- geometric_mean/2, 782
- get/1, 610
- get_field/2, 430
- get_flag_value/2, 300
- get_seed/1, 6, 727
- git, 318
- git_protocol, 319
- gnu/0, 296
- goal_expansion/2, 64
- grammar_rules_hook, 380
- graph_footer/5, 214
- graph_header/5, 214
- graph_language_protocol, 212
- graph_language_registry, 216
- ground/1, 899
- ground_entity_identifier/3, 171
- group_by_key/2, 895
- group_consecutive_by_key/2, 895
- group_sorted_by_key/2, 894
- guess_arity/2, 101
- guess_separator/2, 100

H

- halstead_metric, 53
- halstead_metric(Stroud), 54
- hamming_distance/3, 857
- handbook/0, 357
- handbook/1, 357
- harmonic_mean/2, 782
- head/2, 717
- head_pred/1, 575
- heap(Order), 341
- heapp, 342
- help, 350
- help/0, 351, 675
- help_info_support, 356
- heuristic_expansion(Mode), 957
- hex_digit//1, 334
- hex_digits//1, 334
- hierarchyp, 368
- home/1, 645, 701
- hook_pipeline(Pipeline), 375

hook_set(Set), 376
 html, 396
 html5, 399

I

ibk/3, 575
 iddfs_interpreter(Increment), 959
 identity_hook, 381
 ids, 401
 ids(Representation Bytes), 402
 if_empty/1, 608
 if_expected/1, 289
 if_expected_or_else/2, 290
 if_present/1, 608
 if_present_or_else/2, 608
 if_unexpected/1, 289
 include/3, 560
 included_directory_/1, 192
 included_entity_/1, 201
 included_file_/1, 208
 included_library_/2, 226
 included_module_/1, 201
 included_predicate_/1, 239
 increase/1, 947
 increment/0, 947
 increment_counter/1, 533
 inheritance_diagram, 217
 inheritance_diagram(Format), 218
 init/0, 969
 init_log_file/2, 547
 inorder/2, 243
 insert/3, 766
 insert/4, 248, 343
 insert_after/3, 998
 insert_all/3, 344, 766
 insert_before/3, 997
 insert_in/4, 598
 install/1, 659
 install/2, 658
 install/3, 657
 install/4, 656
 installed/0, 652
 installed/1, 651
 installed/3, 651
 installed/4, 650
 instance/1, 363
 instance/2, 754
 instances/1, 363
 integer, 845
 integer//1, 335
 internal_os_path/2, 629
 interpreterp, 960
 intersect/2, 767
 intersection/2, 251
 intersection/3, 251, 767
 intersection/4, 767
 interval, 404
 intervalp, 405
 invocation_number_/1, 128
 invoke/1, 431
 invoke/2, 432
 ip_grammars(Format), 329
 ipv4//1, 330
 ipv6//1, 331
 is_absolute_file_name/1, 627
 is_alpha/1, 830
 is_alphanumeric/1, 830
 is_ascii/1, 830
 is_bin_digit/1, 831
 is_control/1, 835
 is_dec_digit/1, 832
 is_empty/0, 607
 is_end_of_line/1, 836
 is_expected/0, 288
 is_false/1, 437
 is_hex_digit/1, 832
 is_layout/1, 834
 is_letter/1, 831
 is_lower_case/1, 832
 is_newline/1, 835
 is_null/1, 438
 is_object/1, 438
 is_octal_digit/1, 831
 is_period/1, 835
 is_present/0, 607
 is_punctuation/1, 834
 is_quote/1, 834
 is_true/1, 437
 is_unexpected/0, 288
 is_upper_case/1, 833
 is_validator/1, 306
 is_void/1, 437
 is_vowel/1, 833
 is_white_space/1, 833
 iso8601, 412
 issue_creator, 424
 iterator_element/2, 441

J

java, 425
 java(Reference), 426
 java(Reference ReturnValue), 427
 java_access_protocol, 429
 java_hook, 432
 java_utils_protocol, 434
 join/3, 717
 join_all/3, 718
 json, 443

- json(ObjectRepresentation PairRepresentation StringRepresentation) diagram(Format), 229
 - 445
 - json(StringRepresentation), 444
 - json_protocol, 447
 - jump/3, 718
 - jump_all/3, 718
 - jump_all_block/3, 719
 - jump_to_invocation_number_/1, 129
- ## K
- key/2, 893
 - keys/2, 254, 892
 - keys_values/3, 892
 - keysort/2, 857
 - kurtosis/2, 786
- ## L
- language_object/2, 217
 - last/2, 857, 914
 - leaf/1, 369
 - leaf_class/1, 365
 - leaf_classes/1, 366
 - leaf_instance/1, 365
 - leaf_instances/1, 365
 - leap_year/1, 104, 421
 - leaping_/1, 126
 - learn/0, 579
 - learn/1, 579
 - learn/2, 573
 - learn/3, 573
 - learn_seq/2, 573
 - learn_with_timeout/4, 574
 - leash/1, 137
 - leashing/1, 137
 - leashing_/1, 128
 - least_common_multiple/2, 890
 - leaves/1, 370
 - length/2, 719, 858, 914
 - lgtdoc, 449
 - lgtdoc_messages, 452
 - lgtdocp, 453
 - lgtunit, 468
 - lgtunit_messages, 517
 - libraries/1, 155, 179, 457
 - libraries/2, 155, 178, 457
 - libraries/3, 155, 178
 - library/0, 354
 - library/1, 30, 115, 157, 181, 355, 458
 - library/2, 30, 114, 157, 180, 458
 - library_dependency_diagram, 220
 - library_dependency_diagram(Format), 221
 - library_diagram(Format), 223
 - library_entity_/4, 450
 - library_load_diagram, 227
 - library_score/2, 32
 - license/1, 644
 - line_to_chars/2, 747
 - line_to_chars/3, 747
 - line_to_codes/2, 747
 - line_to_codes/3, 748
 - lint/0, 672, 698
 - lint/1, 671, 697
 - lint/2, 671
 - list, 849
 - list(Type), 851
 - list/0, 688
 - list_to_array/2, 440
 - listing, 539
 - listing/0, 540
 - listing/1, 540
 - listp, 852
 - load_registry/1, 682
 - loaded_file/1, 75
 - loaded_file_property/2, 76, 232
 - locate_directory/2, 170
 - locate_file/5, 171
 - locate_library/2, 170
 - log/3, 142
 - log_event/2, 548
 - log_file/2, 547
 - log_file_/2, 543, 545
 - log_point_/3, 130
 - logger, 542
 - logging, 544
 - logging/1, 548
 - logging/3, 142
 - logging_to_file_/2, 543, 545
 - loggingp, 546
 - logtalk, 67
 - logtalk_packs/0, 680
 - logtalk_packs/1, 679
 - lookup/2, 250
 - lookup/3, 250
 - lookup_in/3, 596
 - loop, 550
 - loopp, 551
 - lower_upper/2, 837
- ## M
- magic, 962
 - magic/2, 963
 - magic_expansion(Mode), 964
 - magicise/4, 963
 - make/1, 486
 - make_directory/1, 629
 - make_directory_path/1, 630
 - make_set/3, 931

man/1, 359
 manhattan_distance/3, 887
 manhattan_norm/2, 886
 manuals/0, 355
 map/2, 254, 291, 565, 609, 720
 map/3, 255, 565, 721, 895
 map/4, 566
 map/5, 566
 map/6, 567
 map/7, 567
 map/8, 567
 map_element/2, 441
 map_member/3, 987
 map_reduce/5, 568
 map_store/4, 988
 max/2, 781, 858, 883
 max/3, 252
 max_clauses/1, 576
 max_inv_preds/1, 576
 max_size/1, 7
 maxheap, 347
 maybe, 600
 maybe/0, 737
 maybe/1, 737
 maybe/2, 738
 maybe_call/1, 738
 maybe_call/2, 738
 mean_deviation/2, 784
 median/2, 783, 885
 median_deviation/2, 785
 meets/2, 408
 member/2, 732, 768, 858
 memberchk/2, 769, 859, 914
 merge/3, 344
 merge_options/2, 619, 978
 message_cache_/1, 525, 527, 528, 530
 message_diagram_description/1, 174
 message_hook/4, 71
 message_prefix_file/6, 71
 message_prefix_stream/4, 70
 message_tokens//2, 70
 met_by/2, 408
 meta, 557
 meta_compiler, 569
 meta_type/3, 908
 metagol, 571
 metagol_example_protocol, 578
 metap, 558
 metarule/6, 575
 metarule_next_id/1, 577
 min/2, 780, 859, 883
 min/3, 252
 min_clauses/1, 576
 min_max/3, 781, 883

minheap, 348
 minimal_output, 518
 missing_predicate_directive_/3, 980
 modes/2, 783, 885
 module_predicate_called_/3, 979
 module_property/2, 232
 modules_diagram_support, 231
 monitor, 273
 monitor/1, 271
 monitor/4, 271
 monitor_activated/0, 276
 monitored/1, 271
 monitoring, 81
 monitorp, 274
 monitors/1, 270
 msort/2, 859
 msort/3, 860
 multifile_directive_/3, 981
 mutation/3, 588, 589
 mutation/4, 590
 mutations, 587
 mutations_store, 588

N

name/1, 644, 701
 name_of_day/3, 105
 name_of_month/3, 105
 natural, 875
 natural//1, 335
 navltree, 591
 nbintree, 592
 nested_dictionary_protocol, 594
 new/1, 431, 537, 595, 899
 new/2, 431, 537, 931
 new/3, 407
 new_line//0, 326
 new_lines//0, 327
 next/2, 994
 next/3, 994
 next/4, 252
 nextto/3, 860, 915
 noc_metric, 56
 node/6, 167
 node/7, 215
 node_/6, 174
 node_path_/2, 174
 nodebug/0, 135
 nolog/3, 142
 nologall/0, 143
 non_blank//1, 328
 non_blanks//1, 328
 non_standard_predicate_call_/2, 980
 nor_metric, 58
 normal_element/2, 398

normalize_range/2, 888
normalize_range/4, 888
normalize_scalar/2, 889
normalize_unit/2, 889
nospy/1, 139
nospy/3, 140
nospy/4, 141
nospyall/0, 141
not_excluded_file/3, 45
not_excluded_file/4, 169
note/1, 486
note/2, 702
note/3, 646
notrace/0, 137
now/3, 109
nrbtree, 599
nth0/3, 861, 915
nth0/4, 861, 915
nth1/3, 861, 916
nth1/4, 862, 916
null/1, 436
null_device_path/1, 632
number, 876
number//1, 336
number_grammars(Format), 331
number_of_tests/1, 474
numberlist, 880
numberlistp, 881
numbervars/1, 903
numbervars/3, 903

O

object_file_/2, 467
object_predicate_called_/3, 979
object_wrapper_hook, 383
object_wrapper_hook(Name Relations), 385
object_wrapper_hook(Protocol), 384
observer, 145
occurrences/2, 863
occurrences/3, 863
occurs/2, 900
of/2, 603
of_expected/2, 284
of_unexpected/2, 283
omit_path_prefix/3, 173
one_or_more//0, 340
one_or_more//1, 339
one_or_more//2, 338
operating_system_machine/1, 641
operating_system_name/1, 640
operating_system_release/1, 641
operating_system_type/1, 640
option/2, 618
option/3, 619

optional, 602
optional(Optional), 606
options, 613
options_protocol, 615
or/2, 610
or_else/2, 292, 611
or_else_call/2, 293, 612
or_else_fail/1, 294, 612
or_else_get/2, 293, 611
or_else_throw/1, 294
or_else_throw/2, 613
orphaned/0, 654
orphaned/2, 653
os, 621
os_types, 623
osp, 624
outdated/0, 653
outdated/1, 652
outdated/4, 652
output_edges/1, 168
output externals/1, 165
output_file/4, 166
output_file_name/2, 213
output_file_path/4, 170
output_files/2, 166
output_library/3, 165
output_missing externals/1, 169
output_node/6, 167
output_rdirectory/3, 165
output_rlibrary/3, 164
output_sub_diagrams/1, 166
overlapped_by/2, 409
overlaps/2, 409

P

pack_protocol, 642
packs, 647
packs_common, 672
packs_messages, 684
packs_specs_hook, 685
pairs, 891
parent/1, 373
parenthesis/2, 836
parents/1, 373
parse/2, 18, 20, 23, 448, 985
parse/3, 985
parse_domain/2, 704
parse_domain/3, 704
parse_problem/2, 705
parse_problem/3, 705
partial_/1, 521, 523
partial_map/4, 257
partition/3, 281
partition/4, 561, 762

partition/5, 864
 partition/6, 561
 pass_info/1, 265
 pass_info/2, 265
 passed_/3, 515
 path_concat/3, 629
 pcd_data_7bit//1, 990
 pddl, 703
 permutation/2, 734, 864, 917
 pid/1, 626
 pin/0, 676
 pin/1, 675
 pinned/1, 677
 plus/3, 847
 population, 773
 port/5, 711
 port_/5, 713
 portray_clause/1, 541
 ports_profiler, 707
 postorder/2, 243
 powerset/2, 769
 pp/1, 986
 pp_string/1, 988
 pprint/1, 574
 pprint_clause/1, 577
 pprint_clauses/1, 577
 pred_info/3, 264
 predicate/2, 117
 predicate_called_but_not_defined_/2, 978
 predicate_entity_/4, 451
 predicate_info_pair_score_hook/4, 53
 predicate_info_score_hook/3, 52
 predicate_mode_score_hook/3, 51
 predicate_mode_score_hook/5, 52
 predicates/2, 116
 prefix/0, 681
 prefix/1, 680
 prefix/2, 864, 917
 prefix/3, 865
 preorder/2, 243
 previous/2, 995
 previous/3, 995
 previous/4, 251
 print_flags/0, 302, 307
 print_flags/1, 303
 print_goal_hook, 387
 print_message/3, 69
 print_message_token/4, 70
 print_message_tokens/3, 69
 print_readme_file_path/1, 681
 process_all/1, 37
 process_directory/2, 36
 process_entity/2, 35
 process_file/2, 35

process_library/2, 36
 process_rdirectory/2, 36
 process_rlibrary/2, 37
 product/2, 780, 884
 product/3, 769
 program_to_clauses/2, 574
 prolog_module_hook(Module), 388
 proper_prefix/2, 865
 proper_prefix/3, 866
 proper_suffix/2, 873
 proper_suffix/3, 873
 proto_hierarchy, 371
 proto_hierarchyp, 372
 prove/2, 961
 prove/3, 961
 provides/2, 697
 pseudo_random_protocol, 726

Q

quasi_skipping_/0, 126
 question_hook/6, 72
 question_prompt_stream/4, 72
 queue, 714
 queuep, 715
 quick_check/1, 478
 quick_check/2, 477
 quick_check/3, 477

R

random, 728
 random/1, 732
 random/3, 736
 random_node/1, 939
 random_protocol, 730
 random_tree/1, 942
 randomize/1, 725, 729
 randseq/4, 736
 randset/4, 736
 range/2, 781
 rbtree, 256
 rdirectories/1, 459
 rdirectories/2, 459
 rdirectory/1, 29, 114, 159, 183, 460, 973
 rdirectory/2, 29, 114, 159, 182, 459, 973
 rdirectory/3, 159, 182
 rdirectory_score/2, 34
 read_file, 706
 read_file/2, 94, 707, 814
 read_file/3, 93, 813
 read_file_by_line/2, 97, 817
 read_file_by_line/3, 96, 816
 read_from_atom/2, 792
 read_from_chars/2, 794
 read_from_codes/2, 795

read_only_device_path/1, 633
read_stream/2, 95, 815
read_stream/3, 93, 813
read_stream_by_line/2, 98, 818
read_stream_by_line/3, 97, 817
read_term_from_atom/3, 792
read_term_from_chars/3, 793
read_term_from_chars/4, 793
read_term_from_codes/3, 794
read_term_from_codes/4, 794
reader, 739
readme/1, 679
readme/2, 678
readme_file_path/2, 681
record_/3, 755
recorda/2, 751
recorda/3, 751
recorded/2, 753
recorded/3, 753
recorded_database, 749
recorded_database_core, 750
recordz/2, 752
recordz/3, 752
redis, 756
reference_/1, 755
referenced_entity_/2, 202
referenced_logtalk_directory_/1, 192
referenced_logtalk_file_/1, 208
referenced_logtalk_library_/2, 226
referenced_module_/2, 202
referenced_predicate_/1, 239
referenced_prolog_directory_/1, 193
referenced_prolog_file_/1, 209
referenced_prolog_library_/2, 227
registries, 686
registry_loader_hook, 698
registry_protocol, 699
relative_standard_deviation/2, 786
remember_included_directory/1, 191
remember_included_file/1, 207
remember_included_library/2, 225
remember_referenced_logtalk_directory/1, 191
remember_referenced_logtalk_file/1, 207
remember_referenced_logtalk_library/2, 225
remember_referenced_prolog_directory/1, 192
remember_referenced_prolog_file/1, 208
remember_referenced_prolog_library/2, 226
remove_directive_/2, 982
remove_duplicates/2, 866, 917
removeDependent/1, 149
rename_file/2, 637
replace/3, 998
replace_sub_atom/4, 824
rescale/3, 890
reset/0, 135, 167, 674, 710, 948
reset/1, 711
reset_counter/1, 534
reset_counters/0, 534
reset_flags/0, 301
reset_flags/1, 301
reset_genint/0, 313
reset_genint/1, 313
reset_gensym/0, 316
reset_gensym/1, 316
reset_monitor/0, 276
reset_seed/0, 724, 729
restore/1, 668
restore/2, 667
reverse/2, 866, 918
rewind/2, 995
rewind/3, 996
rlibraries/1, 455
rlibraries/2, 455
rlibrary/1, 31, 115, 157, 180, 456
rlibrary/2, 30, 115, 156, 180, 456
rlibrary_score/2, 32
rule/2, 951
rule/3, 951
rule/4, 951
rule_expansion(Mode), 965
run/0, 472
run/1, 473
run/2, 473
run_quick_check_tests/5, 484
run_test_set/0, 484
run_test_sets/1, 474
run_tests/0, 484
run_tests/1, 484
running_test_sets_/0, 513

S

same_length/2, 867, 918
same_length/3, 867
sample, 774
save/0, 977
save/1, 667, 976
save/2, 666
save_edge/5, 168
scalar_product/3, 888
scan_left/4, 563
scan_left_1/3, 563
scan_right/4, 564
scan_right_1/3, 565
search/1, 656
seed_/3, 725, 730
select/3, 733, 770, 867, 918
select/4, 733, 868
selectchk/3, 770, 868

selectchk/4, 868
 selected_test_/1, 514
 send/3, 758
 sequence/3, 848
 sequence/4, 735, 848
 sequence_grammars, 337
 sequential_occurrences/2, 862
 sequential_occurrences/3, 862
 serve/3, 720
 set, 759
 set(Type), 760
 set/1, 948
 set/4, 735
 set_binary_input/1, 492
 set_binary_input/2, 492
 set_binary_input/3, 491
 set_binary_output/1, 503
 set_binary_output/2, 502
 set_binary_output/3, 502
 set_element/2, 441
 set_field/2, 430
 set_flag_value/2, 300
 set_flag_value/3, 301
 set_monitor/4, 272
 set_seed/1, 6, 727
 set_spy_point/4, 277
 set_text_input/1, 489
 set_text_input/2, 488
 set_text_input/3, 488
 set_text_output/1, 496
 set_text_output/2, 496
 set_text_output/3, 495
 setp, 762
 setup/0, 485, 674
 shell, 966
 shell(Interpreters), 968
 shell/1, 627
 shell/2, 627
 shell_command/1, 261
 shell_expansion(Mode), 969
 shrink/3, 5
 shrink_sequence/3, 5
 shrinker/1, 4
 sign//1, 336
 singletons/2, 902
 size/2, 255, 345, 768
 size_metric, 59
 skewness/2, 786
 skipped_/1, 515
 skipping_/0, 125
 skipping_unleashed_/1, 126
 sleep/1, 642
 sort/2, 762, 869
 sort/3, 869
 sort/4, 870
 source_file_extension/1, 232
 space//0, 325
 spaces//0, 325
 split/3, 824
 split/4, 870
 spy/1, 138
 spy/3, 139
 spy/4, 140
 spy_point/4, 277
 spy_point_/4, 274
 spying/1, 138
 spying/3, 139
 spying/4, 140
 spying_context_/4, 128
 spying_predicate_/3, 127
 squares_and_cubes/6, 777
 squares_and_hypers/6, 777
 standard_deviation/2, 785
 start/0, 709, 967
 start_redirect_to_file/2, 144
 started_by/2, 410
 starts/2, 409
 statistics, 775
 statisticsp, 778
 stop/0, 709
 stop_redirect_to_file/0, 145
 stream_position/1, 512
 stream_to_bytes/2, 746
 stream_to_bytes/3, 746
 stream_to_chars/2, 744
 stream_to_chars/3, 745
 stream_to_codes/2, 744
 stream_to_codes/3, 744
 stream_to_terms/2, 745
 stream_to_terms/3, 746
 streamvars, 535
 sub_diagram_/1, 205, 212, 223, 230
 sub_diagram_/2, 189, 196
 sub_directory/2, 37
 sub_library/2, 38
 subclass/1, 363
 subclasses/1, 364
 subject, 147
 sublist/2, 870, 919
 subsequence/3, 871
 subsequence/4, 871
 subset/2, 770
 substitute/4, 872
 subsumes/2, 900
 subterm/2, 900, 986
 subtract/3, 771, 872, 919
 succ/2, 847
 suffix/2, 872, 919

suffix/3, 873
sum/2, 780, 884
superclass/1, 364
superclasses/1, 364
supported_archive/1, 683
supported_editor_url_scheme_prefix/1, 172
supported_url_archive/1, 683
suppress_binary_output/0, 487
suppress_goal_hook, 389
suppress_text_output/0, 487
suspend_monitor/0, 276
swap/2, 733
swap_consecutive/2, 734
syndiff/3, 771

T

tab//0, 326
tabs//0, 326
take/3, 874
tap_output, 519
tap_report, 522
tar_command/1, 682
temporary_directory/1, 632
temporary_file_/1, 790
term, 896
term_expansion/2, 64
term_io, 789
term_io_protocol, 790
termp, 897
terms_to_array/2, 438
test/1, 474
test/2, 513
test/3, 513
test_/2, 514
test_count_/1, 521, 523
text_file_assertion/3, 509
text_file_assertion/4, 508
text_input_assertion/2, 491
text_input_assertion/3, 490
text_output_assertion/2, 499
text_output_assertion/3, 499
text_output_assertion/4, 498
text_output_contents/1, 501
text_output_contents/2, 500
text_output_contents/3, 500
time, 107
time_stamp/1, 638
timeout, 801
timeout/1, 577
timep, 108
timestamp/2, 926
timestamp/8, 926
timestamp_/6, 467
today/3, 104

tolerance_equal/4, 482, 878
top/3, 346
top_next/5, 346
toychrdb, 803
trace/0, 136
trace_event/2, 73
tracing_/0, 125
transpose/2, 894
triggered_breakpoint_/4, 130
triggered_breakpoint_enabled_/2, 131
true/1, 435
tsv, 809
tsv(Header), 810
tsv_protocol, 811
tutor, 821
type, 904
type/1, 907
type/3, 578
type_entity_/4, 451

U

ulid, 921
ulid(Representation), 922
ulid_protocol, 923
ulid_types, 927
unexpected/1, 290
unexpecteds/2, 281
uninstall/0, 664
uninstall/1, 663
uninstall/2, 662
union/3, 771
union/4, 772, 931
union_all/3, 932
union_find, 928
union_find_protocol, 929
unknown_predicate_called_/2, 979
unpin/0, 676
unpin/1, 676
unsafe_set_flag_value/2, 304
unzip/2, 993
update/0, 261, 662, 694
update/1, 146, 662, 693
update/2, 660, 692
update/3, 249, 659
update/4, 248
update/5, 249
update_in/4, 597
update_in/5, 597
upn_metric, 61
user, 83
uses_diagram, 233
uses_diagram(Format), 234
uuid, 934
uuid(Representation), 935

uuid_null/1, 938
 uuid_protocol, 936
 uuid_v1/2, 938
 uuid_v4/1, 938

V

valid/1, 407, 788, 901, 920
 valid/2, 908
 valid/3, 106, 109
 valid_date/3, 420
 valid_option/1, 617
 valid_options/1, 617
 validate/1, 307
 validate/3, 306
 validate_type/1, 306
 value/1, 948
 value/3, 893
 value_reference/2, 435
 values/2, 254, 893
 variables/2, 902
 variance/2, 787
 variance/6, 778
 variant/2, 480, 901
 varlist, 910
 varlistp, 911
 varnumbers/2, 904
 varnumbers/3, 903
 verify_commands_availability/0, 675
 version/6, 645
 versions/3, 654
 void/1, 436
 void_element/1, 397

W

wall_time/1, 639
 weighted_mean/3, 783
 welcome/0, 967
 when/2, 87
 whiledo/2, 552
 white_space//0, 325
 white_spaces//0, 325
 with_output_to/2, 800
 without//2, 340
 working_directory/1, 632
 wrapper, 970
 write_file/3, 99, 819
 write_max_depth_/1, 129
 write_stream/3, 99, 819
 write_term_to_atom/3, 795
 write_term_to_chars/3, 796
 write_term_to_chars/4, 796
 write_term_to_codes/3, 797
 write_term_to_codes/4, 798
 write_to_atom/2, 796

write_to_chars/2, 797
 write_to_codes/2, 798
 write_to_file_hook(File), 391
 write_to_file_hook(File Options), 392
 write_to_stream_hook(Stream), 393
 write_to_stream_hook(Stream Options), 395

X

xhtml11, 400
 xml, 983
 xml_to_document/3, 987
 xref_diagram, 236
 xref_diagram(Format), 237
 xunit_net_v2_output, 524
 xunit_net_v2_report, 526
 xunit_output, 527
 xunit_report, 529

Z

z_normalization/2, 787
 zap_to_port_/1, 129
 zero_or_more//0, 340
 zero_or_more//1, 339
 zero_or_more//2, 338
 zip/2, 993
 zip/3, 993
 zip_at_index/4, 1002
 zipperp, 991
 zlist, 1001