

A Runtime Comparisons

Table 1. Performance of EGS, SCYTHE, ILASP, and PROSYNTH on 20 knowledge discovery benchmarks.

Benchmark	EGS	Scythe	ILASP <i>Task-Agnostic Rule Set</i>	ILASP <i>Task-Specific Rule Set</i>	ProSynth <i>Task-Agnostic Rule Set</i>	ProSynth <i>Task-Specific Rule Set</i>	#Rules <i>Task-Agnostic</i>	#Rules <i>Task-Specific</i>
<i>Knowledge Discovery</i>								
abduce	0.4	–	–	6.1	–	–	–	4917
adjacent-to-red	0.4	1.5	365.7	0.3	–	0.8	209799	101
agent	0.8	–	–	0.3	–	1.8	–	142
animals	0.4	–	–	–	–	–	1242184	2000
cliquer	0.3	0.7	1.0	0.2	–	0.7	1484	79
contains	0.3	0.8	176.1	0.2	–	0.1	7557	1
grandparent	0.5	–	–	5.9	–	–	–	4917
graph-coloring	0.4	5.2	177.2	0.1	–	0.3	96079	23
headquarters	0.3	0.7	11.2	0.2	–	0.1	4057	1
inflammation	0.6	–	–	3.0	–	–	–	847
kinship	0.5	–	–	5.8	–	–	–	4917
predecessor	0.2	1.7	1.2	0.2	–	0.1	1484	5
reduce	0.3	0.7	114.8	0.1	–	0.1	7557	1
scheduling	0.4	1.5	336.7	0.1	–	0.2	160016	16
sequential	0.8	–	–	–	–	–	–	–
ship	0.3	1.3	–	1.2	–	–	–	1426
son	0.3	1.1	–	1.0	–	–	–	1199
traffic	0.5	6.5	143.9	0.3	–	0.7	93326	97
trains	0.4	–	–	3.3	–	–	–	601
undirected-edge	0.3	1.0	1.3	0.2	–	0.3	1484	79

Table 2. Performance of EGS, SCYTHE, ILASP, and PROSYNTH on 18 program analysis benchmarks.

Benchmark	EGS	Scythe	ILASP <i>Task-Agnostic Rule Set</i>	ILASP <i>Task-Specific Rule Set</i>	Prosynth <i>Task-Agnostic Rule Set</i>	Prosynth <i>Task-Specific Rule Set</i>	#Rules <i>Full</i>	#Rules <i>Task-Specific</i>
<i>Program Analysis</i>								
arithmetic-error	0.2	1.0	–	0.1	–	0.1	263853	13
block-succ	0.4	–	–	9.9	–	–	–	9758
callsize	0.3	1.2	20.2	0.2	–	0.4	14446	11
cast-immutable	0.3	1.2	420.0	0.1	–	0.1	225108	18
downcast	1.8	–	–	–	–	–	–	3392
increment-float	0.3	1.6	58.5	0.1	–	0.1	19594	10
int-field	0.3	0.5	–	0.3	–	0.2	–	109
modifies-global	0.3	0.7	23.3	0.1	–	0.1	17679	6
mutual-recursion	0.3	1.3	1.2	0.2	–	0.1	1484	25
nested-loops	2.9	–	–	1.1	–	–	–	1053
overrides	0.3	1.2	–	1.6	–	–	–	1804
polysite	3.8	–	–	–	–	–	–	1025
pyfunc-mutable	0.4	2.0	17.0	0.2	–	0.1	12185	6
reach	0.3	1.0	545.3	0.3	–	0.2	256549	15
reaching-def	0.2	0.8	–	0.3	–	0.1	–	8
realloc-misuse	0.4	–	–	0.1	–	0.2	669744	22
rvcheck	0.6	–	–	29.0	–	–	–	20186
shadowed-var	0.3	1.8	–	0.3	–	0.2	13291	38

Table 3. Performance of EGS, SCYTHE, ILASP, and PROSYNTH on 41 database querying tasks.

Benchmark	EGS	Scythe	ILASP <i>Task-Agnostic Rule Set</i>	ILASP <i>Task-Specific Rule Set</i>	Prosynth <i>Task-Agnostic Rule Set</i>	Prosynth <i>Task-Specific Rule Set</i>	#Rules <i>Task-Agnostic</i>	#Rules <i>Task-Specific</i>
<i>Relational Queries</i>								
sql01	0.4	1.4	108.3	0.3	–	2.7	82475	200
sql02	0.2	1.5	21.0	0.3	–	1.9	22073	212
sql03	0.4	4.7	–	1.2	–	22.6	381295	752
sql04	0.4	3.3	–	0.2	–	0.1	763408	2
sql05	0.2	2.5	4.6	0.2	–	0.1	1571	1
sql06	0.3	1.2	–	0.5	–	0.1	–	21
sql07	0.6	3.7	–	0.2	–	0.3	258271	36
sql08	0.3	–	21.4	0.1	–	0.1	14415	11
sql09	0.4	2.1	–	0.4	–	0.1	–	8
sql10	0.3	8.4	1.4	0.1	2.8	0.1	331	1
sql11	0.2	49.7	40.8	0.2	–	0.1	14415	11
sql12	0.3	4.1	–	0.2	–	0.1	–	2
sql13	0.3	3.0	–	0.1	–	0.1	86032	3
sql14	0.4	2.3	–	0.2	–	0.1	182739	8
sql15	0.6	2.4	–	1.1	–	–	–	1461
sql16	0.4	10.4	–	0.6	–	0.1	–	3
sql17	0.3	4.8	–	0.2	–	0.1	187020	2
sql18	0.2	2.1	31.9	0.1	–	0.1	14403	1
sql19	0.5	3.1	–	1.7	–	–	–	1832
sql20	0.2	1.5	0.8	0.2	5.5	0.1	344	1
sql21	0.3	3.5	325.0	0.1	–	0.1	86032	3
sql22	1.9	6.3	92.5	0.2	–	1.1	54821	51
sql23	0.3	6.3	–	0.1	–	0.1	2037	2
sql24	0.2	1.4	10.9	0.1	–	0.1	1958	2
sql25	0.4	17.0	13.4	0.1	–	0.3	8946	9
sql26	0.3	14.7	11.2	0.1	–	0.1	4445	4
sql27	0.5	5.9	22.6	0.1	–	0.2	13810	18
sql28	0.3	8.2	403.5	0.2	–	0.1	181232	22
sql29	0.3	1.0	–	0.3	–	0.2	–	76
sql30	0.3	3.1	–	0.3	–	0.1	763408	2
sql31	0.4	2.1	73.1	0.2	–	2.5	53813	166
sql32	0.3	17.0	418.3	0.1	–	0.1	225108	18
sql33	0.4	2.8	–	4.6	–	–	–	6632
sql34	0.2	3.2	540.3	0.1	–	0.1	225108	18
sql35	0.7	–	–	0.5	–	0.1	–	4
sql36	32.6	199.8	–	–	–	–	–	247986
sql37	0.7	12.7	–	–	–	–	–	–
sql38	0.5	–	22.0	0.3	–	0.2	13810	18
sql39	6.8	11.7	–	4.9	–	1.7	–	325
sql40	0.3	6.5	–	–	–	–	–	559577
sql41	0.2	3.9	–	0.1	–	0.1	–	44