DLP

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DLP:
The tests were performed using the 1 March 1998 version of DLP, modified to allow for incoherent concept definitions. DLP is an experimental description logic classifier whose subsumption reasoning uses a sound and complete tableaux algorithm. DLP employs a wide range of optimisations, including normalization, backjumping, and caching. DLP is written in ML, in a mostly-functional style.

DLP has many configurable options. All the tests were run using one setting for these options.

Availability:
The sources for DLP are available from:
http://www-db.research.bell-labs.com/user/pfps.

Advantages:
DLP is written in ML, a freely-available programming language that runs on various systems. DLP has several interfaces, including one for proving theorems in various propositional modal logics, such as propositional dynamic logic.

Hardware and Software:
SPARC Ultra 1; main memory 64MB; Model 140 UltraSPARC CPU; Solaris 2.5.1; SML-NJ compiler, version 110.

Timing was done using the internal CPU timing built into SML-NJ.

Results:
Note that DLP ignores some of the constructs in the realistic Tbox tests, notably role hierarchies, defined roles, disjointness, and qualified number restrictions. Therefore, the knowledge bases “ckb”, “datamont”, “espr”, “fss”, and “wisber” were processed in their atomic role forms.

Table 3: Random Tbox Classification Tests

Test	Concepts	Time (s)	Correct
kris151	16	0.030	Y
kris301	31	0.060	Y
kris451	46	0.090	Y
kris601	61	0.160	Y
kris751	76	0.170	Y
kris901	91	0.410	Y
kris1051	106	0.340	Y
kris1201	121	0.340	Y
kris1351	136	0.520	Y
kris1501	151	0.730	Y
kris2001	201	0.750	Y
kris4001	401	2.530	Y
kris6001	601	4.900	Y
kris8001	801	6.320	Y
kris10001	1001	10.430	Y
kris12001	1201	12.620	Y
kris14001	1401	13.810	Y
kris16001	1601	22.420	Y
kris18001	1801	21.420	Y
kris20001	2001	33.460	Y
kris25001	2501	45.260	Y
kris30001	3001	49.350	Y
kris35001	3501	68.280	Y
kris40001	4001	88.360	Y
kris45001	4501	107.190	Y
kris50001	5001	133.030	Y

Table 1: Tableaux'98 Concept Satisfiability Tests

	Incoherent			Coherent		
Test	**Size**	**Time (s)**	**Correct**	**Size**	**Time (s)**	**Correct**
k_branch	18	55.360	Y	12	55.080	Y
k_d4	21	0.120	Y	21	2.430	Y
k_dum	21	0.050	Y	21	0.090	Y
k_grz	21	0.080	Y	21	0.170	Y
k_lin	21	0.050	Y	21	5.500	Y
k_path	21	1.290	Y	21	1.390	Y
k_ph	7	96.250	Y	13	84.860	Y
k_poly	21	0.380	Y	21	0.650	Y
k_t4p	21	0.140	Y	21	0.340	Y

Table 2: Tableaux'98 TBox Tests

	Incoherent			Coherent		
Test	**Size**	**Concepts**	**Correct**	**Size**	**Concepts**	**Correct**
k_branch	5	601	Y	5	602	Y
k_d4	17	1350	Y	12	1102	Y
k_dum	21	585	Y	21	650	Y
k_grz	21	1330	Y	21	1349	Y
k_lin	21	934	Y	9	939	Y
k_path	11	1293	Y	10	1291	Y
k_ph	6	324	Y	6	319	Y
k_poly	8	571	Y	8	587	Y
k_t4p	21	637	Y	21	1192	Y

Table 4: Synthetic Tbox Classification Tests

Test	**Concepts**	**Time (s)**	**Correct**
hc14	10	0.040	Y
hc18	18	0.170	Y
hc112	26	0.370	Y
hc24	46	0.380	Y
hc28	94	2.010	Y
hc212	142	5.210	Y
hc34	18	0.210	Y
hc36	26	0.480	Y
hc38	34	0.920	Y
hc44	7	0.030	Y
hc48	7	0.070	Y
hc412	7	0.100	Y

Table 5: Realistic Tbox Classification Tests

Knowledge Base	**Concepts**	**Time (s)**	**Correct**
ckb-roles	79	0.270	Y
datamont-roles	120	0.360	Y
espr-roles	142	0.130	Y
fss-roles	132	0.640	Y
wines	267	2.050	Y
wisber-roles	140	0.780	Y
galen1	2728	284.070	Y
galen2	3926	65.850	Y