

OpenRuleBench: Report 2011*

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1 Introduction

This report documents the 2011 re-test of the OpenRuleBench benchmarking suite [1, 2] for four of the leading rule-based engines: Ontobroker, XSB, YAP and dlV. The versions tested in 2009, were: OntoBroker 5.3, XSB 3.1, yap-5.1.3 and dlV-Oct-11-2008, while in 2010 we tested OntoBroker 6.0, XSB 3.2 (checked out from the CVS repository in January 2010), and yap-6.0.4 (checked out from the git repository in January 2010) (no newer version was available for dlV when the tests were repeated). This year (2011) we tested OntoBroker 6.1, XSB 3.3 Pignoletto (checked out from the CVS repository in February 2011), yap-6.2.0 (checked out from the git repository in February 2011), dlV-Oct-14-2010 and dlV-Oct-14-2010 with Magic Set transformation for some bound queries.

2 Results

For each of the tests included in OpenRuleBench [2], we present the results of the 2009 and 2010 tests and the latest results, which use the latest versions

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of the systems. In the following tables, *size* means the total size of all base relations; *error* means that the system gave an error during the evaluation; *timeout* indicates that evaluation did not finish within a set time limit of 30 minutes. The times are given in seconds; they represent the total elapsed time from the start of each test till its completion *excluding* the loading time¹.

2.1 Large Join Tests

The execution times are shown in Tables 2, 3 and 4 (Join1), Table 5 (5*Join1), Table 6 (Join2), Table 7 (Mondial), and Table 8 (DBLP).

data files	domain size	base relation size
data0	1000	10000
data1	1000	50000
data2	1000	250000

Table 1: Join1 and 5*Join1 test datafiles

system	a			b1			b2		
	data0	data1	data2	data0	data1	data2	data0	data1	data2
OB 5.3	4.089	28.385	155.510	0.213	4.806	38.332	0.019	0.168	3.479
OB 6.0 (2010)	1.861	11.768	143.285	0.066	4.890	33.645	0.059	0.089	4.424
OB 6.1 (2011)	2.173	8.807	59.259	0.145	2.029	9.797	0.013	0.064	0.765
XSB 3.1	15.906	timeout	timeout	0.310	20.699	timeout	0.034	0.860	15.772
XSB 3.2 (2010)	16.178	timeout	timeout	0.324	18.428	timeout	0.033	0.832	15.588
XSB 3.3 (2011)	16.093	timeout	timeout	0.296	18.137	timeout	0.028	0.776	15.617
yap-5.1.3	10.534	timeout	timeout	0.109	12.123	timeout	0.013	0.269	8.325
yap-6.0.4 (2010)	14.246	timeout	timeout	0.145	16.226	timeout	0.017	0.339	8.945
yap-6.2.0 (2011)	13.932	timeout	timeout	0.148	16.345	timeout	0.020	0.336	8.529
dlv-Oct-11-2008	85.698	850.719	1160.265	7.235	60.873	290.874	0.677	9.260	69.704
dlv-Oct-14-2010	79.838	827.470	1153.411	6.114	57.631	267.979	0.586	7.567	67.980

Table 2: Join1, no query bindings

2.2 Datalog Recursion

The results for the transitive closure query `tc` are described in Tables 9, 10 and 11, and the same generation query `sgin` Tables 13, 14 and 15 with

¹ *dlv* combines loading and much of the inference in one step, so we run tests with and without querying to estimate the time of loading alone.

system	a			b1			b2		
	data0	data1	data2	data0	data1	data2	data0	data1	data2
OB 5.3	0.035	0.038	0.175	0.013	0.051	0.149	0.070	0.012	0.034
OB 6.0 (2010)	0.003	0.014	0.142	0.001	0.006	0.048	0.021	0.001	0.022
OB 6.1 (2011)	0.008	0.007	0.021	0.002	0.004	0.004	0.007	0.016	0.020
XSB 3.1	0.015	40.156	timeout	0.001	0.018	3.073	0.000	0.000	0.012
XSB 3.2 (2010)	0.014	34.282	timeout	0.000	0.015	2.822	0.000	0.001	0.012
XSB 3.3 (2011)	0.012	35.958	timeout	0.000	0.016	2.848	0.000	0.000	0.012
yap-5.1.3	0.021	30.233	timeout	0.007	0.050	2.310	0.004	0.025	0.189
yap-6.0.4 (2010)	0.027	41.178	timeout	0.009	0.063	2.370	0.006	0.031	0.195
yap-6.2.0 (2011)	0.028	42.150	timeout	0.007	0.060	2.368	0.000	0.028	0.180
dlv-Oct-11-2008	0.275	5.916	68.643	0.014	0.140	0.776	0.006	0.062	0.496
dlv-Oct-14-2010	76.250	808.900	1133.036	3.801	53.498	263.844	0.297	4.422	64.368
dlv-Oct-14-2010-MS ²	0.256	5.456	67.744	0.012	0.095	0.587	0.006	0.056	0.492

Table 3: Join1 with 1st argument bound

system	a			b1			b2		
	data0	data1	data2	data0	data1	data2	data0	data1	data2
OB 5.3	0.030	0.036	0.229	0.011	0.010	0.045	0.028	0.009	0.030
OB 6.0 (2010)	0.003	0.013	0.141	0.001	0.006	0.042	0.001	0.001	0.011
OB 6.1 (2011)	0.004	0.008	0.005	0.002	0.003	0.003	0.013	0.016	0.006
XSB 3.1	4.997	timeout	timeout	0.049	4.754	1586.839	0.005	0.092	6.404
XSB 3.2 (2010)	5.057	timeout	timeout	0.060	3.813	1474.175	0.005	0.077	5.983
XSB 3.3 (2011)	5.135	timeout	timeout	0.053	3.799	1494.439	0.005	0.077	5.993
yap-5.1.3	0.814	539.710	timeout	0.014	0.246	8.557	0.004	0.025	0.165
yap-6.0.4 (2010)	0.897	581.983	timeout	0.016	0.276	8.662	0.005	0.029	0.177
yap-6.2.0 (2011)	0.932	670.899	timeout	0.016	0.275	7.395	0.005	0.029	0.171
dlv-Oct-11-2008	0.540	59.642	288.908	0.021	0.328	15.943	0.006	0.063	0.504
dlv-Oct-14-2010	76.303	810.815	1145.640	3.910	53.501	267.764	0.302	4.400	64.098
dlv-Oct-14-2010-MS	0.587	55.323	283.264	0.020	0.315	16.384	0.006	0.061	0.515

Table 4: Join1 with 2nd argument bound

different variable bindings: free-free, bound-free and free-bound.

system	a			b1			b2		
	data0	data1	data2	data0	data1	data2	data0	data1	data2
OB 5.3	3.647	28.497	156.138	0.163	4.601	38.556	0.029	0.189	3.533
OB 6.0 (2010)	3.367	14.915	81.242	0.607	5.586	28.156	0.114	1.154	6.186
OB 6.1 (2011)	2.166	9.024	58.250	0.131	2.008	9.666	0.017	0.060	0.775
XSB 3.1	61.879	timeout	timeout	0.601	71.419	timeout	0.061	1.392	54.956
XSB 3.2 (2010)	62.498	timeout	timeout	0.633	66.065	timeout	0.063	1.285	53.055
XSB 3.3 (2011)	61.584	timeout	timeout	0.617	63.103	timeout	0.065	1.266	51.536
yap-5.1.3	52.202	timeout	timeout	0.522	61.650	timeout	0.054	1.246	39.287
yap-6.0.4 (2010)	70.587	timeout	timeout	0.698	80.089	timeout	0.072	1.601	42.082
yap-6.2.0 (2011)	69.745	timeout	timeout	0.700	81.489	timeout	0.072	1.693	44.690
dlv-Oct-11-2008	418.555	timeout	timeout	28.313	292.042	1443.781	2.471	35.380	339.457
dlv-Oct-14-2010	405.478	timeout	timeout	29.654	296.350	1365.537	2.316	32.377	342.352

Table 5: 5*Join1, no query binding

system	OB5.3	OB6.0	OB6.1	XSB 3.1	XSB3.2	XSB3.3	yap-5.1.3	yap-6.0.4	yap-6.2.0	dlv'08	dlv'10
time	11.935	0.017	0.017	2.021	1.860	2.057	2.087	2.649	2.496	49.540	45.016

Table 6: Times for Join2

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	6.129	19.145	29.172	95.970	49.722	182.633	156.202	443.891	277.840	911.730
OB 6.0 (2010)	2.534	5.897	13.285	31.207	25.689	77.370	74.864	145.708	154.427	310.682
OB 6.1 (2011)	1.805	4.609	9.633	25.971	19.963	61.648	40.627	88.262	87.353	200.948
XSB 3.1	2.725	7.081	15.322	38.205	35.036	88.028	61.042	148.582	136.213	323.492
XSB 3.2 (2010)	2.798	7.694	15.541	40.972	35.082	93.129	64.491	162.079	141.451	347.142
XSB 3.3 (2011)	2.860	7.860	15.964	43.600	35.829	95.855	66.195	167.378	144.401	356.170
yap-5.1.3	2.066	13.026	13.690	48.934	33.128	82.900	48.979	269.419	128.128	428.680
yap-6.0.4 (2010)	2.623	13.392	17.025	55.169	39.505	96.987	62.874	253.773	150.123	465.184
yap-6.2.0 (2011)	2.450	13.215	15.790	50.583	36.637	88.993	58.700	249.394	135.745	430.425
dlv-Oct-11-2008	21.673	74.512	89.084	331.483	128.215	880.706	380.292	1521.722	651.966	timeout
dlv-Oct-14-2010	21.871	74.388	86.304	328.377	136.163	697.532	380.253	1470.110	849.371	timeout

Table 9: Transitive closure, no query bindings

system	OB5.3	OB6.0	OB6.1	XSB 3.1	XSB3.2	XSB3.3	yap-5.1.3	yap-6.0.4	yap-6.2.0	dlv'08	dlv'10
time	0.042	0.032	0.021	0.004	0.004	0.004	0.037	0.035	0.039	0.890	0.841

Table 7: Times for Mondial

system	OB5.3	OB6.0	OB6.1	XSB 3.1	XSB3.2	XSB3.3	yap-5.1.3	yap-6.0.4	yap-6.2.0	dlv'08	dlv'10
time	1.602	0.031	0.039	1.752	1.708	1.746	2.447	2.818	2.706	2.041	1.830

Table 8: Times for DBLP

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	5.708	21.787	25.145	108.835	47.804	180.758	224.979	510.653	361.114	899.843
OB 6.0 (2010)	1.832	5.822	8.114	28.216	17.469	53.949	39.104	136.208	66.142	340.705
OB 6.1 (2011)	1.695	4.563	10.077	24.854	19.997	62.562	39.328	92.817	86.545	197.173
XSB 3.1	1.437	5.563	8.922	27.921	18.532	55.447	35.473	112.490	73.373	226.064
XSB 3.2 (2010)	1.433	5.241	8.160	25.997	16.826	52.079	32.502	105.014	67.881	210.744
XSB 3.3 (2011)	1.401	5.327	8.158	26.437	16.877	52.821	32.635	108.026	67.615	215.148
yap-5.1.3	0.722	5.666	4.327	19.675	9.026	31.454	16.945	106.590	35.259	169.589
yap-6.0.4 (2010)	0.913	4.933	5.655	17.839	12.009	30.331	22.535	87.380	47.898	150.156
yap-6.2.0 (2011)	0.850	5.191	5.210	18.537	10.891	32.282	20.947	91.589	43.345	154.511
dlv-Oct-11-2008	17.230	64.031	74.162	285.374	109.321	507.360	362.113	1282.090	638.588	timeout
dlv-Oct-14-2010	19.498	69.900	84.713	324.874	135.033	699.855	376.696	1459.399	827.966	timeout
dlv-Oct-14-2010-MS	16.569	62.742	76.46	288.951	111.539	512.644	387.688	1342.494	670.780	timeout

Table 10: Transitive closure, 1st argument bound.

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	0.015	0.054	0.033	0.148	0.042	0.271	0.016	0.255	0.017	0.566
OB 6.0 (2010)	0.033	0.054	0.021	0.081	0.016	0.138	0.018	0.132	0.021	0.263
OB 6.1 (2011)	0.020	0.009	0.009	0.009	0.010	0.009	0.011	0.009	0.025	0.016
XSB 3.1	0.016	0.015	0.088	0.079	0.180	0.157	0.186	0.167	0.371	0.332
XSB 3.2 (2010)	0.014	0.014	0.090	0.079	0.183	0.153	0.186	0.168	0.374	0.328
XSB 3.3 (2011)	0.014	0.013	0.086	0.078	0.176	0.153	0.178	0.170	0.357	0.333
yap-5.1.3	0.036	0.048	0.243	0.300	0.575	0.689	0.572	0.692	1.270	1.800
yap-6.0.4 (2010)	0.044	0.046	0.251	0.252	0.624	0.593	0.622	0.645	1.417	1.421
yap-6.2.0 (2011)	0.044	0.046	0.252	0.248	0.623	0.581	0.615	0.632	1.395	1.395
dlv-Oct-11-2008	0.020	0.062	0.165	0.414	0.293	0.840	0.394	0.902	0.729	1.837
dlv-Oct-14-2010	19.988	70.001	84.782	322.497	135.325	702.596	368.125	1456.418	821.949	timeout
dlv-Oct-14-2010-MS	0.197	0.207	0.835	7.023	24.207	300.252	0.956	1.216	57.241	timeout

Table 11: Transitive closure, 2nd argument bound.

data files	domain size	par/2 size	cycles in data
data0	1000	50000	no
data1	1000	50000	yes
data2	1000	250000	no
data3	1000	250000	yes
data4	1000	500000	no
data5	1000	500000	yes
data6	2000	500000	no
data7	2000	500000	yes
data8	2000	1000000	no
data9	2000	1000000	yes

Table 12: Transitive closure test datafiles

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	1.499	1.923	2.691	3.274	5.234	5.548	2.863	6.943	7.224	10.150
OB 6.0 (2010)	0.863	1.111	1.592	1.401	3.641	3.142	1.653	4.257	4.539	5.597
OB 6.1 (2011)	0.643	0.891	1.606	1.808	2.685	2.461	0.787	2.595	2.701	3.654
XSB 3.1	2.359	3.408	10.197	11.905	42.824	44.487	1.410	4.671	9.673	14.342
XSB 3.2 (2010)	2.725	3.753	11.522	13.326	48.593	49.756	1.320	5.109	9.465	15.656
XSB 3.3 (2011)	2.781	3.853	11.856	13.733	49.532	51.553	1.291	5.219	9.768	16.618
yap-5.1.3	1.875	3.148	8.929	11.339	43.510	43.452	0.858	4.042	7.292	13.224
yap-6.0.4 (2010)	2.057	3.400	10.201	12.087	44.286	45.742	1.018	4.389	8.467	14.270
yap-6.2.0 (2011)	2.066	3.532	10.982	12.643	45.788	47.852	1.026	4.637	8.498	14.866
dlv-Oct-11-2008	19.901	31.419	86.164	109.201	396.417	435.069	11.074	45.673	73.487	141.776
dlv-Oct-14-2010	20.898	31.753	80.541	111.117	352.650	432.637	12.624	46.016	68.387	142.343

Table 13: Same generation, no query bindings.

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	0.918	1.720	1.707	2.772	4.122	5.166	0.481	7.197	4.075	10.094
OB 6.0 (2010)	0.738	1.619	1.917	2.170	3.300	3.415	0.235	5.502	4.323	6.392
OB 6.1 (2011)	0.632	0.659	1.164	0.945	1.991	1.786	1.094	2.984	3.203	3.867
XSB 3.1	1.338	3.245	7.954	11.305	35.823	42.297	0.045	4.329	5.514	13.727
XSB 3.2 (2010)	0.977	3.051	8.038	10.658	35.753	39.540	0.081	4.261	4.905	12.799
XSB 3.3 (2011)	0.804	3.129	8.264	11.015	33.641	41.127	0.118	4.219	3.788	13.493
yap-5.1.3	0.619	1.398	3.120	4.993	18.238	18.866	0.066	1.791	1.186	5.916
yap-6.0.4 (2010)	0.552	1.449	3.732	5.190	18.561	19.527	0.016	1.878	2.140	6.169
yap-6.2.0 (2011)	0.492	1.553	4.046	5.566	18.874	20.911	0.056	1.988	2.130	6.596
dlv-Oct-11-2008	12.322	30.044	57.496	106.105	328.246	420.572	2.309	39.475	33.636	131.668
dlv-Oct-14-2010	20.090	30.839	80.119	109.613	354.673	436.003	10.330	41.474	64.763	137.914
dlv-Oct-14-2010-MS	8.737	30.288	62.453	107.713	331.364	419.324	0.372	39.947	33.215	137.914

Table 14: Same generation, 1st argument bound.

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9
OB 5.3	0.947	1.748	1.958	2.920	4.562	5.380	0.449	6.934	4.440	10.167
OB 6.0 (2010)	0.888	1.604	1.870	2.097	4.078	4.150	0.242	5.649	4.163	7.479
OB 6.1 (2011)	0.636	0.688	1.225	1.044	2.000	1.814	1.121	2.785	3.262	3.894
XSB 3.1	2.859	3.954	13.307	14.488	55.855	51.406	1.690	5.673	12.828	18.478
XSB 3.2 (2010)	3.101	3.911	13.171	13.695	53.257	49.956	1.404	5.589	10.860	17.165
XSB 3.3 (2011)	3.243	4.198	13.843	14.471	57.135	52.651	1.510	6.580	11.221	17.832
yap-5.1.3	0.845	1.539	3.779	5.253	19.178	19.450	0.380	2.125	3.309	6.550
yap-6.0.4 (2010)	0.918	1.640	4.611	5.598	19.445	20.425	0.475	2.354	3.878	7.057
yap-6.2.0 (2011)	0.917	1.720	4.917	6.400	20.056	21.627	0.459	2.391	3.881	7.385
dlv-Oct-11-2008	14.987	39.339	71.902	125.865	402.087	502.053	3.108	84.025	53.535	280.852
dlv-Oct-14-2010	20.099	30.932	79.576	110.632	356.365	430.116	10.338	41.403	64.989	error
dlv-Oct-14-2010-MS	10.142	36.478	73.712	125.595	394.939	486.568	0.421	66.880	43.836	217.389

Table 15: Same generation, 2nd argument bound.

data files	domain size	par/2 size	sib/2 size	cycles in data
data0	500	5000	1000	no
data1	500	5000	1000	yes
data2	500	10000	2000	no
data3	500	10000	2000	yes
data4	500	20000	4000	no
data5	500	20000	4000	yes
data6	1000	5000	1000	no
data7	1000	5000	1000	yes
data8	1000	10000	2000	no
data9	1000	10000	2000	yes

Table 16: Same Generation test datafiles

The results for the Wordnet tests are in the Tables 2.2, 2.2, 2.2, 2.2, 2.2 and 2.2.

system	allSameSynset	allGlosses	allDirectHypernyms	allHypernyms	allDirectHyponyms
OB 5.3	0.283	0.198	0.543	6.888	0.605
OB 6.0 (2010)	0.022	0.001	0.031	0.285	0.001
OB 6.1 (2011)	0.066	0.049	0.014	0.066	0.016
XSB 3.1	0.220	0.160	0.380	1.524	0.376
XSB 3.2 (2010)	0.224	0.140	0.280	1.236	0.320
XSB 3.3 (2011)	0.220	0.144	0.280	1.260	0.316
yap-5.1.3	0.496	0.224	0.156	0.244	0.168
yap-6.0.4 (2010)	0.376	0.184	0.380	0.768	0.380
yap-6.2.0 (2011)	0.360	0.188	0.368	0.772	0.408
dlv-Oct-11-2008	5.610	3.150	4.670	33.650	4.670
dlv-Oct-14-2010	4.430	2.280	3.440	27.140	3.500

Table 17: Computing Time for WordNet tests 1

system	allSameSynset	allGlosses	allDirectHypernyms	allHypernyms	allDirectHyponyms
OB 5.3	19.222	28.637	23.926	24.163	24.06
OB 6.0 (2010)	13.893	23.168	19.187	19.813	19.376
OB 6.1 (2011)	13.987	13.566	16.402	16.587	16.630
XSB 3.1	0.808	1.460	1.040	1.037	1.041
XSB 3.2 (2010)	0.708	1.245	0.921	0.921	0.913
XSB 3.3 (2011)	0.724	1.253	0.916	0.909	0.908
yap-5.1.3	1.440	2.460	1.912	2.020	2.060
yap-6.0.4 (2010)	1.524	2.512	2.036	2.04	2.048
yap-6.2.0 (2011)	1.936	3.400	2.624	2.660	2.616
dlv-Oct-11-2008	1.430	2.450	1.910	1.830	1.950
dlv-Oct-14-2010	1.660	2.780	2.150	2.180	2.160

Table 18: Loading Time for WordNet tests 1

system	allHyponyms	allDirectMeronyms	allMeronyms	allDirectHolonyms	allHolonyms
OB 5.3	6.611	0.086	1.074	0.923	0.964
OB 6.0 (2010)	0.276	0.001	0.026	0.008	0.013
OB 6.1 (2011)	0.029	0.010	0.033	0.013	0.029
XSB 3.1	1.868	0.144	0.688	0.124	0.612
XSB 3.2 (2010)	1.592	0.124	0.468	0.116	0.388
XSB 3.3 (2011)	1.588	0.120	0.544	0.120	0.472
yap-5.1.3	0.236	0.148	0.216	0.164	0.224
yap-6.0.4 (2010)	0.980	0.348	0.476	0.336	0.448
yap-6.2.0 (2011)	0.976	0.328	0.416	0.324	0.408
dlv-Oct-11-2008	35.920	1.860	7.460	1.460	7.200
dlv-Oct-14-2010	29.190	1.180	5.850	1.220	5.570

Table 19: Computing Time for WordNet tests 2

system	allHyponyms	allDirectMeronyms	allMeronyms	allDirectHolonyms	allHolonyms
OB 5.3	24.166	20.319	19.914	20.231	19.942
OB 6.0 (2010)	19.615	16.148	16.229	16.188	16.143
OB 6.1 (2011)	14.076	14.007	14.319	14.045	14.076
XSB 3.1	1.0130	0.853	0.832	0.841	0.833
XSB 3.2 (2010)	0.921	0.733	0.733	0.729	0.729
XSB 3.3 (2011)	0.892	0.728	0.744	0.745	0.741
yap-5.1.3	2.072	1.516	1.548	1.540	1.604
yap-6.0.4 (2010)	2.028	1.608	1.592	1.620	1.600
yap-6.2.0 (2011)	2.620	2.044	2.024	2.032	2.052
dlv-Oct-11-2008	1.980	1.580	1.650	1.690	1.680
dlv-Oct-14-2010	2.150	1.840	1.830	1.810	1.840

Table 20: Loading Time for WordNet tests 2

system	OB5.3	OB6.0	OB6.1	XSB 3.1	XSB3.2	XSB3.3	yap-5.1.3	yap-6.0.4	yap-6.2.0	dlv'08	dlv'10
time	5.23	4.536	3.210	4.470	4.933	4.823	12.05	5.531	5.571	21.067	20.953

Table 23: The Wine ontology test.

system	allDirectTroponyms	allTroponyms	allDirectAdjectiveClusters	allAdjectiveClusters	allAntonyms
OB 5.3	0.031	0.042	0.267	1.230	0.206
OB 6.0 (2010)	0.001	0.001	0.001	0.175	0.001
OB 6.1 (2011)	0.016	0.014	0.010	0.072	0.015
XSB 3.1	0.068	0.340	0.168	0.744	0.1240
XSB 3.2 (2010)	0.060	0.204	0.132	0.564	0.096
XSB 3.3 (2011)	0.056	0.288	0.140	0.656	0.096
yap-5.1.3	0.152	0.216	0.128	0.176	0.356
yap-6.0.4 (2010)	0.336	0.372	0.312	0.444	0.212
yap-6.2.0 (2011)	0.296	0.352	0.308	0.456	0.292
dlv-Oct-11-2008	1.180	1.390	1.750	10.350	1.410
dlv-Oct-14-2010	0.790	0.810	1.090	8.280	0.770

Table 21: Computing Time for WordNet tests 3

system	allDirectTroponyms	allTroponyms	allDirectAdjectiveClusters	allAdjectiveClusters	allAntonyms
OB 5.3	19.280	20.103	21.005	21.875	20.266
OB 6.0 (2010)	14.058	14.215	16.333	16.485	16.041
OB 6.1 (2011)	13.859	14.112	14.287	14.323	13.674
XSB 3.1	0.804	0.817	0.888	0.881	0.813
XSB 3.2 (2010)	0.701	0.713	0.756	0.753	0.713
XSB 3.3 (2011)	0.696	0.724	0.761	0.768	0.705
yap-5.1.3	1.516	1.500	1.604	1.664	1.564
yap-6.0.4 (2010)	1.532	1.5	1.672	1.688	1.576
yap-6.2.0 (2011)	1.952	1.94	2.108	2.104	2.028
dlv-Oct-11-2008	1.520	1.470	1.880	1.620	1.480
dlv-Oct-14-2010	1.700	1.700	1.900	1.840	1.850

Table 22: Loading Time for WordNet tests 3

The results for Wine ontology tests are in the Table 23.

2.3 Default Negation

The results for stratified tests are in the Table 24.

system	win-non-win					same generation				
	data0	data1	data2	data3	data4	data0	data1	data2	data3	data4
OB 5.3	1.327	3.175	9.988	17.482	timeout	14.883	24.963	timeout	51.957	timeout
OB 6.0 (2010)	0.332	0.766	2.177	4.503	10.435	3.069	5.313	9.212	10.603	13.995
OB 6.1 (2011)	0.284	0.592	1.715	3.669	7.926	1.302	2.766	3.586	4.334	6.332
XSB 3.1	0.231	0.470	1.218	2.475	5.081	7.265	24.215	90.928	10.947	30.052
XSB 3.2 (2010)	0.231	0.470	1.218	2.475	5.081	4.139	13.683	49.835	7.077	17.390
XSB 3.3 (2011)	0.167	0.348	0.907	1.872	3.816	4.1880	13.951	52.644	6.6980	17.735
yap-5.1.3	0.103	0.239	0.654	1.401	2.866	3.339	11.673	44.605	4.689	13.866
yap-6.0.4 (2010)	0.112	0.255	0.732	1.594	3.269	3.551	12.379	46.455	4.983	14.985
yap-6.2.0 (2011)	0.111	0.260	0.737	1.589	3.271	3.695	12.902	48.226	5.139	15.556
dlv-Oct-11-2008	0.674	1.406	3.558	7.232	14.917	37.116	118.545	447.397	62.552	165.182
dlv-Oct-14-2010	0.650	1.258	3.193	6.706	13.465	41.964	133.878	453.312	67.346	171.535

Table 24: Locally- and predicate-stratified negation.

data files	upper bound
data0	50000
data1	100000
data2	250000
data3	500000
data4	1000000

Table 25: Win-non-win test datafiles

The results for stratified tests are in Table 26.

system	win-non-win					magic set				
	data0	data1	data2	data3	data4	data0	data1	data2	data3	data4
OB 5.3	0.419	1.224	3.754	8.226	17.237	0.236	1.426	8.409	3.236	21.502
OB 6.0 (2010)	0.025	0.060	0.129	0.251	0.506	0.079	0.248	1.404	0.490	3.716
OB 6.1 (2011)	0.032	0.045	0.108	0.202	0.316	0.049	0.172	0.678	0.177	0.858
XSB 3.1	0.339	0.698	1.416	2.857	5.647	1.381	1.476	1.663	error	error
XSB 3.2 (2010)	0.548	1.132	0.928	1.924	3.861	1.528	1.660	1.864	error	error
XSB 3.3 (2011)	0.646	1.316	1.025	2.055	4.108	1.694	1.778	1.960	error	error
dlv-Oct-11-2008	0.348	0.753	1.892	3.995	8.223	0.084	0.386	2.041	0.963	5.009
dlv-Oct-14-2010	0.328	0.695	1.731	3.608	7.473	0.088	0.402	2.287	1.001	5.173

Table 26: Times for rule sets that are not locally stratified.

data files	domain size	h/2 and b/2 relation size
data0	1000	10000
data1	1000	50000
data2	1000	250000
data3	5000	100000
data4	5000	500000

Table 27: Magic Sets transformation test datafiles

2.4 Tests Involving Function Symbols

The results for the tests involving function symbols are in the Tables 28, 29 and 30.

system	14	16	18	20	22
XSB 3.1	5.307	9.115	17.646	30.498	66.530
XSB 3.2 (2010)	4.825	8.197	16.043	28.005	65.891
XSB 3.3 (2011)	5.055	8.709	16.857	29.610	70.307
yap-5.1.3	0.769	1.428	2.602	4.513	9.816
yap-6.0.4 (2010)	0.754	1.383	2.519	4.192	9.511
yap-6.2.0 (2011)	0.716	1.368	2.475	4.239	9.458
dlv-Oct-11-2008	0.209	0.304	0.507	1.607	7.468
dlv-Oct-14-2010	0.214	0.320	0.535	1.632	7.406

Table 28: Times for 16 Puzzle

system	8	10	12	14	16
XSB 3.1	0.005	0.135	3.822	147.430	timeout
XSB 3.2 (2010)	0.005	0.113	3.460	135.358	timeout
XSB 3.3 (2011)	0.005	0.116	3.632	138.186	timeout
yap-5.1.3	0.002	0.054	1.507	58.152	timeout
yap-6.0.4 (2010)	0.002	0.049	1.489	57.915	timeout
yap-6.2.0 (2011)	0.004	0.054	1.668	62.666	timeout
dlv-Oct-11-2008	0.093	1.301	33.225	1120.251	timeout
dlv-Oct-14-2010	0.033	1.693	44.322	1477.200	timeout

Table 29: Times for N-Queens

system	16	17	18	19	20
XSB 3.1	6.812	14.903	33.949	75.328	error
XSB 3.2 (2010)	5.815	12.736	28.834	63.876	error
XSB 3.3 (2011)	5.864	12.829	29.173	64.693	error
yap-5.1.3	1.506	4.383	17.032	54.893	141.161
yap-6.0.4 (2010)	2.923	7.995	20.043	47.259	106.428
yap-6.2.0 (2011)	2.517	7.291	19.276	45.644	107.136

Table 30: Times for BitRev

2.5 Dynamic Indexing

For dynamic indexing (see Tables 31, 32, 33, and 34), XSB is much better than before.

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9	data10	data11	data12	data13	data14
OB 5.3	1.015	1.009	0.998	1.565	1.557	1.540	3.837	3.703	3.738	8.551	8.929	7.201	18.239	18.896	16.760
OB 6.0 (2010)	0.441	0.343	0.352	0.603	0.617	0.611	1.070	1.030	1.101	1.890	2.367	2.125	4.883	4.811	6.958
OB 6.1 (2011)	0.499	0.608	0.508	0.654	0.650	0.693	0.956	0.934	1.540	2.149	2.158	2.465	4.170	4.191	6.706
XSB 3.1	6.208	0.232	0.238	370.058	0.491	0.476	491.984	1.222	1.210	timeout	2.476	2.471	timeout	22.253	4.442
XSB 3.2 (2010)	5.931	0.227	0.230	32.791	0.453	0.459	393.127	1.148	1.131	1671.871	2.245	2.359	timeout	4.613	4.721
XSB 3.3 (2011)	5.919	0.236	0.243	34.629	0.479	0.451	392.615	1.192	1.188	1652.282	2.384	2.303	timeout	4.744	4.773
yap-5.1.3	0.044	0.045	0.044	0.064	0.059	0.062	0.162	0.172	0.164	0.308	0.353	0.324	0.733	0.708	0.786
yap-6.0.4 (2010)	0.795	1.432	1.486	0.144	0.141	0.138	0.426	0.420	0.415	0.776	0.772	0.770	0.064	0.060	0.066
yap-6.2.0 (2011)	0.088	0.080	0.080	0.192	0.172	0.180	0.412	0.408	0.440	0.696	0.732	0.752	1.560	1.572	1.572
dlv-Oct-11-2008	0.221	0.219	0.211	0.440	0.433	0.429	1.125	1.102	1.109	2.272	2.218	2.238	4.629	4.526	4.590
dlv-Oct-14-2010	0.178	0.168	0.170	0.356	0.346	0.350	0.915	0.918	0.912	1.876	1.861	1.839	3.843	3.852	3.799

Table 31: Times for insertion

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9	data10	data11	data12	data13	data14
OB 5.3	0.319	0.326	0.347	0.297	0.299	0.329	0.294	0.297	0.330	0.323	0.295	0.294	0.312	0.296	0.340
OB 6.0 (2010)	0.003	0.033	0.002	0.003	0.041	0.002	0.002	0.002	0.003	0.003	0.011	0.003	0.003	0.003	0.003
OB 6.1 (2011)	0.004	0.003	0.003	0.004	0.004	0.003	0.078	0.004	0.004	0.007	0.004	0.006	0.007	0.004	0.004
XSB 3.1	0.002	0.002	0.002	0.004	0.004	0.004	0.010	0.010	0.010	timeout	0.020	0.019	timeout	0.091	0.039
XSB 3.2 (2010)	0.002	0.003	0.003	0.005	0.005	0.005	0.012	0.012	0.011	0.024	0.024	0.024	timeout	0.049	0.048
XSB 3.3 (2011)	0.002	0.002	0.001	0.003	0.004	0.003	0.009	0.008	0.008	0.017	0.017	0.017	timeout	0.034	0.034
yap-5.1.3	0.007	0.006	0.007	0.017	0.016	0.016	0.040	0.039	0.039	0.082	0.083	0.082	0.160	0.156	0.155
yap-6.0.4 (2010)	0.008	0.010	0.017	0.018	0.018	0.058	0.096	0.096	0.096	0.157	0.157	0.156	0.358	0.022	0.358
yap-6.2.0 (2011)	0.018	0.018	0.018	0.016	0.017	0.017	0.097	0.097	0.097	0.192	0.189	0.192	0.223	0.228	0.231
dlv-Oct-11-2008	0.141	0.119	0.138	0.305	0.272	0.293	0.831	0.710	0.720	1.924	1.610	1.554	3.671	3.325	3.229
dlv-Oct-14-2010	0.150	0.142	0.140	0.329	0.295	0.298	0.901	0.762	0.787	1.879	1.642	1.671	3.908	3.430	3.510

Table 32: Times for querying

system	data0	data1	data2	data3	data4	data5	data6	data7	data8	data9	data10	data11	data12	data13	data14
OB 5.3	0.570	0.558	0.556	1.174	1.201	1.149	2.956	3.008	2.999	5.198	5.775	5.650	12.626	11.863	12.288
OB 6.0 (2010)	0.803	0.734	0.695	1.103	0.959	0.816	2.055	1.951	1.796	2.833	2.855	3.578	6.897	6.551	6.833
OB 6.1 (2011)	0.557	0.682	0.551	0.993	1.060	1.101	1.709	1.691	2.012	3.935	3.950	3.715	5.477	7.041	6.692
XSB 3.1	1641.781	0.196	0.195	timeout	0.388	0.390	timeout	0.977	0.971	timeout	2.160	2.167	timeout	15.418	15.218
XSB 3.2 (2010)	1563.325	0.174	0.175	timeout	0.348	0.348	timeout	0.880	0.872	timeout	1.927	1.934	timeout	4.146	4.187
XSB 3.3 (2011)	1457.466	0.182	0.185	timeout	0.360	0.360	timeout	0.912	0.914	timeout	2.011	2.007	timeout	4.285	4.284
yap-5.1.3	0.029	0.024	0.024	0.069	0.057	0.057	0.162	0.132	0.132	0.442	0.360	0.363	0.944	0.782	0.784
yap-6.0.4 (2010)	1.200	0.990	0.975	0.075	0.057	0.055	0.210	0.181	0.163	0.597	0.479	0.504	0.037	0.029	0.032
yap-6.2.0 (2011)	0.050	0.039	0.040	0.127	0.103	0.101	0.272	0.208	0.207	0.598	0.476	0.473	1.408	1.166	1.152

Table 33: Times for deletion

data files	upper bound	pattern
data0	50000	(1,i)
data1	50000	(i,1)
data2	50000	(i,i)
data3	100000	(1,i)
data4	100000	(i,1)
data5	100000	(i,i)
data6	250000	(1,i)
data7	250000	(i,1)
data8	250000	(i,i)
data9	500000	(1,i)
data10	500000	(i,1)
data11	500000	(i,i)
data12	1000000	(1,i)
data13	1000000	(i,1)
data14	1000000	(i,i)

Table 34: Data files for testing dynamic indexing

3 Conclusions

This report presents a re-run of the OpenRuleBench tests for newly released versions of top four systems of the benchmark. Overall, the new 2011 results show that OntoBroker has significantly improved its performance, while the performance of XSB improved with a small increment for many tests. The performance of Yap remained the same since 2010. DLV showed a decrease in speed for bound queries and large searches due to changes in its optimization techniques.

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