

The First Answer Set Programming System Competition

Martin Gebser Lengning Liu Gayathri Namasivayam André Neumann
Torsten Schaub Mirosław Truszczyński

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- Prelude
- Setting
- Benchmarks
- ASP Systems
- Results
- Lessons

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- Goals
 1. collect challenging benchmark problems
 2. assess a broad variety of ASP systems

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- ASP System = Grounder + Solver
- The ASP Competition was run prior to the LPNMR'07 on the Asparagus platform
 - 👉 <http://asparagus.cs.uni-potsdam.de/contest>

Agenda

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The Competition

was run in three different categories:

- **MGS:** Modeling, Grounding, Solving
- **SCore:** Solver, Core language
- **SLparse:** Solver, Lparse language

The Competition Category MGS

Modeling, Grounding, Solving

- Benchmarks consist of
 1. a problem statement,
 2. a set of instances (specified in terms of ground facts), and
 3. the names of the predicates and their arguments to be used by programmers to encode solutions
- The *overall performance* of an ASP system (including both the grounding of input programs and the solving of their ground instantiations) is measured
- Success depends on
 1. the problem encoding,
 2. the efficiency of a grounder, and
 3. the speed of a solver

The Competition Category SCore

Solver, Core language

- Benchmarks are ground programs in the format common to *dlv* and *lparse*
 - ➔ Aggregates are not allowed
- Instances are classified further into two subgroups:
 - *normal* (SCore) and
 - *disjunctive* (SCore^V)
- The time needed by *solvers* to compute answer sets of ground programs is measured

The Competition Category SLparse

Solver, Lparse language

- Benchmarks are ground programs in the Lparse format, *including aggregates*
- The performance of *solvers* on ground programs in Lparse format is measured

Assessing ASP Systems

- UNSAT: No Answer Set

Assessing ASP Systems

Output format

- **SAT:** Answer Set: $\langle atom_1 \rangle \langle atom_1 \rangle \dots \langle atom_n \rangle$
 - ↳ Certificates allowed for checking the *correctness* of a solution
- **UNSAT:** No Answer Set

Assessing ASP Systems

Output format

- **SAT:** *Answer Set:* $\langle atom_1 \rangle \langle atom_1 \rangle \dots \langle atom_n \rangle$
 - ↳ Certificates allowed for checking the *correctness* of a solution
- **UNSAT:** *No Answer Set*

Performance

- The number of instances solved within the allocated time and space was used as the *primary measure* of the performance of an ASP system
- Average running time is only used as a tie breaker

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Benchmarks submitted by the ASP community I

Benchmark Class	#Instances	Contributors	M	C	L
15-Puzzle	15	Lengning Liu and Mirosław Truszczyński	×	–	×
15-Puzzle	11	Asparagus	–	×	–
Blocked N-Queens	40	Gayathri Namasivayam and Mirosław Truszczyński	×	–	×
Blocked N-Queens	400	Asparagus	–	×	–
Bounded Spanning Tree	30	Gayathri Namasivayam and Mirosław Truszczyński	×	–	×
Car Sequencing	54	Marco Cadoli	×	–	×
Disjunctive Loops	9	Marco Maratea	–	×	–
EqTest	10	Asparagus	–	×	–
Factoring	10	Asparagus	–	×	×
Fast Food	221	Wolfgang Faber	×	–	×
Gebser Suite	202	Martin Gebser	–	×	×
Grammar-Based Information Extraction	102	Marco Manna	–	×	–
Hamiltonian Cycle	30	Lengning Liu and Mirosław Truszczyński	×	–	×
Hamiltonian Path	58	Asparagus	–	×	×
Hashiwokakero	211	Martin Brain	–	–	×
Hitori	211	Martin Brain	–	–	×
Knight's Tour	165	Martin Brain	–	–	×
Mutex	7	Marco Maratea	–	×	–
Random Non-Tight	120	Enno Schultz and Martin Gebser	–	×	×

Benchmarks submitted by the ASP community II

Benchmark Class	#Instances	Contributors	M	C	L
Random Quantified Boolean Formulas	40	Marco Maratea	–	×	–
Reachability	53	Giorgio Terracina	×	×	×
RLP	573	Yuting Zhao and Fangzhen Lin	–	×	×
Schur Numbers	33	Lengning Liu and Mirosław Truszczyński	×	–	×
Schur Numbers	5	Asparagus	–	×	–
Social Golfer	175	Marco Cadoli	×	–	×
Sokoban	131	Wolfgang Faber	×	–	–
Solitaire Backward	36	Martin Brain	–	–	×
Solitaire Backward (2)	10	Lengning Liu and Mirosław Truszczyński	–	–	×
Solitaire Forward	41	Martin Brain	–	–	×
Strategic Companies	35	Nicola Leone	–	×	–
Su-Doku	8	Martin Brain	–	–	×
TOAST	54	Martin Brain	–	–	×
Towers of Hanoi	29	Gayathri Namasivayam and Mirosław Truszczyński	×	–	×
Traveling Salesperson	30	Lengning Liu and Mirosław Truszczyński	×	–	×
Weight-Bounded Dominating Set	30	Lengning Liu and Mirosław Truszczyński	×	–	×
Weighted Latin Square	35	Gayathri Namasivayam and Mirosław Truszczyński	×	–	×
Weighted Spanning Tree	30	Gayathri Namasivayam and Mirosław Truszczyński	×	–	×
Word Design DNA	5	Marco Cadoli	×	–	×

Benchmark (Instance) Selection

- Aimed at a total of $|Classes| * max \approx 100$ benchmark instances per competition category (if feasible)
- A benchmark instance had to satisfy the following criteria:
 1. at least one call script was able to solve it and
 2. at most three call scripts solved it in less than one second

☞ In other words: *Some system can solve it, yet it is not too easy!*
- The selection of candidates for benchmark instances was done randomly

Algorithm 1: Semiautomatic Benchmarking Procedure

Input: *Classes* — set of benchmark classes

Used — set of benchmark instances run already

Fresh — set of benchmark instances not run so far

max — maximum number of suitable benchmark instances
per benchmark class

1 repeat

2 *ToRun* $\leftarrow \emptyset$ /* no runs scheduled yet */

3 **foreach** *C* in *Classes* **do**

4 *done* $\leftarrow |\text{Suitable}(\text{Used}[C])|$

5 **if** *done* < *max* **then**

ToRun $\leftarrow \text{ToRun} \cup \text{Select}(\text{max} - \text{done}, \text{Fresh}[C])$

6 Run(*ToRun*) /* execute the scheduled runs */

7 *Used* $\leftarrow \text{Used} \cup \text{ToRun}$

8 *Fresh* $\leftarrow \text{Fresh} \setminus \text{ToRun}$

9 **until** *ToRun* = \emptyset

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Participating ASP Systems I

Solver	Affiliation	MGS	SCore	SLparse
asper	Angers		ASPeR-call-script ASPeRS20-call-script ASPeRS30-call-script	
assat	Hongkong	script.assat.normal		script.assat.lparse-output
clasp	Potsdam	clasp_cmp_score clasp_cmp_score2 clasp_score_def	clasp_cmp_score_glp clasp_cmp_score_glp2 clasp_score_glp_def	clasp_cmp_slparse clasp_cmp_slparse2 clasp_slparse_def
cmodels	Texas	default scriptAtomreasonLp scriptEloopLp	defaultGlparsed.sh scriptAtomreasonGlparsed scriptEloopGlparsed disjGlparsedDefault [∇] disjGparsedEloop [∇] disjGparsedVerMin [∇]	groundedDefault scriptAtomreasonGr scriptEloopGr
dlv	Vienna/ Calabria	dlv-contest-special dlv-contest	dlv-contest-special* dlv-contest*	

Participating ASP Systems II

Solver	Affiliation	MGS	SCore	SLparse
gnt	Helsinki	gnt dencode+gnt dencode_bc+gnt	gnt_score* dencode+gnt_score* dencode_bc+gnt_score*	gnt_slparse dencode+gnt_slparse dencode_bc+gnt_slparse
lp2sat	Helsinki		lp2sat+minisat wf+lp2sat+minisat lp2sat+siege	
nomore	Potsdam	nomore-default nomore-localprop nomore-D	nomore-default-SCore nomore-localprop-SCore nomore-D-SCore	nomore-default-slparse nomore-localprop-slparse nomore-D-slparse
pbmodels	Kentucky	pbmodels-minisat+-MGS pbmodels-pueblo-MGS pbmodels-wsatcc-MGS	pbmodels-minisat+-SCore pbmodels-pueblo-SCore pbmodels-wsatcc-SCore	pbmodels-minisat+-SLparse pbmodels-pueblo-SLparse pbmodels-wsatcc-SLparse
smodels	Helsinki	smodels smodels_rs smodels_rsn	smodels_score smodels_rs_score smodels_rsn_score	smodels_slparse smodels_rs_slparse smodels_rsn_slparse

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Results

- MGS
- SCore
- SCore^v
- SLparse

Results

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Time limit 600 seconds execution time

Memory limit 448 MB RAM memory usage

Results

- MGS
- SCore
- SCore^v
- SLparse

Time limit 600 seconds execution time

Memory limit 448 MB RAM memory usage

 Only one place was allocated to each ASP system, although three variants were allowed to participate

Winners: MGS

Modeling, Grounding, Solving

Winners: MGS

Modeling, Grounding, Solving

3

Winners: MGS

Modeling, Grounding, Solving

clasp

(UP)

3

Winners: MGS

Modeling, Grounding, Solving

2

clasp

(UP)

3

Winners: MGS

Modeling, Grounding, Solving

pbmodels

(UK)

2

clasp

(UP)

3

Winners: MGS

Modeling, Grounding, Solving

pbmodels

(UK)

2

1

clasp

(UP)

3

Winners: MGS

Modeling, Grounding, Solving



Complete Ranking

Place	Call Script	Solved	%	min	max	avg	avg ^t	EuclDist
1	dlv-contest-special	76/119	63.87	0.07	565.38	54.31	251.49	3542.79
2	dlv-contest	66/119	55.46	0.06	579.09	49.73	294.81	3948.30
3	pbmodels-minisat+-MGS	65/111	58.56	0.52	563.39	83.27	297.41	4142.88
4	clasp_cmp_score2	64/111	57.66	0.87	579.14	115.35	320.56	4285.59
5	clasp_score_def	60/111	54.05	0.91	542.64	80.09	318.97	4277.69
6	clasp_cmp_score	58/111	52.25	0.83	469.46	87.40	332.16	4280.92
7	pbmodels-pueble-MGS	54/111	48.65	0.34	584.31	80.94	347.49	4491.85
8	default	51/119	42.86	0.23	453.88	64.96	370.7	4543.12
9	smodels_rs	34/118	28.81	0.30	539.33	153.86	471.45	5349.11
10	smodels	34/104	32.69	1.14	584.06	173.60	460.6	4974.14
11	pbmodels-wsatcc-MGS	23/111	20.72	1.05	563.52	136.97	504.06	5409.17
12	smodels_rsn	22/111	19.82	0.12	579.10	163.14	513.42	5471.81
13	nomore-default	13/111	11.71	22.04	521.11	315.78	566.71	5714.67
14	scriptAtomreasonLp	12/24	50.00	3.59	259.88	91.18	345.59	2121.13
15	nomore-localprop	10/111	9.01	19.54	521.03	324.83	575.21	5787.71
16	nomore-D	9/111	8.11	48.50	473.89	161.99	564.49	5763.96
17	scriptEloopLp	4/16	25.00	49.92	223.03	106.09	476.52	2088.98
18	gnt	0/8	0.00				600	1696.31
19	dencode+gnt	0/8	0.00				600	1696.31
20	dencode_bc+gnt	0/8	0.00				600	1696.31
21	script.assat.normal	0/50	0.00				600	4101.66

Complete Ranking

Benchmarks

Benchmark Class	#	Solved	%	SAT	%	UNSAT	%	min	max	avg
Sokoban	8	16/16	100.00	6/6	100.00	10/10	100.00	12.66	109.52	54.39
Weighted Spanning Tree	8	89/127	70.08	89/127	70.08	0/0		0.06	579.10	115.27
Social Golfer	8	75/120	62.50	59/75	78.67	16/45	35.56	0.23	579.09	40.34
Bounded Spanning Tree	8	73/127	57.48	73/127	57.48	0/0		0.23	519.09	65.47
Towers of Hanoi	8	71/136	52.21	71/136	52.21	0/0		1.74	584.31	101.10
Blocked N-Queens	8	60/120	50.00	44/75	58.67	16/45	35.56	6.50	542.64	181.69
Hamiltonian Cycle	8	64/150	42.67	64/150	42.67	0/0		0.88	453.88	57.46
Weighted Latin Square	8	41/120	34.17	22/45	48.89	19/75	25.33	0.12	477.67	93.04
Weight-bound Dom. Set	8	42/127	33.07	42/127	33.07	0/0		0.83	563.39	127.87
Schur Numbers	8	32/120	26.67	18/90	20.00	14/30	46.67	3.27	468.79	120.96
15-Puzzle	7	24/105	22.86	24/105	22.86	0/0		52.91	579.14	291.20
Car Sequencing	8	25/120	20.83	24/105	22.86	1/15	6.67	0.69	563.52	106.08
Fast Food	8	19/127	14.96	8/64	12.50	11/63	17.46	5.30	352.11	113.08
Traveling Salesperson	8	16/128	12.50	16/128	12.50	0/0		0.72	11.18	2.17
Reachability	8	8/160	5.00	6/120	5.00	2/40	5.00	0.26	169.90	49.48

Winners: SCore

Solver, Core language

Winners: SCore

Solver, Core language

3

Winners: SCore

Solver, Core language

cmodels

(UT)

3

Winners: SCore

Solver, Core language

2

cmodels

(UT)

3

Winners: SCore

Solver, Core language

smodels

(HUT)

2

cmmodels

(UT)

3

Winners: SCore

Solver, Core language

smodels

(HUT)

2

1

cmodels

(UT)

3

Winners: SCore

Solver, Core language



Complete Ranking

Place	Call Script	Solved	%	min	max	avg	avg ^t	EuclidDist
1	clasp_cmp_score_glp2	89/95	93.68	0.56	530.21	29.81	65.82	1080.46
2	clasp_cmp_score_glp	89/95	93.68	0.75	504.49	30.36	66.34	1099.14
3	clasp_score_glp_def	86/95	90.53	0.75	431.66	25.20	79.66	1386.63
4	smodels_rs_score	81/95	85.26	1.21	346.36	38.93	121.61	1872.81
5	defaultGlparsed.sh	81/95	85.26	1.35	597.97	46.86	128.38	2089.18
6	scriptAtomreasonGlparsed	80/95	84.21	1.30	576.80	42.40	130.44	2107.83
7	pbmodels-minisat+-SCore	80/95	84.21	0.72	436.11	57.18	142.89	2170.40
8	pbmodels-pueblo-SCore	78/95	82.11	0.34	452.84	41.00	141.03	2210.39
9	dencode+gnt_score	78/95	82.11	1.27	363.19	42.80	142.51	2162.64
10	smodels_score	77/95	81.05	1.28	352.41	40.40	146.43	2217.61
11	dencode_bc+gnt_score	77/95	81.05	1.27	360.70	42.52	148.15	2228.65
12	gnt_score	77/95	81.05	1.27	359.77	42.56	148.18	2228.83
13	scriptEloopGlparsed	75/95	78.95	1.36	598.20	42.86	160.15	2493.41
14	smodels_rsn_score	75/95	78.95	1.21	486.23	63.00	176.05	2503.32
15	lp2sat+minisat	75/95	78.95	1.10	561.06	79.89	189.39	2621.13
16	wf+lp2sat+minisat	73/95	76.84	1.56	587.40	86.42	205.35	2792.51
17	dlv-contest-special	69/95	72.63	0.24	586.62	102.47	238.64	3090.71
18	dlv-contest	68/95	71.58	0.24	587.83	96.69	239.74	3110.36
19	lp2sat+siege	68/95	71.58	1.11	471.36	97.50	240.32	3052.80
20	nomore-localprop-SCore	64/95	67.37	2.45	550.43	103.23	265.34	3316.33
21	nomore-default-SCore	63/95	66.32	2.45	554.76	124.62	284.75	3415.78
22	nomore-D-SCore	62/95	65.26	2.77	559.88	161.15	313.59	3583.85
23	ASPeR-call-script	24/95	25.26	1.47	592.24	98.28	473.25	4906.79
24	ASPeRS30-call-script	21/95	22.11	1.51	561.20	88.99	487.04	4995.78
25	ASPeRS20-call-script	21/95	22.11	1.49	381.33	89.40	487.13	4980.24
26	pbmodels-wsatcc-SCore	6/95	6.32	25.57	529.80	208.15	575.25	5514.97

Complete Ranking

Benchmarks

Benchmark Class	#	Solved	%	SAT	%	UNSAT	%	min	max	avg
15-Puzzle	10	236/260	90.77	121/130	93.08	115/130	88.46	0.74	480.13	25.49
Factoring	5	114/130	87.69	46/52	88.46	68/78	87.18	1.21	554.76	50.35
RLP-150	14	306/364	84.07	21/26	80.77	285/338	84.32	0.34	205.03	22.01
RLP-200	14	287/364	78.85	0/0		287/364	78.85	0.39	581.98	75.21
Schur Numbers	5	99/130	76.15	88/104	84.62	11/26	42.31	2.76	561.20	49.82
EqTest	5	93/130	71.54	0/0		93/130	71.54	0.66	592.24	75.02
Hamiltonian Path	14	219/364	60.16	201/338	59.47	18/26	69.23	0.24	559.88	64.74
Random Non-Tight	14	216/364	59.34	38/52	73.08	178/312	57.05	0.57	598.20	121.87
Blocked N-Queens	14	167/364	45.88	55/156	35.26	112/208	53.85	13.70	587.40	110.59

Winners: SCore^v

Solver, Disjunctive Core language

Winners: SCore^v

Solver, Disjunctive Core language

3

Winners: SCore^v

Solver, Disjunctive Core language

gnt
(HUT)

3

Winners: SCore^v

Solver, Disjunctive Core language

2

gnt
(HUT)

3

Winners: SCore^v

Solver, Disjunctive Core language

cmodels

(UT)

2

gnt

(HUT)

3

Winners: SCore^v

Solver, Disjunctive Core language

cmodels
(UT)

2

1

gnt
(HUT)

3

Winners: SCore^v

Solver, Disjunctive Core language



Complete Ranking

Place	Call Script	Solved	%	min	max	avg	avg ^t	EuclDist
1	dlv-contest-special	54/55	98.18	0.03	258.73	23.59	34.07	279.35
2	dlv-contest	54/55	98.18	0.03	259.97	23.86	34.33	279.44
3	disjGparseDefault	33/55	60.00	1.06	521.59	54.49	272.69	2631.40
4	dencode+gnt_score	29/55	52.73	2.23	521.51	56.34	313.34	2922.73
5	gnt_score	29/55	52.73	2.21	521.91	56.44	313.4	2922.87
6	dencode_bc+gnt_score	29/55	52.73	2.22	522.63	56.45	313.4	2923.17
7	disjGparseEloop	27/55	49.09	1.21	521.55	33.83	322.06	2978.46
8	disjGparseVerMin	27/55	49.09	1.22	523.40	33.98	322.14	2978.77

Complete Ranking

Benchmarks

Benchmark Class	#	Solved	%	SAT	%	UNSAT	%	min	max	avg
Grammar-based Info.Extra.	15	120/120	100.00	64/64	100.00	56/56	100.00	0.62	7.86	5.03
Disjunctive Loops	3	21/24	87.50	0/0		21/24	87.50	0.44	522.63	95.24
Strategic Companies	15	88/120	73.33	88/120	73.33	0/0		0.35	523.40	71.22
Mutex	7	18/56	32.14	0/0		18/56	32.14	0.03	259.97	37.41
Random QBFs	15	35/120	29.17	0/0		35/120	29.17	0.11	290.99	44.41

Winners: SLparse

Solver, Lparse language

Winners: SLparse

Solver, Lparse language

3

Winners: SLparse

Solver, Lparse language

smodels

(HUT)

3

Winners: SLparse

Solver, Lparse language

2

smodels

(HUT)

3

Winners: SLparse

Solver, Lparse language

pbmodels

(UK)

2

smodels

(HUT)

3

Winners: SLparse

Solver, Lparse language

pbmodels

(UK)

2

1

smodels

(HUT)

3

Winners: SLparse

Solver, Lparse language



Complete Ranking

Place	Call Script	Solved	%	min	max	avg	avg ^t	EuclDist
1	clasp_cmp_slparse2	100/127	78.74	0.38	556.49	75.96	187.37	2791.89
2	clasp_cmp_slparse	94/127	74.02	0.41	502.53	61.37	201.33	2919.46
3	pbmodels-minisat+-SLparse	91/127	71.65	0.49	503.57	76.69	225.03	3241.06
4	clasp_slparse_def	89/127	70.08	0.37	546.50	55.62	218.5	3152.34
5	smodels_rs_slparse	87/127	68.50	0.23	576.28	95.92	254.69	3403.90
6	groundedDefault	81/127	63.78	0.25	407.49	46.20	246.79	3448.34
7	scriptAtomreasonGr	81/127	63.78	0.25	407.46	50.55	249.56	3465.67
8	scriptEloopGr	78/127	61.42	0.24	407.48	46.15	259.84	3598.70
9	smodels_slparse	75/127	59.06	0.26	518.08	102.76	306.35	3958.86
10	smodels_rsn_slparse	74/127	58.27	0.35	596.39	70.52	291.49	3815.31
11	pbmodels-pueblo-SLparse	69/127	54.33	0.25	593.05	87.25	321.42	4189.03
12	nomore-D-slparse	54/127	42.52	1.08	530.39	152.78	409.84	4765.06
13	nomore-localprop-slparse	50/127	39.37	1.08	517.63	120.80	411.34	4846.58
14	nomore-default-slparse	49/127	38.58	1.08	549.80	143.44	423.85	4920.23
15	gnt_slparse	35/127	27.56	2.10	482.13	81.40	457.08	5276.26
16	dencode+gnt_slparse	35/127	27.56	2.18	482.81	81.64	457.15	5276.38
17	dencode_bc+gnt_slparse	35/127	27.56	2.10	485.36	81.70	457.16	5276.53
18	script.assat.lparse-output	30/127	23.62	1.00	225.28	38.64	467.4	5379.18
19	pbmodels-wsatcc-SLparse	25/127	19.69	1.12	272.98	46.56	491.05	5585.82

Complete Ranking


Benchmarks

Benchmark Class	#	Solved	%	SAT	%	UNSAT	%	min	max	avg
RLP-200	5	89/95	93.68	18/19	94.74	71/76	93.42	0.25	465.69	60.94
RLP-150	5	87/95	91.58	17/19	89.47	70/76	92.11	0.25	183.29	14.17
Factoring	4	69/76	90.79	36/38	94.74	33/38	86.84	0.63	549.80	64.09
verifyTest (TOAST)	5	81/95	85.26	81/95	85.26	0/0		0.24	303.32	16.43
Random Non-Tight	5	75/95	78.95	41/57	71.93	34/38	89.47	0.41	518.08	123.56
Knight's Tour	5	71/95	74.74	71/95	74.74	0/0		1.04	248.97	28.29
Su-Doku	3	42/57	73.68	42/57	73.68	0/0		18.15	176.69	68.00
searchTest-plain (TOAST)	5	68/95	71.58	18/38	47.37	50/57	87.72	1.54	339.51	45.50
searchTest-verbose (TOAST)	5	63/95	66.32	63/95	66.32	0/0		25.84	485.36	136.07
Hamiltonian Path	5	60/95	63.16	60/95	63.16	0/0		0.37	530.39	58.02
Weighted Spanning Tree	5	58/95	61.05	58/95	61.05	0/0		3.24	596.39	122.04
Solitaire Forward	5	55/95	57.89	55/95	57.89	0/0		1.19	593.05	49.06
Bounded Spanning Tree	5	54/95	56.84	54/95	56.84	0/0		7.43	413.63	70.11
Hamiltonian Cycle	5	51/95	53.68	51/95	53.68	0/0		0.47	464.71	51.30
Solitaire Backward	5	47/95	49.47	33/76	43.42	14/19	73.68	0.30	552.11	71.72
Towers of Hanoi	5	43/95	45.26	43/95	45.26	0/0		6.28	478.30	169.96
Blocked N-Queens	5	40/95	42.11	36/76	47.37	4/19	21.05	1.57	590.04	193.59
Social Golfer	5	37/95	38.95	24/38	63.16	13/57	22.81	0.84	291.48	30.70
Schur Numbers	5	31/95	32.63	11/57	19.30	20/38	52.63	1.23	496.82	104.57
Hashiwokakero	5	26/95	27.37	0/0		26/95	27.37	6.71	377.69	72.36
Weighted Latin Square	5	23/95	24.21	6/19	31.58	17/76	22.37	0.23	576.28	144.13
15-Puzzle	5	17/95	17.89	17/95	17.89	0/0		106.66	502.53	327.56
Weight-bounded Dom. Set	5	15/95	15.79	15/95	15.79	0/0		1.55	467.51	112.55
Traveling Salesperson	5	12/95	12.63	12/95	12.63	0/0		0.35	212.66	20.24
Solitaire Backward (2)	5	11/95	11.58	11/95	11.58	0/0		5.32	330.89	101.55
Car Sequencing	5	7/95	7.37	7/95	7.37	0/0		7.17	556.49	249.51

Agenda

- Prelude
- Setting
- Benchmarks
- ASP Systems
- Results
- Lessons

Major Lessons

- Lack of well-defined
 - input languages,
 - intermediate languages,
 - output languages, as well as
 - error signaling
- ( ASP Language Forum, SEA'07)
- Need for more modeling practice
 - Grounding is of equal importance

And last but not least

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Thank you all so much for your
support and patience!!