

TABLE I: ISM-benchmark results

Benchmark	Q	Exact Approaches												Heuristic Approaches							
		MeMin (M)			Bica (B)				Stamina (SE)					Cosme (C)				Stamina (SH)			
		Q	Time	stdev	Q	Time	stdev	B/M	Q	Time	stdev	SE/M	Q	Time	stdev	C/M	Q	Time	stdev	SH/M	
alex1	42	6	.0011	2.95%	6	.2870	0.27%	260.90	6	.1291	0.16%	117.36	6	.0072	1.67%	6.54	6	.1361	0.09%	123.72	
intel_edge.dummy	28	4	.0008	2.21%	4	.0396	0.29%	49.50	5 <sup>1</sup>	.0033	0.30%	4.12	5	.0032	0.25%	4.00	5	.0048	0.25%	6.00	
isend	40	4	.0010	1.59%	4	.1594	0.07%	159.40	4	.0103	0.11%	10.30	4	.0072	1.51%	7.20	4	.0125	0.19%	12.50	
pe-rcv-ifc.fc	46	2	.0008	2.43%	2	.1469	0.16%	183.62	2	.0021	0.51%	2.62	2	.0083	0.33%	10.37	2	.0025	0.46%	3.12	
pe-rcv-ifc.fc.m	27	2	.0007	2.91%	2	.0837	0.23%	119.57	2	.0009	0.82%	1.28	2	.0039	0.67%	5.57	2	.0010	0.57%	1.42	
pe-send-ifc.fc	70	2	.0011	1.52%	2	.4558	0.47%	414.36	2	.0089	0.09%	8.09	2	.0224	0.42%	20.36	2	.0098	2.34%	8.90	
pe-send-ifc.fc.m	26	2	.0008	2.34%	2	.1729	0.27%	216.12	2	.0009	1.37%	1.12	2	.0040	0.15%	5.00	2	.0009	0.80%	1.12	
vbe4a	58	3	.0012	1.29%	3	.3702	0.08%	308.50	3	1.6005	0.02%	1333.75	3	.0163	0.36%	13.58	3	1.6815	0.02%	1401.25	
vmebus.master.m	32	2	.0020	2.37%	2	13.3897	0.09%	6694.85	2	.0048	0.33%	2.40	2	.0113	0.65%	5.65	2	.0049	0.17%	2.45	
fo.16	17	3	.0006	4.05%	3	.0188	0.60%	31.33	3	2.9122	0.08%	4853.66	3	.0015	0.88%	2.50	3	.0005	1.96%	.83	
fo.20	21	3	.0005	3.28%	3	.0225	0.65%	45.00	6	2.0142	0.01%	4028.40	3	.0018	0.26%	3.60	10	.0009	1.64%	1.80	
fo.30	31	3	.0007	2.47%	3	.0304	0.28%	43.42	5	3.8240	0.01%	5462.85	3	.0027	0.36%	3.85	10	.0048	0.56%	6.85	
fo.40	41	4	.0015	1.71%	4	.1389	0.21%	92.60	5	11.5049	0.01%	7669.93	6	.0040	0.32%	2.66	10	.1386	0.05%	92.40	
fo.50	51	6	.0043	1.01%	6	.0999	0.07%	23.23	5	7.2752	0.09%	1691.90	6	.0052	1.09%	1.20	10	.0336	0.32%	7.81	
fo.60	61	7	.1692	0.13%	7	149.9053	0.70%	885.96	5	9.8675	0.06%	58.31	10	.0093	2.15%	.05	10	.0864	1.23%	.51	
fo.70	71	7	.1894	0.18%	3	—	—	—	5	9.1619	0.09%	48.37	9	.0100	0.29%	.05	10	.1259	0.11%	.66	
th.20	21	4	.0007	2.45%	4	.0227	0.79%	32.42	6	4.3983	0.05%	6283.28	4	.0018	0.34%	2.57	10	.0014	0.73%	2.00	
th.25	26	4	.0007	3.26%	4	.0264	0.23%	37.71	6	2.0331	0.02%	2904.42	4	.0025	0.71%	3.57	10	.0011	1.68%	1.57	
th.30	31	5	.0006	3.31%	5	.0343	0.12%	57.16	6	12.2109	0.03%	20351.50	6	.0029	0.21%	4.83	10	.0024	0.40%	4.00	
th.35	36	7	.0008	2.01%	7	.0410	0.10%	51.25	5	9.5360	0.01%	11920.00	7	.0036	0.39%	4.50	10	.0026	0.57%	3.25	
th.40	41	8	.0009	2.03%	8	.0481	0.07%	53.44	5	4.5429	0.06%	5047.66	8	.0042	0.53%	4.66	10	.0048	0.87%	5.33	
th.55	55	8	.0015	1.22%	8	25.1838	0.17%	16789.20	5	7.2665	0.00%	4844.33	10	.0066	0.13%	4.40	10	.0293	0.45%	19.53	
ifsm0	38	3	.0009	1.81%	3	.0520	0.07%	57.77	3	.0012	0.72%	1.33	3	.0098	0.27%	10.88	3	.0012	0.81%	1.33	
ifsm1	74	14	.0016	1.38%	14	.1488	0.05%	93.00	6	1.4877	0.03%	929.81	14	.0140	0.12%	8.75	10	.0026	0.31%	1.62	
ifsm2	48	9	.0015	1.10%	9	3.0301	0.21%	2020.06	9	5.2103	0.05%	3473.53	3	.0058	0.41%	3.86	10	.0024	0.37%	1.60	
rubin1200	1200	3	.0374	0.15%	3	1.9400	0.03%	51.87	1200	1.4046	1.10%	10.81	15	2.0928	0.05%	55.95	1200	.4101	1.43%	10.96	
rubin18	18	3	.0005	3.53%	3	.0083	0.50%	16.60	3	.0051	0.35%	10.20	3	.0014	0.26%	2.80	3	.0004	2.01%	.80	
rubin2250	2250	3	.1601	0.11%	3	11.9879	0.04%	74.87	2250	2.6435	0.71%	16.51	15	4.0188	0.06%	25.10	2250	2.6564	0.63%	16.59	
rubin600	600	3	.0088	0.27%	3	.2803	0.07%	31.85	600	.0542	0.79%	6.15	15	1.1732	0.67%	133.31	600	.0532	1.26%	6.04	
e271	19	2	.0005	3.01%	2	.0580	0.08%	116.00	2	.0005	1.65%	1.00	2	.0020	0.41%	4.00	2	.0005	1.57%	1.00	
e285	19	2	.0006	2.69%	2	.0240	0.16%	40.00	2	.0005	1.72%	.83	2	.0019	0.27%	3.16	2	.0005	1.64%	.83	
e304	19	2	.0006	2.93%	2	.0231	0.14%	38.50	2	.0005	1.84%	.83	19	.0021	0.35%	3.50	2	.0005	1.91%	.83	
e423	19	2	.0005	2.80%	2	.0331	0.10%	66.20	5	3.5725	0.03%	7145.00	19	.1175	0.04%	235.00	10	.0017	0.58%	3.40	
e680	19	2	.0005	2.93%	2	.0271	0.18%	54.20	2	.0005	1.58%	1.00	19	.0044	0.29%	8.80	2	.0005	1.69%	1.00	

<sup>1</sup>Invalid result    <sup>2</sup>Result not minimal    <sup>3</sup>Timeout    <sup>4</sup>Out of memory    <sup>5</sup>Segmentation fault  
<sup>6</sup>\*\*\* glibc detected \*\*\* ./stamina: double free or corruption    <sup>7</sup>Panic: Mapping    <sup>8</sup>Panic: Not closed prime    <sup>9</sup>\*Inconsistent machine detected.



TABLE III: Evaluation of MEMIN

Benchmark	Q	Q <sub>m</sub>	P	Solution times [ms]			
				SAT only	SAT+LB	SAT+LB+PS	SAT share
alex1	42	6	6	5.9	2.9	1.1	35%
intel_edge.dummy	28	4	3	1.7	1.6	.8	36%
isend	40	4	4	2.1	1.6	1.0	35%
pe-rcv-ifc.fc	46	2	2	1.4	1.3	.8	19%
pe-rcv-ifc.fc.m	27	2	2	1.3	1.2	.7	17%
pe-send-ifc.fc	70	2	2	1.9	1.7	1.1	23%
pe-send-ifc.fc.m	26	2	2	1.5	1.3	.8	16%
vbe4a	58	3	3	2.2	1.8	1.2	32%
vmebus.master.m	32	2	2	2.7	2.5	2.0	14%
fo.16	17	3	2	1.1	1.1	.6	30%
fo.20	21	3	3	1.1	1.0	.5	20%
fo.30	31	3	2	1.2	1.2	.7	38%
fo.40	41	4	4	3.2	2.9	1.5	66%
fo.50	51	6	5	16.0	15.1	4.3	87%
fo.60	61	7	6	116423.5	117156.3	169.2	99%
fo.70	71	7	4	116371.3	114812.6	189.4	99%
th.20	21	4	3	1.4	1.3	.7	42%
th.25	26	4	3	1.3	1.2	.7	40%
th.30	31	5	5	2.2	1.7	.6	31%
th.35	36	7	7	8.1	2.0	.8	42%
th.40	41	8	8	40.1	2.2	.9	45%
th.55	55	8	8	94.1	8.5	1.5	63%
ifsm0	38	3	3	2.2	1.9	.9	9%
ifsm1	74	14	13	timeout	timeout	1.6	54%
ifsm2	48	9	9	1616.7	7.2	1.5	35%
rubin1200	1200	3	3	39.6	37.8	37.4	13%
rubin18	18	3	3	1.0	1.0	.5	17%
rubin2250	2250	3	3	163.9	159.3	160.1	8%
rubin600	600	3	3	10.1	9.3	8.8	20%
e271	19	2	2	1.1	1.1	.5	15%
e285	19	2	2	1.1	1.0	.6	15%
e304	19	2	2	1.3	1.0	.6	17%
e423	19	2	2	1.1	1.0	.5	14%
e680	19	2	2	1.1	1.0	.5	15%
bbara	10	7	7	7.8	1.4	.5	9%
bbsse	16	13	13	timeout	8.1	.9	14%
bbtas	6	6	6	2.2	1.2	.5	8%
beecount	7	4	4	1.3	1.2	.5	11%
cse	16	16	16	timeout	4.2	.8	13%
dk14	7	7	7	10.1	1.6	.6	9%
dk15	4	4	4	1.3	1.1	.5	8%
dk16	27	27	27	timeout	32.7	.9	16%
dk17	8	8	8	30.9	1.6	.5	9%
dk27	7	7	7	5.8	1.3	.4	9%
dk512	15	15	15	timeout	3.4	.5	12%
donfile	24	1	1	1.0	1.0	.5	8%
ex1	20	18	18	timeout	9.3	1.0	12%
ex2	19	5	4	3.8	3.5	.9	48%
ex3	10	4	2	1.6	1.6	.8	47%
ex4	14	14	14	timeout	3.0	.5	13%
ex5	9	3	2	1.1	1.0	.5	22%
ex6	8	8	8	39.3	1.6	.5	11%
ex7	10	3	3	1.1	1.0	.5	16%
keyb	19	19	19	timeout	6.9	1.1	13%
kirkman	16	16	16	timeout	5.9	2.1	9%
lion9	9	4	4	1.2	1.0	.4	11%
lion	4	4	4	1.2	1.0	.4	8%
mark1	15	12	12	timeout	9.5	1.0	35%
mc	4	4	4	1.2	1.0	.4	8%
modulo12	12	1	1	1.0	.9	.4	8%
opus	10	9	9	265.3	1.7	.5	10%
planet1	48	48	48	timeout	78.7	1.4	26%
planet	48	48	48	timeout	78.3	1.4	26%
pma	24	24	24	timeout	8.1	.8	17%
s1488	48	48	48	timeout	137.7	2.0	22%
s1494	48	48	48	timeout	134.0	2.0	23%
s1a	20	1	1	3.3	3.2	2.7	8%
s1	20	20	20	timeout	8.3	1.0	15%
s208	18	18	18	timeout	7.6	1.0	13%
s27	6	5	5	1.7	1.2	.5	9%
s298	218	135	135	timeout	5273.0	9.7	36%
s386	13	13	13	timeout	3.0	.7	13%
s420	18	18	18	timeout	8.7	1.0	13%
s510	47	47	47	timeout	89.6	1.2	30%
s820	25	24	24	timeout	16.6	1.5	15%
s832	25	24	24	timeout	18.9	1.6	15%
s8	5	1	1	.9	.9	.4	7%
sand	32	32	32	timeout	32.9	1.5	18%
scf	121	97	97	timeout	1492.3	3.3	45%
shiftreg	8	8	8	37.6	1.7	.4	9%
sse	16	13	13	timeout	8.2	.9	14%
styr	30	30	30	timeout	29.4	1.2	17%
tav	4	4	4	1.2	1.1	.5	7%
tbk	32	16	16	timeout	35.5	3.5	6%
tma	20	18	18	timeout	4.7	.7	20%
train11	11	4	4	1.2	1.1	.5	12%
train4	4	4	4	1.1	1.0	.4	8%