

First benchmark on jjs-bdd0.1alpha1

What we did in this benchmark was to compare runtimes of the elder jjs-bdd0.01 to the new library jjs-bdd0.1alpha1 released in dezember 2003. The benchmark creates the SUM function for two input vectors of length n . The first table shows the results obtained by an sobdd of polynomial size based on a good natured variable order $\pi = (x_1, y_1, x_2, y_2, \dots, x_n, y_n)$, while the second sobdd uses an offensive variable order $\pi' = (x_1, x_2, \dots, x_n, y_1, y_2, \dots, y_n)$, which causes exponential size of the resulting sobdd. Both tables show the input size n , computation time in seconds of the old and new package and the number of nodes im memory during the computation. The new package provides a user defined garbage collection delay, which leads to a more effective computation by investing a little more memory. The tables show both of the extreme values for this delay, where 'GC(0)' causes the memory to be freed immediately (just like in the old version), while 'GC(∞)' keeps all nodes in memory for a possible later usage.

Results:

n	old(time(s))	new(time(s)) GC(∞)	new(time(s)) GC(0)	new(nodes) GC(∞)	new=old (nodes) GC(0)
8	0.03	0.01	0.03	230	172
16	0.08	0.05	0.06	1026	724
32	0.20	0.08	0.09	4346	2980
64	0.66	0.20	0.22	17898	12100
128	2.41	0.67	0.79	72650	48772
256	9.18	2.64	3.07	292746	195844
512	33.45	10.54	12.80	1175306	784900
1024	-	< ∞	< ∞	4709898	3142660

As one can see in this table, our new release is at about three times faster in this case.

n	old(time(s))	new(time(s)) GC(∞)	new(time(s)) GC(0)	new(nodes) GC(∞)	new=old (nodes) GC(0)
8	0.07	0.04	0.03	1500	1253
12	0.82	0.61	0.61	24524	20441
14	4.17	3.22	3.40	98244	81875
15	9.65	7.15	7.51	196544	163792
16	22.13	16.11	17.76	393148	327629
17	50.63	38.64	41.24	786360	655306
18	115.11	91.30	92.01	1572788	1310663
19	268.26	206.30	202.52	3145648	2621380
20	-	-	< ∞	-	5242817

As shown in the second table, we save at about $\frac{1}{4}$ of computation time and it was the first time we kept more than five million nodes in memory on a computer with just 512Mb of RAM.