

Column1	Column2
Execution Time(parse sig)	0.000788
Execution Time(translate signature)	0.000291
Execution Time(compile, link, and start simulator)	0.001538
Execution Time(parse query)	0.000048
Execution Time(parse query)	0.000056
Execution Time(parse query)	0.000048
Execution Time(parse query)	0.000059
Execution Time(parse query)	0.000069
Execution Time(translate query)	0.000013
Execution Time(translate query)	0.000013
Execution Time(translate query)	0.000013
Execution Time(translate query)	0.000016
Execution Time(translate query)	0.000017
Execution Time(set up simulator to solve query)	0.000012
Execution Time(set up simulator to solve query)	0.000015
Execution Time(set up simulator to solve query)	0.000015
Execution Time(set up simulator to solve query)	0.000017
Execution Time(set up simulator to solve query)	0.000019
Execution Time(solve query)	0.000582
Execution Time(solve query)	0.001476
Execution Time(solve query)	0.002795
Execution Time(solve query)	0.00421
Execution Time(solve query)	0.005849
Execution Time(build term)	0.001125
Execution Time(build term)	0.005539
Execution Time(build term)	0.01448
Execution Time(build term)	0.033781
Execution Time(build term)	0.055161
Execution Time(invert term)	0.000009
Execution Time(invert term)	0.000012
Execution Time(invert term)	0.000016
Execution Time(invert term)	0.00002
Execution Time(invert term)	0.000021
Execution Time(print solution)	0.000043
Execution Time(print solution)	0.000175
Execution Time(print solution)	0.000056
Execution Time(print solution)	0.001828
Execution Time(print solution)	0.000082

Twelf					
parsing	0	0	0	0	0
reconstruction	0	0	0	0	0
solving	0.001	0.005	0.009	0.015	0.018
printing	0	0.001	0.001	0.005	0.001
total	0.002	0.007	0.011	0.021	0.02

Tjtwelf					
Set up	0.002617				
Solving	0.000664	0.001572	0.002887	0.004322	0.005975
Printing	0.000043	0.000175	0.000056	0.001828	0.000082

Column1	Column2
Execution Time(parse sig)	0.001741
Execution Time(translate signature)	0.000407
Execution Time(compile, link, and start simulator)	0.001886
Execution Time(parse query)	0.000149
Execution Time(parse query)	0.00013
Execution Time(parse query)	0.001935
Execution Time(parse query)	0.001189
Execution Time(translate query)	0.000025
Execution Time(translate query)	0.001783
Execution Time(translate query)	0.000035
Execution Time(translate query)	0.000084
Execution Time(set up simulator to solve query)	0.000032
Execution Time(set up simulator to solve query)	0.000032
Execution Time(set up simulator to solve query)	0.000042
Execution Time(set up simulator to solve query)	0.000052
Execution Time(solve query)	0.020937
Execution Time(solve query)	0.072349
Execution Time(solve query)	0.181402
Execution Time(solve query)	0.372285
Execution Time(build term)	0.105905
Execution Time(build term)	0.674736
Execution Time(build term)	2.104321
Execution Time(build term)	4.581772
Execution Time(invert term)	0.000017
Execution Time(invert term)	0.000026
Execution Time(invert term)	0.000037
Execution Time(invert term)	0.000047
Execution Time(print solution)	0.000055
Execution Time(print solution)	0.000092
Execution Time(print solution)	0.000145
Execution Time(print solution)	0.000291

## Twelf

parsing	0.001
reconstruction	0.003
solving	0.036
printing	0.001
total	0.041

0.002	0.003	0.002
0.001	0.001	0.001
0.128	0.271	0.387
0.001	0.002	0.002
0.133	0.276	0.393

### **Tjtwelf**

Set up	0.004034	
Solving	0.02116	0.07432
Printing	0.000055	0.000092

0.183451 0.373657  
0.000145 0.000291

Column1	Column2
Execution Time(parse sig)	0.003244
Execution Time(translate signature)	0.001483
Execution Time(compile, link, and start simulator)	0.004721
Execution Time(parse query)	0.000102
Execution Time(parse query)	0.000472
Execution Time(parse query)	0.00014
Execution Time(parse query)	0.000168
Execution Time(parse query)	0.000227
Execution Time(translate query)	0.000024
Execution Time(translate query)	0.000022
Execution Time(translate query)	0.000031
Execution Time(translate query)	0.000038
Execution Time(translate query)	0.000044
Execution Time(set up simulator to solve query)	0.000019
Execution Time(set up simulator to solve query)	0.000018
Execution Time(set up simulator to solve query)	0.000025
Execution Time(set up simulator to solve query)	0.00003
Execution Time(set up simulator to solve query)	0.000034
Execution Time(solve query)	0.004894
Execution Time(solve query)	0.031741
Execution Time(solve query)	0.115061
Execution Time(solve query)	0.308199
Execution Time(solve query)	0.68063
Execution Time(build term)	0.008049
Execution Time(build term)	0.051968
Execution Time(build term)	0.165158
Execution Time(build term)	0.36418
Execution Time(build term)	0.671125
Execution Time(invert term)	0.00001
Execution Time(invert term)	0.000016
Execution Time(invert term)	0.000019
Execution Time(invert term)	0.000024
Execution Time(invert term)	0.000028
Execution Time(print solution)	0.00002
Execution Time(print solution)	0.000032
Execution Time(print solution)	0.00007
Execution Time(print solution)	0.000057
Execution Time(print solution)	0.000072

<b>Twelf</b>	
parsing	0.001
reconstruction	0.002
solving	0.011
printing	0.004
total	0.021

0.002	0.002	0.001	0.001
0.002	0.005	0.004	0.004
0.047	0.115	0.202	0.342
0.003	0.004	0.002	0.003
0.06	0.127	0.212	0.251

### Tjtwelf

Set up	0.009448	
Solving	0.005049	0.032269
Printing	0.00002	0.000032

0.115276	0.308459	0.680963
0.00007	0.000057	0.000072

Column1	Column2
Execution Time(parse sig)	0.000466
Execution Time(translate signature)	0.000117
Execution Time(compile, link, and start simulator)	0.000652
Execution Time(parse query)	0.000064
Execution Time(parse query)	0.00009
Execution Time(parse query)	0.00008
Execution Time(parse query)	0.00009
Execution Time(parse query)	0.000113
Execution Time(translate query)	0.000015
Execution Time(translate query)	0.00002
Execution Time(translate query)	0.000016
Execution Time(translate query)	0.00002
Execution Time(translate query)	0.00004
Execution Time(set up simulator to solve query)	0.000016
Execution Time(set up simulator to solve query)	0.000018
Execution Time(set up simulator to solve query)	0.000017
Execution Time(set up simulator to solve query)	0.000023
Execution Time(set up simulator to solve query)	0.000027
Execution Time(solve query)	0.000087
Execution Time(solve query)	0.000365
Execution Time(solve query)	0.001028
Execution Time(solve query)	0.002088
Execution Time(solve query)	0.003295
Execution Time(build term)	0.000517
Execution Time(build term)	0.001745
Execution Time(build term)	0.006589
Execution Time(build term)	0.017004
Execution Time(build term)	0.030919
Execution Time(invert term)	0.000007
Execution Time(invert term)	0.000008
Execution Time(invert term)	0.000012
Execution Time(invert term)	0.000015
Execution Time(invert term)	0.000017
Execution Time(print solution)	0.00003
Execution Time(print solution)	0.000025
Execution Time(print solution)	0.000039
Execution Time(print solution)	0.00005
Execution Time(print solution)	0.000056

<b>Twelf</b>	
parsing	0
reconstruction	0
solving	0
printing	0
total	0.001



0	0	0	0
0	0	0	0
0.004	0.005	0.008	0.012
0.003	0	0	0.001
0.008	0.006	0.009	0.014

### Tjtwelf

Set up	0.001235	
Solving	0.000189	0.000501
Printing	0.00003	0.000025

0.001153	0.002236	0.003492
0.000039	0.00005	0.000056

## Solving Time

Example	Twelf	Tjtwelf	ratio
reverse 1	0	0.000189	#DIV/0!
reverse 2	0.004	0.000501	0.12525
reverse 3	0.005	0.001153	0.2306
reverse 4	0.008	0.002236	0.2795
reverse 5	0.012	0.003492	0.291
miniml 1	0.001	0.000664	0.664
miniml 2	0.005	0.001572	0.3144
miniml 3	0.009	0.002887	0.320777778
miniml 4	0.015	0.004322	0.288133333
miniml 5	0.018	0.005975	0.331944444
miniml-typed 1	0.036	0.02116	0.587777778
miniml-typed 2	0.128	0.07432	0.580625
miniml-typed 3	0.271	0.183451	0.676940959
miniml-typed 4	0.387	0.373657	0.965521964
perm 1	0.011	0.005049	0.459
perm 2	0.047	0.032269	0.686574468
perm 3	0.115	0.115276	1.0024
perm 4	0.202	0.308459	1.527024752
perm 5	0.342	0.680963	1.991119883