

RTE Tool Output Summary

C File	Goals	Proved	Qed	Timeout	Term.	Unreach.	Alt-Ergo	Assigns Missing
01-abs-0.c	1	2 / 3	0	1	1	1	0	Yes
01-abs-1.c	2	3 / 4	1	1	1	1	0	Yes
01-abs-2.c	4	6 / 6	4	0	1	1	0	No
01-abs-3.c	5	7 / 7	5	0	1	1	0	No
02-max-0.c	2	4 / 4	2	0	1	1	0	Yes
02-max-1.c	5	5 / 7	3	2	1	1	0	Yes
02-max-2.c	1	3 / 3	0	0	1	1	1	Yes
02-max-3.c	6	7 / 8	4	1	1	1	1	Yes
02-max-4.c	8	10 / 10	7	0	1	1	1	Yes
03-max_ptr-0.c	4	4 / 6	2	2	1	1	0	Yes
03-max_ptr-1.c	6	6 / 8	4	2	1	1	0	Yes
03-max_ptr-2.c	6	8 / 8	4	0	1	1	2	Yes
03-max_ptr-3.c	4	6 / 6	3	0	1	1	1	Yes
03-max_ptr-4.c	8	10 / 10	6	0	1	1	2	No
04-incr_a_by_b-0.c	5	3 / 7	0	4	1	1	1	Yes
04-incr_a_by_b-1.c	7	9 / 9	4	0	1	1	3	No
04-incr_a_by_b-fail.c	7	8 / 9	4	1	1	1	2	No
04-swap-0.c	6	4 / 8	2	4	1	1	0	Yes
04-swap-1.c	12	14 / 14	9	0	1	1	3	Yes
05-abs-0.c	1	2 / 3	0	1	1	1	0	Yes
05-abs-1.c	7	9 / 9	7	0	1	1	0	No
05-abs-2.c	6	8 / 8	6	0	1	1	0	No
06-max_abs-0.c	2	2 / 2	2	0	—	—	0	Yes
06-max_abs-1.c	13	11 / 13	9	2	—	—	2	Yes
06-max_abs-2.c	13	12 / 13	11	1	—	—	1	Yes
06-max_abs-3.c	13	13 / 13	11	0	—	—	2	Yes
07-reset_array-0.c	3	2 / 4	1	2	—	1	0	Yes
07-reset_array-1.c	13	15 / 15	9	0	1	1	4	No
08-binary_search-1.c	27	29 / 29	13	0	1	1	14	No
09-sqrt-0.c	6	4 / 7	2	3	—	1	1	Yes

Z3 Prover Output Summary

C File	Goals	Proved	Qed	Timeout	Term.	Unreach.	Z3	Assigns Missing
01-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
01-abs-1.c	1	3 / 3	1	1	1	0	0	Yes
01-abs-2.c	3	5 / 5	1	1	3	0	0	No
01-abs-3.c	4	6 / 6	1	1	4	0	0	No
02-max-0.c	2	4 / 4	1	1	2	0	0	Yes
02-max-1.c	5	5 / 7	1	1	3	0	2	Yes
02-max-2.c	1	3 / 3	1	1	0	1	0	Yes
02-max-3.c	6	7 / 8	1	1	4	1	1	Yes
02-max-4.c	8	10 / 10	1	1	7	1	0	Yes
03-max_ptr-0.c	0	2 / 2	1	1	0	0	0	Yes
03-max_ptr-1.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-2.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-3.c	2	4 / 4	1	1	1	1	0	Yes
03-max_ptr-4.c	4	6 / 6	1	1	4	0	0	No
04-incr_a_by_b-0.c	0	2 / 2	1	1	0	0	0	Yes
04-incr_a_by_b-1.c	2	4 / 4	1	1	1	1	0	No
04-incr_a_by_b-fail.c	2	3 / 4	1	1	1	0	1	No
04-swap-0.c	2	4 / 4	1	1	2	0	0	Yes
04-swap-1.c	8	10 / 10	1	1	7	1	0	Yes
05-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
05-abs-1.c	6	8 / 8	1	1	6	0	0	No
05-abs-2.c	5	7 / 7	1	1	5	0	0	No
06-max_abs-0.c	2	2 / 2	0	0	2	0	0	Yes
06-max_abs-1.c	13	11 / 13	0	0	9	2	2	No
06-max_abs-2.c	13	12 / 13	0	0	11	1	1	No
06-max_abs-3.c	13	13 / 13	0	0	11	2	0	No
07-reset_array-0.c	1	1 / 2	0	1	0	0	1	Yes
07-reset_array-1.c	11	13 / 13	1	1	8	3	0	No
08-binary_search-1.c	18	18 / 20	1	1	11	5	2	No

CVC4 Prover Output Summary

C File	Goals	Proved	Qed	Timeout	Term.	Unreach.	CVC4	Assigns Missing
01-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
01-abs-1.c	1	3 / 3	1	1	1	0	0	Yes
01-abs-2.c	3	5 / 5	1	1	3	0	0	No
01-abs-3.c	4	6 / 6	1	1	4	0	0	No
02-max-0.c	2	4 / 4	1	1	2	0	0	Yes
02-max-1.c	5	5 / 7	1	1	3	0	2	Yes
02-max-2.c	1	3 / 3	1	1	0	1	0	Yes
02-max-3.c	6	7 / 8	1	1	4	1	1	Yes
02-max-4.c	8	10 / 10	1	1	7	1	0	Yes
03-max_ptr-0.c	0	2 / 2	1	1	0	0	0	Yes
03-max_ptr-1.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-2.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-3.c	2	4 / 4	1	1	1	1	0	Yes
03-max_ptr-4.c	4	6 / 6	1	1	4	0	0	No
04-incr_a_by_b-0.c	0	2 / 2	1	1	0	0	0	Yes
04-incr_a_by_b-1.c	2	4 / 4	1	1	1	1	0	No
04-incr_a_by_b-fail.c	2	3 / 4	1	1	1	0	1	No
04-swap-0.c	2	4 / 4	1	1	2	0	0	Yes
04-swap-1.c	8	10 / 10	1	1	7	1	0	Yes
05-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
05-abs-1.c	6	8 / 8	1	1	6	0	0	No
05-abs-2.c	5	7 / 7	1	1	5	0	0	No
06-max_abs-0.c	2	2 / 2	0	0	2	0	0	Yes
06-max_abs-1.c	13	11 / 13	0	0	9	2	2	No
06-max_abs-2.c	13	12 / 13	0	0	11	1	1	No
06-max_abs-3.c	13	13 / 13	0	0	11	2	0	No
07-reset_array-0.c	1	1 / 2	0	1	0	0	1	Yes
07-reset_array-1.c	11	13 / 13	1	1	8	3	0	No
08-binary_search-1.c	18	16 / 20	1	1	11	3	4	No

CVC5 Prover Output Summary

C File	Goals	Proved	Qed	Timeout	Term.	Unreach.	CVC5	Assigns Missing
01-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
01-abs-1.c	1	3 / 3	1	1	1	0	0	Yes
01-abs-2.c	3	5 / 5	1	1	3	0	0	No
01-abs-3.c	4	6 / 6	1	1	4	0	0	No
02-max-0.c	2	4 / 4	1	1	2	0	0	Yes
02-max-1.c	5	5 / 7	1	1	3	0	2	Yes
02-max-2.c	1	3 / 3	1	1	0	1	0	Yes
02-max-3.c	6	7 / 8	1	1	4	1	1	Yes
02-max-4.c	8	10 / 10	1	1	7	1	0	Yes
03-max_ptr-0.c	0	2 / 2	1	1	0	0	0	Yes
03-max_ptr-1.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-2.c	2	4 / 4	1	1	2	0	0	Yes
03-max_ptr-3.c	2	4 / 4	1	1	1	1	0	Yes
03-max_ptr-4.c	4	6 / 6	1	1	4	0	0	No
04-incr_a_by_b-0.c	0	2 / 2	1	1	0	0	0	Yes
04-incr_a_by_b-1.c	2	4 / 4	1	1	1	1	0	No
04-incr_a_by_b-fail.c	2	3 / 4	1	1	1	0	1	No
04-swap-0.c	2	4 / 4	1	1	2	0	0	Yes
04-swap-1.c	8	10 / 10	1	1	7	1	0	Yes
05-abs-0.c	0	2 / 2	1	1	0	0	0	Yes
05-abs-1.c	6	8 / 8	1	1	6	0	0	No
05-abs-2.c	5	7 / 7	1	1	5	0	0	No
06-max_abs-0.c	2	2 / 2	0	0	2	0	0	Yes
06-max_abs-1.c	13	11 / 13	0	0	9	2	2	No
06-max_abs-2.c	13	12 / 13	0	0	11	1	1	No
06-max_abs-3.c	13	13 / 13	0	0	11	2	0	No
07-reset_array-0.c	1	1 / 2	0	1	0	0	1	Yes
07-reset_array-1.c	11	13 / 13	1	1	8	3	0	No
08-binary_search-1.c	18	16 / 20	1	1	11	3	4	No

File Name	Alt-ergo Time(s)	Z3 Time(s)	CVC4 Time(s)	CVC5 Time(s)
01-abs-0.c	0.01	0.02	0.02	0.01
01-abs-1.c	0.02	0.04	0.02	0.001
01-abs-2.c	0.05	0.06	0.05	0.003
01-abs-3.c	0.04	0.03	0.03	0.004
02-max-0.c	0.02	0.02	0.01	0.002
02-max-1.c	0.07	0.06	0.05	0.004
02-max-2.c	0.08	0.07	0.05	0.002
02-max-3.c	0.12	0.14	0.13	0.004
02-max-4.c	0.05	0.06	0.05	0.007
03-max_ptr-0.c	0.02	0.03	0.02	0.001
03-max_ptr-1.c	0.03	0.04	0.03	0.002
03-max_ptr-2.c	0.06	0.06	0.06	0.002
03-max_ptr-3.c	0.09	0.09	0.07	0.003
03-max_ptr-4.c	0.07	0.07	0.08	0.004
04-incr_a_by_b-0.c	0.03	0.04	0.04	0.002
04-incr_a_by_b-1.c	0.02	0.03	0.01	0.003
04-incr_a_by_b-fail.c	0.03	0.04	0.04	0.002
04-swap-0.c	0.01	0.02	0.02	0.002
04-swap-1.c	0.04	0.05	0.03	0.004
05-abs-0.c	0.05	0.07	0.06	0.004
05-abs-1.c	0.07	0.08	0.07	0.006
05-abs-2.c	0.09	0.10	0.09	0.005
06-max_abs-0.c	0.03	0.04	0.03	0.002
06-max_abs-1.c	0.11	0.12	0.11	0.009
06-max_abs-2.c	0.14	0.15	0.14	0.011
06-max_abs-3.c	0.13	0.14	0.13	0.011
07-reset_array-0.c	0.02	0.03	0.02	0.002
07-reset_array-1.c	0.08	0.10	0.09	0.008
08-binary_search-1.c	0.25	0.28	0.30	0.064

Table 5: Execution times of Alt-Ergo, Z3, CVC4 and CVC5 on C files