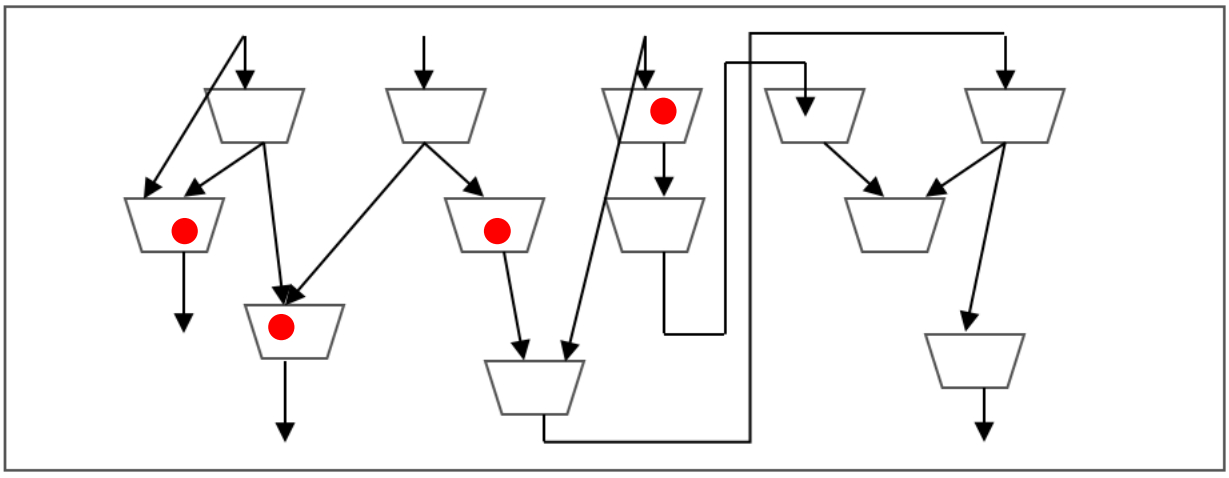
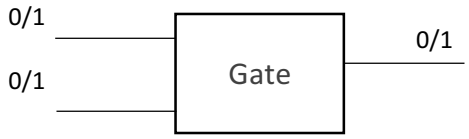
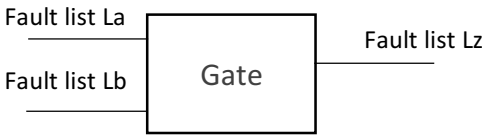
XIAN WU 903142009

6140 PROJECT 2



red dots means stuck_gates, where fault list of the output node is still unknown.

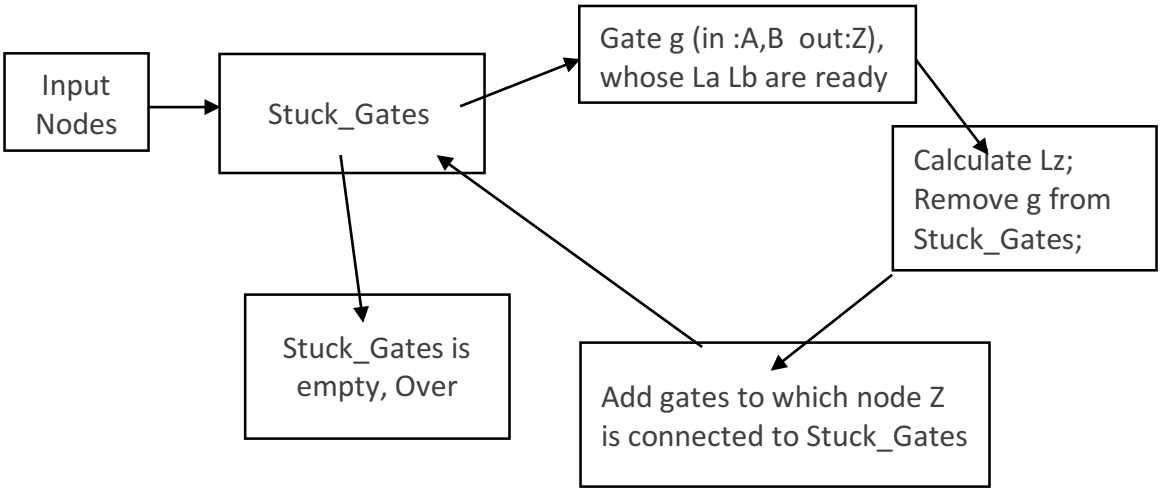




if $(C = \phi)$ then $L_Z = \{\bigcup_{j \in I} L_j\} \bigcup \{Z/(c \oplus i)\};$

else $L_Z = (\{\bigcap_{j \in C} L_j\} - \{\bigcup_{j \in I-C} L_j\}) \bigcup \{Z/(\bar{c} \oplus i)\}$

In project1, we've managed to calculate the value of each node. In detective fault simulation, the only difference is that each input and the output of each gate becomes a fault list (the rule for calculation of Lz is as above). Thus, by adapting the breadth-first-search algorithm of project1, we can figure out the implementation of this task.



std::set can be used as the data structure of fault list, so that there is no duplicate.

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Results

- part(a) result:

S27

Node ID	Stuck-at	Node ID	Stuck-at
1	0	9	1
3	0	11	1
5	0	12	0
7	0	13	0

S298f_2

Node ID	Stuck at	Node ID	Stuck at	Node ID	Stuck at	Node ID	Stuck at
3	0	28	0	57	1	120	1
5	0	29	1	58	0	122	0
6	1	30	1	64	1	132	0
7	0	31	1	66	0	133	0
8	1	32	0	67	1	135	0
9	0	33	0	68	1	138	0
10	1	34	0	95	0	141	0
11	0	35	1	102	0	142	0
12	1	36	1	103	1	143	0
15	0	37	1	105	1	145	0
18	1	39	1	106	1	146	0
19	1	41	1	107	1	163	1
20	1	45	1	108	1	164	1
21	1	48	0	109	1	166	0
22	1	49	0	110	1	168	0
23	1	51	1	115	1	169	1
24	0	52	1	116	0	170	1
25	1	53	1	117	0	173	0
26	0	54	0	118	1	182	1
27	1	56	1	119	1	183	1
						186	1
						188	0

S344f_2

NID	s-a-t	NID	s-a-t	NID	s-a-t	NID	s-a-t
1	0	34	1	60	0	106	0
2	1	35	0	61	1	108	0

3	0	36	1	62	1	109	1
4	1	37	0	64	0	110	1
5	0	38	1	65	1	111	1
6	1	39	0	66	1	112	0
7	0	40	1	67	0	114	0
8	1	41	0	68	1	115	1
9	0	42	1	69	0	116	1
10	1	43	0	70	1	129	1
11	0	44	1	71	1	130	1
12	1	45	0	72	1	137	0
13	0	46	1	73	1	139	0
14	1	47	0	76	1	141	1
15	0	48	0	77	1	142	1
16	1	49	1	78	1	144	0
25	0	50	0	91	0	146	0
26	1	51	1	92	1	176	0
27	0	52	0	95	1	177	0
28	1	53	0	96	1	179	1
29	0	54	0	97	0	180	1
30	1	55	1	99	1	181	0
31	0	56	0	100	1	183	0
32	1	57	1	101	0	188	1
33	0	58	0	105	1	189	1
						190	1

S349f_2

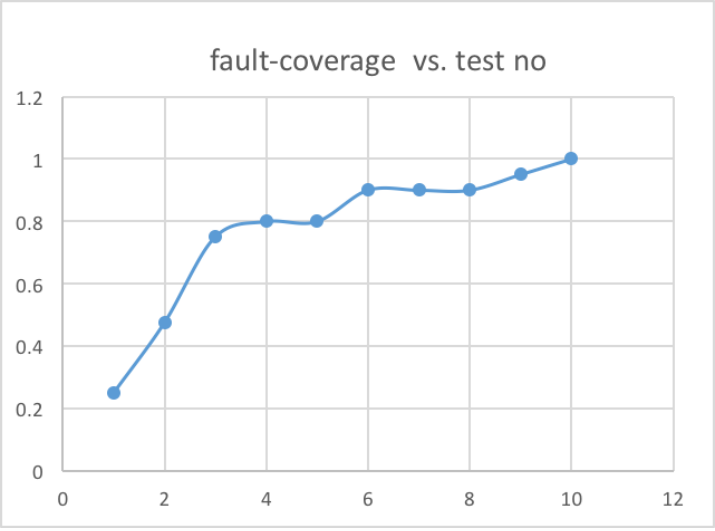
nid	s-a-t	nid	s-a-t	nid	s-a-t	nid	s-a-t
1	0	34	1	60	1	123	1
2	1	35	0	61	1	124	1
3	0	36	1	62	0	126	0
4	1	37	0	64	1	127	0
5	0	38	1	65	1	128	1
6	1	39	0	66	0	129	1
7	0	40	1	67	1	130	1
8	1	41	0	68	0	131	1
9	0	42	0	69	1	133	0
10	1	43	1	70	1	134	1
11	0	44	0	71	1	135	1
12	1	45	1	72	1	137	0

13	0	46	0	73	1	138	1
14	1	47	1	74	1	171	0
15	0	48	0	109	0	173	0
16	1	49	1	110	1	174	1
25	0	50	0	111	1	176	0
26	1	51	1	113	0	177	1
27	0	52	0	114	1	178	1
28	1	53	1	115	1	179	0
29	0	54	1	116	1	180	0
30	1	55	0	118	1	181	0
31	0	56	1	120	0	183	0
32	1	57	0	121	0	187	1
33	0	58	0	122	1	188	1
						189	1

- part(b) result:

S27

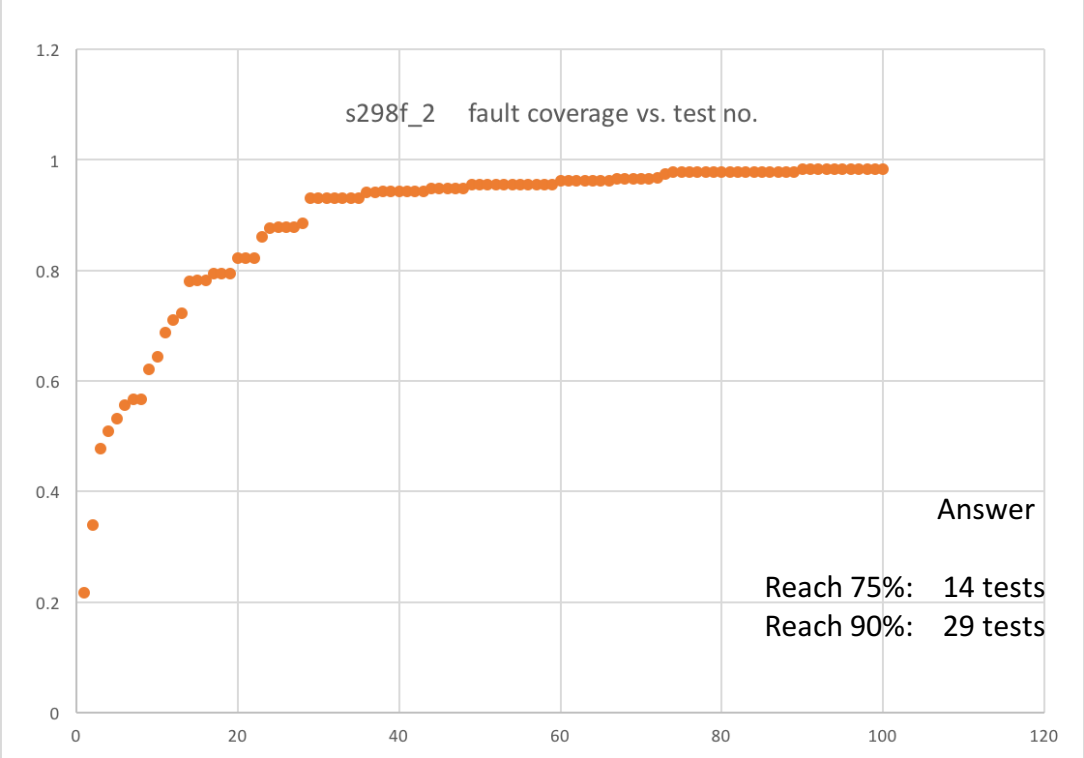
test 0 1100110
fault counts: 10 coverage: 0.25
test 1 0110001
fault counts: 19 coverage: 0.475
test 2 1001010
fault counts: 30 coverage: 0.75
test 3 1010000
fault counts: 32 coverage: 0.8
test 4 1111111
fault counts: 32 coverage: 0.8
test 5 0110011
fault counts: 36 coverage: 0.9
test 6 1111110
fault counts: 36 coverage: 0.9
test 7 0001000
fault counts: 36 coverage: 0.9
test 8 0000111
fault counts: 38 coverage: 0.95
test 9 1011011
fault counts: 40 coverage: 1



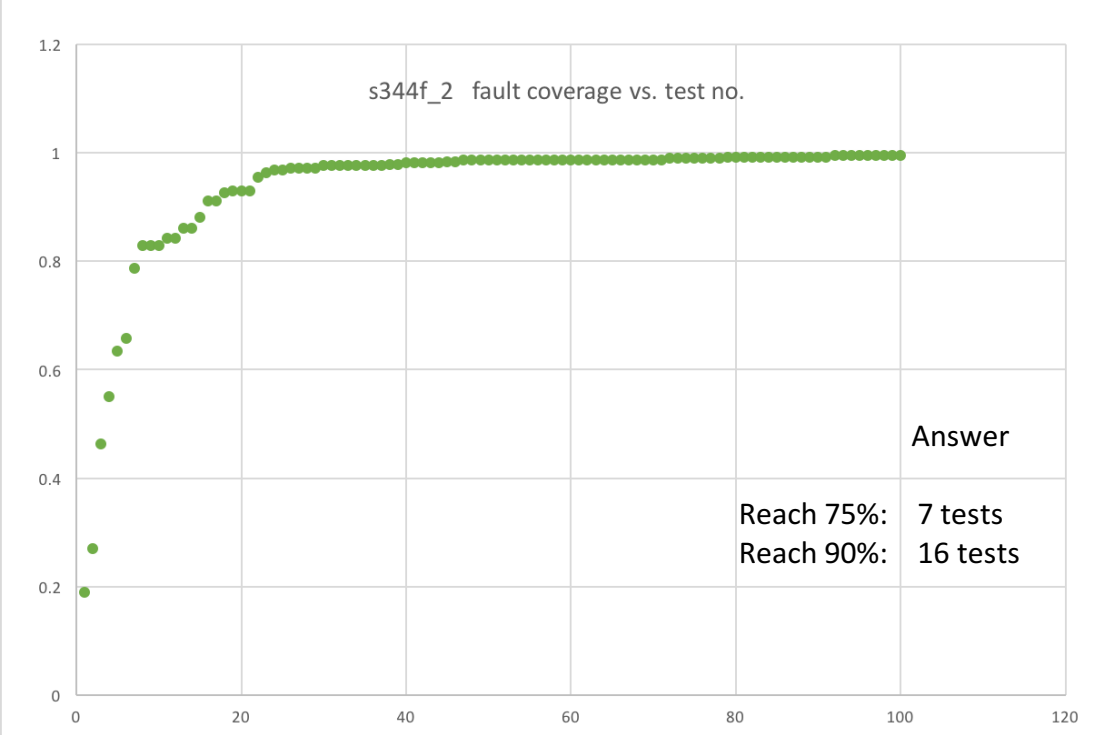
Answer

Reach 75%: 3 tests
Reach 90%: 6 tests

S298f_2



S344f_2



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