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1 test suite size:

coverage	Priorization	Tca	Totinfo	Schedule	Schedule2	Printtokens	Printtokens2	replace
Statement	Random	5	5	6	16	15	8	21
	Total	12	9	9	15	6	18	29
	additional	13	10	10	18	5	18	24
branch	Random	4	5	3	6	17	4	12
	Total	13	5	8	7	7	6	21
	additional	13	5	8	8	6	6	21
combined	Random	4	5	3	5	13	4	9
	Total	11	5	3	6	8	4	11
	additional	11	5	7	6	6	4	12

Under each program's directory:

The general information are stored in **output.txt**

The detailed test suites are stored in 9 .txt files respectively.

These files are:

output_rand_state.txt; output_rand_branch.txt; output_rand_combined.txt

output_total_state.txt; output_total_branch.txt; output_total_combined.txt

output_add_state.txt; output_add_branch.txt; output_add_combined.txt

unreachable statements/branches/combined

	Priorization	Tca	Totinfo	Schedule	Schedule2	Printtokens	Printtokens2	replace
Unreach-ables	Random	1	6	2	1	8	0	10
	Total	5	9	3	5	7	3	11
	additional	6	15	5	6	15	3	21

The generated test suits are able to cover all the reachable statements/braches/combined

2 fault exposure

Under each program's directory:

The fault exposure information are stored in **results.txt**

General faults exposure information:

coverage	Prio	Tca	Totinfo	Schedule	Schedule2	Printtokens	Printtokens2	replace
Statement	Rand	12%	52%	44%	0	71%	56%	26%

	Total	15%	70%	78%	22%	86%	67%	100%
	add	27%	39%	11%	44%	86%	44%	100%
branch	Rand	24%	48%	44%	33%	86%	56%	100%
	Total	37%	52%	56%	56%	86%	67%	100%
	add	37%	48%	56%	56%	86%	56%	100%
combined	Rand	24%	52%	33%	33%	71%	56%	100%
	Total	41%	74%	22%	22%	71%	56%	100%
	add	41%	74%	22%	22%	71%	56%	100%

Detailed faults exposure information:

Tcas (exposed faults number and the faults'version) **total faults**: 41	rand state: 5 version number: [1, 14, 18, 36, 40]	5/41 = 12%
	rand branch: 6 version number: [1, 18, 33, 36, 37, 40]	6/41 = 15%
	rand combined: 11 version number: [1, 6, 10, 11, 14, 19, 31, 33, 36, 37, 40]	11/41 = 27%
	total state: 10 version number: [1, 7, 17, 23, 28, 30, 35, 36, 38, 40]	10/41 = 24%
	total branch: 15 version number: [1, 2, 3, 14, 18, 22, 23, 28, 29, 30, 33, 35, 36, 37, 40]	15/41 = 37%
	total combined: 15 version number: [1, 2, 3, 14, 18, 22, 23, 28, 29, 30, 33, 35, 36, 37, 40]	15/41 = 37%
	add state: 10 version number: [1, 7, 17, 23, 28, 30, 35, 36, 38, 40]	10/41 = 24%
	add branch: 17 version number: [1, 2, 3, 4, 7, 17, 22, 23, 28, 29, 30, 33, 35, 36, 37, 40, 41]	17/41 = 41%
	add combined: 17 version number: [1, 2, 3, 4, 7, 17, 22, 23, 28, 29, 30, 33, 35, 36, 37, 40, 41]	17/41 = 41%

Totinfo total faults:23	rand state: 12 version number: [3, 7, 8, 9, 11, 13,	12/23 = 52%

	15, 16, 17, 18, 20, 23]	
	rand branch: 16 version number: [4, 5, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18, 19, 20, 22, 23]	16/23 = 70%
	rand combined: 9 version number: [7, 8, 11, 12, 13, 15, 16, 18, 20]	9/23 = 39%
	total state: 11 version number: [5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 20]	11/23 = 48%
	total branch: 12 version number: [5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 20]	12/23 = 52%
	total combined: 11 version number: [5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 20]	11/23 = 48%
	add state: 12 version number: [5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 20]	12/23 = 52%
	add branch: 17 version number: [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 23]	17/23 = 74%
	add combined: 17 version number: [4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 23]	17/23 = 74%

Schedule Total faults:9	rand state: 4 version number: [1, 2, 3, 9]	4/9 = 44%
	rand branch: 7 version number: [1, 2, 3, 4, 5, 7, 9]	7/9 = 78%
	rand combined: 1 version number: [1]	1/9 = 11%
	total state: 4 version number: [1, 2, 3, 9]	4/9 = 44%
	total branch: 5 version number: [1, 2, 3, 5, 9]	5/9 = 56%
	total combined: 5 version number: [1, 2, 3, 5, 9]	5/9 = 56%
	add state: 4	4/9 =44%

	version number: [1, 2, 3, 9]	
	add branch: 6 version number: [1, 2, 3, 5, 6, 9]	6/9 = 67%
	add combined: 6 version number: [1, 2, 3, 5, 6, 9]	6/9 = 67%

Schedule2 Total faults:9	rand state: 0 version number: []	0/9 = 0
	rand branch: 2 version number: [8, 9]	2/9 =22%
	rand combined: 4 version number: [2, 7, 8, 9]	4/9 = 44%
	total state: 3 version number: [1, 8, 9]	3/9 = 33%
	total branch: 5 version number: [2, 3, 7, 8, 9]	5/9 = 56%
	total combined: 5 version number: [2, 3, 7, 8, 9]	5/9 = 56%
	add state: 3 version number: [1, 8, 9]	3/9 = 33%
	add branch: 2 version number: [8, 9]	2/9 = 22%
	add combined: 2 version number: [8, 9]	2/9 = 22%

Printtokens Total:7	rand state: 5 version number: [1, 2, 3, 5, 6]	5/7 = 71%
	rand branch: 6 version number: [1, 2, 3, 4, 5, 6]	6/7 = 86%
	rand combined: 6 version number: [1, 2, 3, 5, 6, 7]	6/7 = 86%
	total state: 6 version number: [1, 2, 3, 4, 5, 6]	6/7 = 86%
	total branch: 6 version number: [1, 2, 3, 4, 5, 6]	6/7 = 86%
	total combined: 6 version number: [1, 2, 3, 4, 5, 6]	6/7 = 86%
	add state: 5	5/7 = 71%

	version number: [1, 2, 3, 5, 6]	
	add branch: 5 version number: [1, 2, 3, 5, 6]	5/7 = 71%
	add combined: 5 version number: [1, 2, 3, 5, 6]	5/7 = 71%

Printtokens2 Total: 9	rand state: 5 version number: [1, 4, 5, 6, 8]	5/9 = 56%
	rand branch: 6 version number: [1, 4, 5, 6, 7, 8]	6/9 = 67%
	rand combined: 4 version number: [1, 5, 6, 8]	4/9 =44%
	total state: 5 version number: [1, 4, 5, 6, 8]	5/9 = 56%
	total branch: 6 version number: [1, 4, 5, 6, 8, 9]	6/9 = 67%
	total combined: 5 version number: [1, 4, 5, 6, 8]	5/9 = 56%
	add state: 5 version number: [1, 4, 5, 6, 8]	5/9 = 56%
	add branch: 5 version number: [1, 4, 5, 6, 7]	5/9 = 56%
	add combined: 5 version number: [1, 4, 5, 6, 7]	5/9 = 56%

Replace Total: 31	rand state: 8	8/31 = 26%
	rand branch: 31	100%
	rand combined: 31	100%
	total state: 31	100%
	total branch: 31	100%
	total combined: 31	100%
	add state: 31	100%
	add branch: 31	100%
	add combined: 31	100%

3 Observation and Conclusion

1. Compared with test cases, the size of our generated test suites are very small

2. Combined criteria generates smallest test suite
3. Random Prioritization's ability to reveal faults are not stable, esp. when under statement coverage criteria. However it usually gives nice fault exposure rate.
4. Total and Additional Prioritization's performance are similar, and more stable than random prioritization
5. The performance for coverage criteria, from best to worst, is: combined > branch coverage > statement coverage
6. It is very unlikely to expose all the faults, no matter which coverage criteria or prioritization is used.
7. Combining two coverage criteria has some affect on the performance, however the results are unclear: in some cases it will reveal more faults, in some cases it won't