109-2 VLSI Testing PA1 Report

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1 What I've done in this PA

In this PA, I have:

- trace the source code
- fill up the holes in *sim.cpp* and $faultsim.cpp$
- run *golden_atpg* to validate my answers
- run several cases to fill up the table below.

1.1 Problems I tackled

I faced *Segmentation Fault* while trying to update $simulated\_fault\_list$ in the $fault\_sim\_a\_vector$ function in $faultsim.cpp$. I found a lot of null pointers and strange $fptr$s in $simulated\_fault\_list$. After printing out $simulated\_fault\_list$ and num_of_fault, I revised my code by iterating with num_of_fault instead of $num\_of\_faults\_in\_parallel$.

1.2 My discoveries

Observing the table below, we see that $C1355$ has a relatively low fault coverage with 63 test vectors, while $C6288$ yields the best fault coverage with only 42 test vectors, despite of the larger circuit size. Therefore, it is important to choose a good set of test vectors if we want better fault coverage.

2 The Table

circuit number	number of test vector	number of gates	number of total faults	number of detected faults	number of undetected faults	fault coverage
C499	66	554	2390	2263	127	94.69%
C1355	63	554	2726	1702	1024	62.44%
C6288	42	4800	17376	17109	267	98.46%
C7552	289	5679	19456	19144	312	98.40%