

REPORT: PODEM

ECE 6140: Digital System Testing

Topic: PODEM Algorithm for Test Generation

Data Structures for circuit and test generation

1. Custom data-type for logic value (logicValue) holds One (1), Zero(0), D(1/0), DBar(0/1), X (unknown)
2. Custom data-type for gate logic (gateLogic) holds and_l, or_l, nand_l, nor_l, xor_l, xnor_l, not_l, buf_l, none_l
3. Node: class to hold the details of a node in the circuit
 - a. Files: Node.h and Node.cpp
 - b. Data values:
 - i. name: Holds the node name as per netlist
 - ii. value: Holds the logic value of type logicValue, initialized to X
 - iii. is_stuck_at_0: if the node is stuck at 0
 - iv. is_stuck_at_1: if the node is stuck at 1
 - c. Functions:
 - i. set_fault_value: Compared the fault free value propagated to the node to the faults on the node to decide whether it needs to be D or DBar.
 - d. Support functions:
 - i. get_not_value: To generate the inverted value for logicValue type
4. Gate: class to hold the details of a gate in the circuit
 - a. Files: Gate.h and Gate.cpp
 - b. Data values:
 - i. input1: Pointer to node object for input1
 - ii. input2: Pointer to node object for input2 if the gate has 2 inputs
 - iii. output: Pointer to node object for output
 - iv. logic: Logic value for the gate of type gateLogic
 - c. Functions:
 - i. set_gate_logic: To set the logic type of the gate
 - ii. get_gate_logic: To get the gate logic type
 - iii. simulate: To simulate the circuit considering the custom logic type. It also handles logic values of type D, DBar and X.
 - iv. is_single_input: Whether the gate is a single input gate
 - v. get_controlling_value: To get the controlling value of gate based on gate type
 - vi. get_inversion_parity: To get the inversion parity of gate based on gate type
5. Circuit: class to hold the details of the complete circuit
 - a. Files: Circuit.h and Circuit.cpp
 - b. Data values:
 - i. node_list: List of node names
 - ii. node_map: To map the node name to the node object
 - iii. node_to_gate_map: To get the gates connected to any node
 - iv. outputnode_to_gate_map: To get the gates which generate the value of a given node. This is useful in backtrace for PODEM.
 - v. gateList: List of gate objects
 - vi. inputNodes: List of input nodes
 - vii. outputNodes: List of output nodes
 - viii. dfrontier: List of gates in the d-frontier
 - ix. faultNodeName: node name of the node stuck at fault
 - c. Functions:

- i. `read_netlist`: To read the netlist file, create objects for each gate and nodes. It initializes the node logic values to X.
- ii. `add_input`: To set a given nodes as primary input
- iii. `add_output`: To set a given nodes as primary output
- iv. `add_gate`: To add the gate to circuit data-structure
- v. `get_num_inputs`: To get the number of primary inputs
- vi. `get_num_outputs`: To get the number of primary outputs
- vii. `get_node_from_name`: To get the node objects from node name
- viii. `add_node_gate_map`: To add a node and gate to the node to gate mapping
- ix. `backtracePODEM`: backtrace function for PODEM (explained in detail later)
- x. `objectivePODEM`: objective function for PODEM (explained in detail later)
- xi. `implyPODEM`: imply function to forward imply a node value through the circuit
- xii. `update_dfrontier`: To go through the circuit and find all gates in the d-frontier
- xiii. `runPODEM`: top level function to run PODEM on the circuit
- xiv. `is_primary_input`: To check if the node is a primary input
- xv. `is_primary_output`: To check if the node is primary output
- xvi. `is_gate_output`: To check if the node is a gate output. Useful in backtrace.

Logic for backtrace in PODEM

Logic for objective in PODEM

```
backtracePODEM(node, value)
    inputLogicValue = value;
    // Back trace through gates till primary input node is reached
    while (is_gate_output(node)):
        newLogicValue = inputLogicValue;
        // Check gates for which the output is current node
        forall gates with output connected to node:
            inversionParity = get_inversion_parity();
            selectedInput = input with value of X
            newLogicValue = newLogicValue (XOR) inversionParity
            selectedInput->value = newLogicValue
    return pair(selectedInput, newLogicValue);
```

```
objectivePODEM()
    // Sensitize the fault
    if (fault node value == X):
        if (node-stuck-at 1) return pair(fault node, 0);
        else return pair(fault node, 1);
    // Check if d frontier empty -> to check in the main PODEM function
    if (this->dfrontier.size() == 0): return pair(-1, X);
    // Get a gate from D-frontier
    Gate dfrontierGate = (from D-frontier list);
    // Get the not of controlling value
    nonControllingValue = get_not_value(dfrontierGate->get_controlling_value());
    // Return the pair of uninitialized input and non controlling value
    if (input1 == X) return pair(input1, nonControllingValue);
    else return pair(input2, nonControllingValue);
```

Logic for imply

```
// Imply returns true if imply successful, false if conflict occurs in logic value
implyPODEM(node, node):
    for gates with input as node:
        node->value = nodeValue;
        // Check if forward implication leads to value conflict on node
        if (forward implication value conflicts with current value): return false;
        // Store gate current output value to check if simulating it changes output
        // then stop forward implication in current path
        oldOutputValue = gate->output->value;
        if (gate->simulate() == false): return false;
        if (gate->output->value == oldOutputValue) continue;
        // Gate successfully simulated then continue forward imply
        if (implyPODEM(gate->output->name, gate->output->value) == false):
            return false;
    return true;
```

Logic for PODEM Algorithm

```
runPODEM()
    // Check if fault propagated to any of the output nodes
    for (all output nodes):
        if (output node value = D or DBar): return true;
    // Check and update the dfrontier
    update_dfrontier();

    // Check for failure condition -> Target fault cannot be activated
    if (fault stuck at value and node value same): return false;

    // Find the objective to be achieved in this recursion of PODEM run
    pair(objectiveNode, objectiveValue) = objectivePODEM();

    // Check failure in object function due to empty d-frontier
    if (objectiveNode == -1): return false;

    // Back trace to primary input (PI), find the value to achieve objective
    pair(PI, PValue) = backtracePODEM(objectiveNode, objectiveValue);

    // Imply the primary input value achieved from backtrace to update node values
    // which can be updated through the path
    if (implyPODEM(PI, PValue) == false): return false;

    // Recursively created more objectives till test generated
    if (runPODEM() == true): return true;

    // If PODEM run failed, then try other value at PI
    implyPODEM(PI, not(PValue));

    // Attempt running PODEM again
    if (runPODEM() == false): return false;

    // If PODEM failed again, revert value back to X
    implyPODEM(backtrace.first, X);

    return false;
```

Logic for complete test generation:

1. Run Type 1: Single stuck at fault in single netlist file:
 - a. Circuit data structures are initialized based on the netlist file provided.
 - b. The fault is applied on the circuit as per input.
 - c. PODEM recursive run is initiated as per algorithm mentioned above.
 - d. If PODEM run returns false, then it prints that fault was undetectable.
 - e. If PODEM run is successful, then it prints the test vector generated.
2. Run Type 2:
 - a. It takes a netlist directory as input and expects s27.txt, s298f_2.txt, s344f_2.txt and s349f_2.txt to be present.
 - b. For each netlist file, it applies both s-a-0 and s-a-1 on each node in the circuit and generates the test vectors and prints them using steps a to e mentioned in Run Type 1.

Simulation results (testing screenshots for each vector: [section](#))

Netlist file	Fault Applied	Test Vector Generated	Applied vector to DFS
s27.txt	16-s-a-0	X0X10X0	0001000
	10-s-a-1	X00XXX0	0000000
	12-s-a-0	1XXX1XX	1000100
	18-s-a-1	11X101X	1101010
	17-s-a-1	10X00X0	1000000
	13-s-a-0	1XXX1XX	1000100
	6-s-a-1	X0X10X0	0001000
	11-s-a-0	X10XXXX	0100000
s298f_2.txt	70-s-a-1	01X1XXXXXXXXXX0XX	010100000000000000
	73-s-a-0	111XXXXXXXXXXXX0XX	111000000000000000
	26-s-a-1	XX1X1XX0XXXXXXXXXX	001010000000000000
	92-s-a-0	X10101XXXXXXXX0X0XX	010101000000000000
	38-s-a-0	01X0XXXXXXXXXXXX0XX	010000000000000000
	46-s-a-1	X1010XXXXXXXX0X0XX	010100000000000000
	3-s-a-1	X10010XX0XXXXXXXXXX	010010000000000000
	68-s-a-0	X1XX1XXXXXXXXX00XX	010010000000000000
s344f_2.txt	166-s-a-0	01X00XXXXX011XX0XXXXXXXXXX	010000000001100000000000
	71-s-a-1	10XXXXXXXXXXXXXXXXXXXXXX	1000000000000000000000
	16-s-a-0	10XXXXXXXXXXXXXXXXXXXXXX	100000000000000100000000
	91-s-a-1	111XXXXXXXXXXXXXXXXXXXXXX	1110000000000000000000
	38-s-a-0	X1XXXXXXXXXXXX1XXXXXXXXXX	0100000000001000000000
	5-s-a-1	XXXX0XXXXXXXXXXXXXXXXXXXX	0000000000000000000000
	138-s-a-0	01XX00XXXX0X11X0XXXXXXXXXX	010000000000110000000000
	91-s-a-0	10XXXXXXXXXXXXXXXXXXXXXX	1000000000000000000000
s349f_2.txt	25-s-a-1	XXXXXXXXXXXXXXXXXXXX1XXXXXX	000000000000000100000000
	51-s-a-0	00XXXXXXXXXXXXX0XXXXXXXXXX	0000000000000000000000
	105-s-a-1	01X01XXXXX010XX0XXXXXXXXXX	010010000001000000000000
	105-s-a-0	01X0XXXXXX1XXXX0XXXXXXXXXX	010000000001000000000000
	83-s-a-1	01XX000XXX0X0X10XXXXXXXXXX	010000000000001000000000
	92-s-a-0	01X0001XXX0001X0XXXXXXXXXX	010000100000010000000000
	7-s-a-0	XXXXXX1XXXXXXXXXXXXXXXXXXXX	000000100000000000000000
	179-s-a-0	101XXXXXXXXXXXXX0XXXXXXXXXX	101000000000000000000000

Tested on

1. Windows 10 machine
2. Gatech ECE Server (unix): ece-linlabsrv01.ece.gatech.edu

Testing steps:

1. Run PODEM on the netlist with given stuck-at-fault using command:

```
[vsaxena36@ece-linlabsrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 1 -v 0 1XXX1XX
```

2. Get the test vector printed if the fault is detectable. If the fault is undetectable, it prints:

```
[vsaxena36@ece-linlabsrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 179 -v 1  
No test vector generated. Fault is undetectable
```

3. To verify the test vector, run deductive fault simulator. Replace the “X” with either “0” or “1” before running.

4. To run deductive fault simulation on a specific fault and test vector, update a fault list file.

For example, I created a file named “faultList.txt” with file format: “<net no.> <fault value>”.

```
[vsaxena36@ece-linlabsrv01 ECE6140]$ more faultList.txt  
1 0
```

5. Run deductive fault simulator on using the test vector and fault list file.

```
[vsaxena36@ece-linlabsrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 1000100 -p faultList.txt  
Output Vector is 1001  
Faults detected:  
1 stuck at 0  
  
Coverage Statistics:  
Total nodes in circuit:20  
Total faults in circuit:1  
Total faults detected: 1  
Coverage percentage:100%
```

6. The result clearly shows that the 1-s-a-0 fault is detected using the test vector. (NOTE: We replace “X” with “0” for this example)

APPENDIX

User Manual: Deductive Fault Simulator:

IMPORTANT NOTE: When running tests on the test generated from PODEM, replace the “X” value with either 0 or 1 before running deductive FS.

Code details:

1. Language: C++ (to be preferably compiled with c++11)
2. Source code structure:
 - a. Folder Name: Deductive_FS
 - b. Source Files: DST_project2.cpp, Circuit.cpp, Gate.cpp, Node.cpp
 - c. Header Files: Circuit.h, Gate.h, Node.h, HelperFuncs.h
3. Executables: DSTProject2.out (compiled on ece-linlabsrv01.ece.gatech.edu)

```
[vsaxena36@ece-linlabssrv01 Deductive_FS]$ pwd
/nethome/vsaxena36/ECE6140/FinalProject/Deductive_FS
[vsaxena36@ece-linlabssrv01 Deductive_FS]$ ls -ltr
total 308
-rw-r--r-- 1 vsaxena36 2626-ece 13876 Nov 17 02:27 Circuit.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 4574 Nov 17 02:27 Circuit.h
-rwxr-xr-x 1 vsaxena36 2626-ece 225400 Nov 17 02:27 DSTProject2
-rw-r--r-- 1 vsaxena36 2626-ece 10338 Nov 17 02:27 DST_project2.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 11611 Nov 17 02:27 Gate.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 4021 Nov 17 02:27 Gate.h
-rw-r--r-- 1 vsaxena36 2626-ece 4910 Nov 17 02:27 HelperFuncs.h
-rw-r--r-- 1 vsaxena36 2626-ece 3401 Nov 17 02:27 Node.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 2590 Nov 17 02:27 Node.h
-rw-r--r-- 1 vsaxena36 2626-ece 4350 Nov 17 02:27 test_data.csv
-rw-r--r-- 1 vsaxena36 2626-ece 24 Nov 17 02:27 test_faults.txt
-rw-r--r-- 1 vsaxena36 2626-ece 257 Nov 17 02:27 test.txt
```

Compilation details:

1. Compile all the *.cpp and *.h files. Run either of the below commands.
 - a. Command: `g++ -std=c++11 *.cpp -o DSTProject2.out`
 - b. Command: `g++ -std=c++11 DST_project2.cpp Circuit.cpp Gate.cpp Node.cpp -o DSTProject2.out`

```
[vsaxena36@ece-linlabssrv01 Deductive_FS]$ g++ -std=c++11 *.cpp -o DSTProject2
```

Run details:

1. Input arguments:
 - a. -a: To run all possible tests from the netlist directory (s27.txt, s298f_2.txt, s344f_2.txt, s349f_2.txt)
 - b. -f <path to netlist file>: Path for single netlist to run (cannot be used with -a)
 - c. -d <path to netlist directory>: Path for all 4 netlists (must be used with -a)
 - d. -l: To run the circuit with all faults activated (cannot be used with -a)
 - e. -p <path to fault list>: Path to input fault list (cannot be used with -a and -l)
 - f. -t <test vector to apply>: Test vector to apply (cannot be used -a)

```
[vsaxena36@ece-linlabssrv01 Deductive_FS]$ ./DSTProject2 -h
Usage:
-a      ->To run all possible tests from the netlist directory (s27.txt, s298f_2.txt, s344f_2.txt, s349f_2.txt)
-f <path to netlist file> ->Path for single netlist to run (cannot be used with -a)
-d <path to netlist directory> ->Path for all 4 netlists (must be used with -a)
-l      ->To run the circuit with all faults activated (cannot be used with -a)
-p <path to fault list> ->Path to input fault list (cannot be used with -a and -l)
-t <test vector to apply> ->Test vector to apply (cannot be used -a)
Example Usage:
To run all tests for coverage stats: <exe> -a -d <path_to_netlist_dir>
To run single netlist with all faults: <exe> -f <path_to_netlist> -t <test_vector> -l
To run single netlist with custom faults: <exe> -f <path_to_netlist> -t <test_vector> -p <path_to_fault_list>
```

2. Run command: `<exe> -f <path_to_netlist> -t <input_vector> -p <path_to_fault_list>`
3. Fault list format (each in a new line):
 - a. <net no.> <stuck-at-value>
4. Example commands
 - a. To run all tests for coverage stats: `<exe> -a -d <path_to_netlist_dir>`
 - b. To run single netlist with all faults: `<exe> -f <path_to_netlist> -t <test_vector> -l`
 - c. To run single netlist with custom faults: `<exe> -f <path_to_netlist> -t <test_vector> -p <path_to_fault_list>`
5. Outputs:
 - a. For all netlists run for coverage stats (point 4.a above):
 - i. "test_data.csv" in the run directory contains test vectors run and the fault coverage percentage for each circuit.

- ii. The same data is output in the standard output.
 - b. For run on a single netlist (point 4.b and 4.c above):
 - i. Output vector is printed.
 - ii. List of detectable faults at the output are printed.
 - iii. Fault coverage statistics of the run are printed.
6. Run samples:
- 1. Run point 4.a above:

```
[vsaxena36@ece-linlabsrv01 Deductive_FS]$ ./DSTProject2 -a -d ../../netlist_files/
Running on netlist: ../../netlist_files/s27.txt
Test vectors run      Fault Coverage %
0          37.5
1          37.5
2          57.5
3          85
```

- 2. Run point 4.b above:

```
[vsaxena36@ece-linlabsrv01 Deductive_FS]$ ./DSTProject2 -f ../../netlist_files/s27.txt -t 1100100 -l
Output Vector is 1011
Faults detected:
1 stuck at 0
2 stuck at 0
3 stuck at 1
5 stuck at 0
7 stuck at 0
9 stuck at 1
11 stuck at 0
12 stuck at 0
13 stuck at 0
15 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:40
Total faults detected: 10
Coverage percentage:25%
```

- 3. Run point 4.c above:

```
[vsaxena36@ece-linlabsrv01 Deductive_FS]$ more ../../project2/test_faults.txt
1 0
3 0
5 1
6 1
7 1
9 1
[vsaxena36@ece-linlabsrv01 Deductive_FS]$ ./DSTProject2 -f ../../netlist_files/s27.txt -t 1100100 -p ../../project2/test_faults.txt
Output Vector is 1011
Faults detected:
1 stuck at 0
9 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:6
Total faults detected: 2
Coverage percentage:33.3333%
```

User Manual: PODEM:

Code details:

1. Language: C++ (to be preferably compiled with c++11)
2. Source code structure:
 - a. Folder Name: PODEM
 - b. Source Files: DST_project3.cpp, Circuit.cpp, Gate.cpp, Node.cpp
 - c. Header Files: Circuit.h, Gate.h, Node.h, HelperFuncs.h
3. Executables: DSTProject3.out (compiled on ece-linlabsrv01.ece.gatech.edu)

```
[vsaxena36@ece-linlabrv01 PODEM]$ pwd
/nethome/vsaxena36/ECE6140/FinalProject/PODEM
[vsaxena36@ece-linlabrv01 PODEM]$ ls -ltr
total 60
-rw-r--r-- 1 vsaxena36 2626-ece 7794 Nov 17 02:28 DST_project3.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 7770 Nov 17 02:28 Gate.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 1701 Nov 17 02:28 Gate.h
-rw-r--r-- 1 vsaxena36 2626-ece 3194 Nov 17 02:28 HelperFuncs.h
-rw-r--r-- 1 vsaxena36 2626-ece 1717 Nov 17 02:28 Node.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 1213 Nov 17 02:28 Node.h
-rw-r--r-- 1 vsaxena36 2626-ece 19162 Nov 17 02:28 Circuit.cpp
-rw-r--r-- 1 vsaxena36 2626-ece 4856 Nov 17 02:28 Circuit.h
```

Compilation details:

1. Compile all the *.cpp and *.h files. Run either of the below commands.
 - a. Command: `g++ -std=c++11 *.cpp -o DSTProject2.out`
 - b. Command: `g++ -std=c++11 DST_project2.cpp Circuit.cpp Gate.cpp Node.cpp -o DSTProject2.out`

```
[vsaxena36@ece-linlabrv01 PODEM]$ g++ -std=c++11 *.cpp -o DSTProject3
```

Run details:

1. Input arguments:
 - a. `-f <netlist_path>`: Path for single netlist to run
 - b. `-d <netlist_dir_path>`: Direction path for all 4 netlists
 - c. `-n <fault_node_name>`: Node name with fault
 - d. `-v <stuck_at_value>`: Stuck at value for fault

```
[vsaxena36@ece-linlabrv01 PODEM]$ ./DSTProject3 -h
Usage:
  -f <netlist_path>      ->Path to netlist file
  -d <netlist_dir_path>  ->Path to directory with known netlists(s27.txt, s298f_2.txt, s344f_2.txt, s349f_2.txt)
  -n <fault_node_name>  ->Node name with fault
  -v <stuck_at_value>   ->Stuck at value for fault
Example Usage:
  To generate tests for all faults in netlist directory: <exe> -d <netlist_dir_path>
  To generate test vector for SSF in netlist file: <exe> -f <netlist_path> -n <fault_node_name> -v <stuck_at_value>
```

2. Run command: `<exe> -f <netlist_path> -n <fault_node_name> -v <stuck_at_value>`
3. Example commands
 - a. To generate tests for all faults in netlist directory: `<exe> -d <netlist_dir_path>`
 - b. To generate test vector for SSF in netlist file: `<exe> -f <netlist_path> -n <fault_node_name> -v <stuck_at_value>`
4. Outputs:
 - a. For all netlists run (point 3.a above): Generated test vectors printed for all nodes in all 4 netlists for both stuck-at values (0 and 1)
 - b. For run on a single netlist (point 3.b above): Generated test vector printed
 - c. NOTE: If fault is undetectable, it prints: "No test vector generated. Fault is undetectable"
5. Run samples:
 - a. Run 3.a above:


```
[vsaxena36@ece-linlabserver01 PODEM]$ ./DSTProject3 -d ../../netlist_files/
Simulating Circuit: ../../netlist_files/s27.txt
Node name: 1, Stuck at value: 0 Test Vector: 1XXX1XX
Node name: 2, Stuck at value: 0 Test Vector: X10XXX0
Node name: 3, Stuck at value: 0 Test Vector: X11XXXX
Node name: 4, Stuck at value: 0 Test Vector: 10X10X0
Node name: 5, Stuck at value: 0 Test Vector: XXXX1XX
Node name: 6, Stuck at value: 0 Test Vector: X0X11X0
Node name: 7, Stuck at value: 0 Test Vector: 1XXX1XX
Node name: 8, Stuck at value: 0 Test Vector: 01X101X
```

b. Run 3.b above:

```
[vsaxena36@ece-linlabserver01 PODEM]$ ./DSTProject3 -f ../../netlist_files/s27.txt -n 10 -v 1
X00XXX0
```

Testing results for test cases in project requirements PDF:

NOTE: Replacing "X" with "0" for all tests.

1. File: s27.txt, Fault: 16-s-a-0

Generated Vector from PODEM: X0X10X0

Applied test vector in Deductive Fault Simulation: 0001000

```
[vsaxena36@ece-linlabserver01 ECE6140]$ vim faultList.txt
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 16 -v 0
X0X10X0
[vsaxena36@ece-linlabserver01 ECE6140]$ more faultList.txt
16 0
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 0001000 -p faultList.txt
Output Vector is 0100
Faults detected:
16 stuck at 0

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

2. File: s27.txt, Fault: 10-s-a-1

Generated vector from PODEM: X00XXX0

Applied test vector in Deductive Fault Simulation: 0000000

```
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 10 -v 1
X00XXX0
[vsaxena36@ece-linlabserver01 ECE6140]$ more faultList.txt
10 1
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 0000000 -p faultList.txt
Output Vector is 0001
Faults detected:
10 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

3. File s27.txt, Fault: 12-s-a-0

Generated vector from PODEM: 1XXX1XX

Applied test vector in Deductive Fault Simulation: 1000100

```
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 12 -v 0
1XXX1XX
[vsaxena36@ece-linlabserver01 ECE6140]$ more faultList.txt
12 0
[vsaxena36@ece-linlabserver01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 1000100 -p faultList.txt
Output Vector is 1001
Faults detected:
12 stuck at 0

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

4. File s27.txt, Fault: 18-s-a-1

Generated vector from PODEM: 11X101X

Applied test vector in Deductive Fault Simulation: 1101010

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 18 -v 1
11X101X
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
18 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 1101010 -p faultList.txt
Output Vector is 1011
Faults detected:
18 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

5. File s27.txt, Fault: 17-s-a-1

Generated vector from PODEM: 10X00X0

Applied test vector in Deductive Fault Simulation: 1000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 17 -v 1
10X00X0
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
17 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 1000000 -p faultList.txt
Output Vector is 1001
Faults detected:
17 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

6. File s27.txt, Fault: 13-s-a-0

Generated vector from PODEM: 1XXX1XX

Applied test vector in Deductive Fault Simulation: 1000100

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 13 -v 0
1XXX1XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
13 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 1000100 -p faultList.txt
Output Vector is 1001
Faults detected:
13 stuck at 0

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

7. File s27.txt, Fault: 6-s-a-1

Generated vector from PODEM: X0X10X0

Applied test vector in Deductive Fault Simulation: 0001000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 6 -v 1
X0X10X0
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
6 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 0001000 -p faultList.txt
Output Vector is 0100
Faults detected:
6 stuck at 1

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

8. File s27.txt, Fault: 11-s-a-0

Generated vector from PODEM: X10XXXX

Applied test vector in Deductive Fault Simulation: 0100000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s27.txt -n 11 -v 0
X10XXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
11 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s27.txt -t 0100000 -p faultList.txt
Output Vector is 0011
Faults detected:
11 stuck at 0

Coverage Statistics:
Total nodes in circuit:20
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

9. File s298f_2.txt, Fault: 70-s-a-1

Generated vector from PODEM: 01X1XXXXXXXXXX0XX

Applied test vector in Deductive Fault Simulation: 010100000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 70 -v 1
01X1XXXXXXXXXX0XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
70 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010100000000000000 -p faultList.txt
Output Vector is 11010010010000000000
Faults detected:
70 stuck at 1

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

10. File s298f_2.txt, Fault: 73-s-a-0

Generated vector from PODEM: 111XXXXXXXXXX0XX

Applied test vector in Deductive Fault Simulation: 111000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 73 -v 0
111XXXXXXXXXX0XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
73 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 111000000000000000 -p faultList.txt
Output Vector is 00010000100100000000
Faults detected:
73 stuck at 0

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

11. File s298f_2.txt, Fault: 26-s-a-1

Generated vector from PODEM: XX1X1XXX0XXXXXXXXX

Applied test vector in Deductive Fault Simulation: 001010000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 26 -v 1
XX1X1XXX0XXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
26 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 001010000000000000 -p faultList.txt
Output Vector is 10101000000000000000
Faults detected:
26 stuck at 1

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

12. File s298f_2.txt, Fault: 92-s-a-0

Generated vector from PODEM: X10101XXXXXX0X0XX

Applied test vector in Deductive Fault Simulation: 010101000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 92 -v 0
X10101XXXXXX0X0XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
92 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010101000000000000 -p faultList.txt
Output Vector is 11010010010000000000
Faults detected:
92 stuck at 0

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

13. File s298f_2.txt, Fault: 38-s-a-0

Generated vector from PODEM: 01X0XXXXXXXXXX0XX

Applied test vector in Deductive Fault Simulation: 010000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 38 -v 0
01X0XXXXXXXXXX0XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
38 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010000000000000000 -p faultList.txt
Output Vector is 11000001100000000000
Faults detected:
38 stuck at 0

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

14. File s298f_2.txt, Fault: 46-s-a-1

Generated vector from PODEM: X1010XXXXXXXXX0X0XX

Applied test vector in Deductive Fault Simulation: 010100000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 46 -v 1
X1010XXXXXXXXX0X0XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
46 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010100000000000000 -p faultList.txt
Output Vector is 11010010010000000000
Faults detected:
46 stuck at 1

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

15. File s298f_2.txt, Fault: 3-s-a-1

Generated vector from PODEM: X10010XX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010010000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 3 -v 1
X10010XX0XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
3 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010010000000000000 -p faultList.txt
Output Vector is 11001001100000000000
Faults detected:
3 stuck at 1

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

16. File s298f_2.txt, Fault: 68-s-a-0

Generated vector from PODEM: X1XX1XXXXXXXXXX00XX

Applied test vector in Deductive Fault Simulation: 010010000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s298f_2.txt -n 68 -v 0
X1XX1XXXXXXXXXX00XX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
68 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s298f_2.txt -t 010010000000000000 -p faultList.txt
Output Vector is 11001001100000000000
Faults detected:
68 stuck at 0

Coverage Statistics:
Total nodes in circuit:202
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

17. File s344f_2.txt, Fault: 166-s-a-0

Generated vector from PODEM: 01X00XXXXX011XX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010000000001100000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 166 -v 0
01X00XXXXX011XX0XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
166 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 010000000001100000000000 -p faultList.txt
Output Vector is 01100100000110011111111100
Faults detected:
166 stuck at 0

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

18. File s344f_2.txt, Fault: 71-s-a-1

Generated vector from PODEM: 10XXXXXXXXXXXXXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 1000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 71 -v 1
10XXXXXXXXXXXXXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
71 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 1000000000000000000000 -p faultList.txt
Output Vector is 10110000000000001111111100
Faults detected:
71 stuck at 1

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

19. File s344f_2.txt, Fault: 16-s-a-0

Generated vector from PODEM: 10XXXXXXXXXXXXX1XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 100000000000000100000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 16 -v 0
10XXXXXXXXXXXXX1XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
16 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 100000000000000100000000 -p faultList.txt
Output Vector is 0001111000000001111111100
Faults detected:
16 stuck at 0

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

20. File s344f_2.txt, Fault: 91-s-a-1

Generated vector from PODEM: 111XXXXXXXXXXXXXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 111000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 91 -v 1
111XXXXXXXXXXXXXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
91 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 111000000000000000000000 -p faultList.txt
Output Vector is 0001000000000001111111010
Faults detected:
91 stuck at 1

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

21. File s344f_2.txt, Fault: 38-s-a-0

Generated vector from PODEM: X1XXXXXXXXXXXXX1XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010000000000010000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 38 -v 0
X1XXXXXXXXXXXXX1XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
38 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 010000000000010000000000 -p faultList.txt
Output Vector is 011011100000010111111100
Faults detected:
38 stuck at 0

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

22. File s344f_2.txt, Fault: 5-s-a-1

Generated vector from PODEM: XXXX0XXXXXXXXXXXXXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 000000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 5 -v 1
XXXX0XXXXXXXXXXXXXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
5 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 000000000000000000000000 -p faultList.txt
Output Vector is 0010000111100001111111100
Faults detected:
5 stuck at 1

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

23. File s344f_2.txt, Fault: 138-s-a-0

Generated vector from PODEM: 01XX00XXXX0X11X0XXXXXXX

Applied test vector in Deductive Fault Simulation: 010000000000110000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 138 -v 0
01XX00XXXX0X11X0XXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
138 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 010000000000110000000000 -p faultList.txt
Output Vector is 0110101000001101111111100
Faults detected:
138 stuck at 0

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

24. File s344f_2.txt, Fault: 91-s-a-0

Generated vector from PODEM: 10XXXXXXXXXXXXXXXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 100000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s344f_2.txt -n 91 -v 0
10XXXXXXXXXXXXXXXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
91 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s344f_2.txt -t 100000000000000000000000 -p faultList.txt
Output Vector is 101100000000000011111111100
Faults detected:
91 stuck at 0

Coverage Statistics:
Total nodes in circuit:190
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

25. File s349f_2.txt, Fault: 25-s-a-1

Generated vector from PODEM: XXXXXXXXXXXXXXXX1XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 000000000000000100000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 25 -v 1
XXXXXXXXXXXXX1XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
25 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 000000000000000100000000 -p faultList.txt
Output Vector is 0001111111000001011111111
Faults detected:
25 stuck at 1

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

26. File s349f_2.txt, Fault: 51-s-a-0

Generated vector from PODEM: 00XXXXXXXXXXXXX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 000000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 51 -v 0
00XXXXXXXXXXXXX0XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
51 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 000000000000000000000000 -p faultList.txt
Output Vector is 0010000111100000101111111
Faults detected:
51 stuck at 0

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

27. File s349f_2.txt, Fault: 105-s-a-1

Generated vector from PODEM: 01X01XXXXX010XX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010010000001000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 105 -v 1
01X01XXXXX010XX0XXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
105 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 010010000001000000000000 -p faultList.txt
Output Vector is 0110110000010000101111101
Faults detected:
105 stuck at 1

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

28. File s349f_2.txt, Fault: 105-s-a-0

Generated vector from PODEM: 01X0XXXXXX1XXXX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010000000010000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 105 -v 0
01X0XXXXX1XXXX0XXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
105 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 010000000010000000000000 -p faultList.txt
Output Vector is 01110000000000000100111111
Faults detected:
105 stuck at 0

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

29. File s349f_2.txt, Fault: 83-s-a-1

Generated vector from PODEM: 01XX000XXX0X0X10XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010000000000001000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 83 -v 1
01XX000XXX0X0X10XXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
83 1
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 010000000000010000000000 -p faultList.txt
Output Vector is 01101111000000101011111111
Faults detected:
83 stuck at 1

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

30. File s349f_2.txt, Fault: 92-s-a-0

Generated vector from PODEM: 01X0001XXX0001X0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 010000100000010000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 92 -v 0
01X0001XXX0001X0XXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
92 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 010000100000010000000000 -p faultList.txt
Output Vector is 01101111000001001011110111
Faults detected:
92 stuck at 0

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

31. File s349f_2.txt, Fault: 7-s-a-0

Generated vector from PODEM: XXXXXX1XXXXXXXXXXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 000000100000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 7 -v 0
XXXXX1XXXXXXXXXXXXXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
7 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 000000100000000000000000 -p faultList.txt
Output Vector is 0010001111000001011110111
Faults detected:
7 stuck at 0

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```

32. File s349f_2.txt, Fault: 179-s-a-0

Generated vector from PODEM: 101XXXXXXXXXXXXX0XXXXXXXXXX

Applied test vector in Deductive Fault Simulation: 101000000000000000000000

```
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project3/DSTProject3 -f ./netlist_files/s349f_2.txt -n 179 -v 0
101XXXXXXXXXXXXX0XXXXXXX
[vsaxena36@ece-linlabssrv01 ECE6140]$ more faultList.txt
179 0
[vsaxena36@ece-linlabssrv01 ECE6140]$ ./project2/DSTProject2 -f ./netlist_files/s349f_2.txt -t 101000000000000000000000 -p faultList.txt
Output Vector is 10100000000000000111111111
Faults detected:
179 stuck at 0

Coverage Statistics:
Total nodes in circuit:189
Total faults in circuit:1
Total faults detected: 1
Coverage percentage:100%
```