

# User Manual: Fault Simulator and PODEM

## User Manual: Deductive fault simulator:

The program has been built using C++. The program can be run from Linux terminal.

### README:

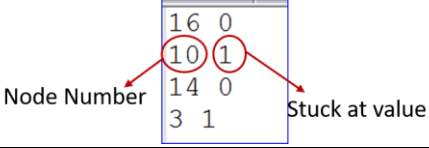
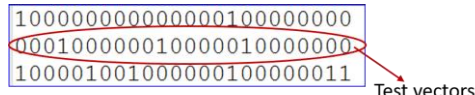
1. Unzip the file *DST\_project\_Mohammad\_Adnaan*
2. The deductive fault simulator can be run in four modes dictated by the two parameters.

mode_all_fault=1 test_vector_all=1	All stuck at 0 and stuck at 1 faults are considered and 100 random test vectors are taken as input. The detected faults for every test vector is calculated and saved in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ detected_faults.txt/</i> The fault coverage information is saved in <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ fault_coverage.txt/</i>
mode_all_fault=0 test_vector_all=1	Only the given faults in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ input_fault_list.txt/</i> are considered and 100 random test vectors are taken as input. The detected faults for every test vector is calculated and saved in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ detected_faults.txt/</i>
mode_all_fault=1 test_vector_all=0	All stuck at 0 and stuck at 1 faults are considered and test vectors given in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ input_test_vector_file.txt/</i> are taken as input. The detected faults for every test vector is calculated and saved in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ detected_faults.txt/</i> The fault coverage information is saved in <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ fault_coverage.txt/</i>
mode_all_fault=0 test_vector_all=0	Only the given faults in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ input_fault_list.txt/</i> are considered and test vectors given in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ input_test_vector_file.txt/</i> are taken as input. The detected faults for every test vector is calculated and saved in the file <i>DST_project_Mohammad_Adnaan/Deductive_FS/files/ detected_faults.txt/</i>

3. The circuit files are kept in the following folder

`DST_project_Mohammad_Adnaan/Deductive_FS/files`

4. Edit the files `input_fault_list.txt` and `input_test_vector_file.txt` kept in this folder if required.

 <p>Node Number</p> <p>Stuck at value</p>	 <p>Test vectors</p>
<b>Input fault list file format</b>	<b>Input test vector file format</b>

4. Navigate to the `src` folder of **Deductive\_FS** . All source code files are kept here.

`DST_project_Mohammad_Adnaan/Deductive_FS/src/`

5. Run command `vi deductive.cpp` and press I in the keyboard to edit the main file in order to select the circuit file and mode parameters.

6. Set the desired mode parameters and circuit file.

```
#include <iostream>
#include <string.h>
#include <stdio.h>
#include <stdlib.h>
#include <assert.h>
#include <fstream>
#include "gates.h"
#include "fault_list.h"
#include <string>
#include <vector>

char file_name[100]="../files/s349f_2.txt"; // circuit_file_name
char fault_list_file[100]="../files/input_fault_list.txt";
char input_test_vector_file[100]="../files/input_test_vector_file.txt";

int main()
{
    int mode_all_fault=1; // mode_all_fault=1 to consider all faults; mode_all_fault=0 to consider
    list test_vector_all=1; // test_vector_all=1 to consider random test vector; test_vector_all=0 to consider
    rs int i,j,k,node,value,fault_all_known=0,total_detected_faults=0;
    int number_test_vectors=100;
    Circuit_init correct_circuit;
    fault_list_init FF;
    correct_circuit.input_calc(file_name);
    int* all_detected_faults;
    FILE *fault_results;
    FILE *fault_coverage;
    char *input;
    char **input_vectors;
    char *temp_scan=(char *)malloc((total_inputs+1) * sizeof(char));
    std::vector<int> known_fault_nodes_list;
    std::vector<int> connected_fault_gates_list;
```

7. After setting the parameters press escape in keyboard, type the command `:wq` and press enter to save the changes and exit the file.

8. In the terminal run the command

`make all`

9. Run the following command to set execution permission for the program

`chmod +x deductive`

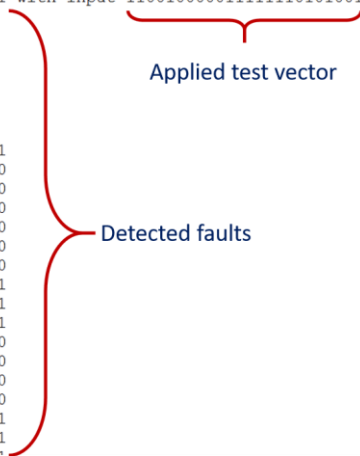
10. Finally run the following command to run the deductive simulator

`./deductive`

11. Output results are saved in the folder

`DST_project_Mohammad_Adnaan/Deductive_FS/files/`

12. The output results are saved in the files `detected_faults.txt` and `fault_coverage.txt`

<pre>../files/s344f_2.txt vector number 1 with input 110010000011111110101001 3 Stuck at 1 4 Stuck at 1 5 Stuck at 0 6 Stuck at 1 7 Stuck at 1 8 Stuck at 1 9 Stuck at 1 10 Stuck at 1 11 Stuck at 0 12 Stuck at 0 13 Stuck at 0 14 Stuck at 0 15 Stuck at 0 16 Stuck at 0 25 Stuck at 1 26 Stuck at 1 27 Stuck at 1 28 Stuck at 0 29 Stuck at 0 30 Stuck at 0 31 Stuck at 0 32 Stuck at 1 33 Stuck at 1 34 Stuck at 1</pre> 	<b>Detected tests output file format</b>
<pre>../files/s349f_2.txt number of vector 1 total faults 378 detected faults 74 fault coverage 0.196 number of vector 2 total faults 378 detected faults 161 fault coverage 0.426 number of vector 3 total faults 378 detected faults 220 fault coverage 0.582 number of vector 4 total faults 378 detected faults 233 fault coverage 0.616 number of vector 5 total faults 378 detected faults 235 fault coverage 0.622 number of vector 6 total faults 378 detected faults 240 fault coverage 0.635 number of vector 7 total faults 378 detected faults 246 fault coverage 0.651 number of vector 8 total faults 378 detected faults 251 fault coverage 0.664 number of vector 9 total faults 378 detected faults 258 fault coverage 0.683 number of vector 10 total faults 378 detected faults 258 fault coverage 0.683 number of vector 11 total faults 378 detected faults 278 fault coverage 0.735 number of vector 12 total faults 378 detected faults 280 fault coverage 0.741 number of vector 13 total faults 378 detected faults 289 fault coverage 0.765 number of vector 14 total faults 378 detected faults 307 fault coverage 0.812 number of vector 15 total faults 378 detected faults 309 fault coverage 0.817 number of vector 16 total faults 378 detected faults 315 fault coverage 0.833 number of vector 17 total faults 378 detected faults 315 fault coverage 0.833 number of vector 18 total faults 378 detected faults 315 fault coverage 0.833 number of vector 19 total faults 378 detected faults 316 fault coverage 0.836 number of vector 20 total faults 378 detected faults 316 fault coverage 0.836 number of vector 21 total faults 378 detected faults 317 fault coverage 0.839 number of vector 22 total faults 378 detected faults 317 fault coverage 0.839 number of vector 23 total faults 378 detected faults 317 fault coverage 0.839</pre>	<b>Fault coverage output file format</b>