**ANOSH DARUWALLA PROJECT 1 REPORT**

**ECE 6140 9/17/13**

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**Project 1:** Circuit logic test simulator

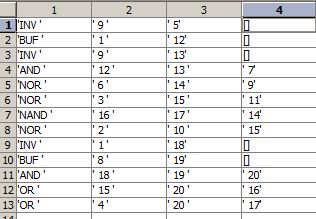
Code was written in **MATLAB**.

**Data Structures used:**

**Cells:**

Cells were used to store the text file into usable format in Matlab. Each text file was input using the **‘textread’** function and three cells viz. **data{}**, **input{}** and **output{}** were used for the circuit nodes, input nodes and output nodes respectively.

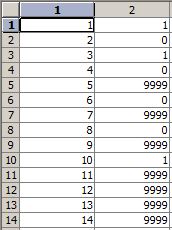
For the first circuit ‘s27.txt’, the pictures of the three cells are shown:







Another cell **Q{}** was used to store the value of each node. The value 9999 was used for each undefined node. The code was run till all nodes were defined at a value and the values of the output nodes were taken:

For the s27.txt circuit, nodes [1,2,3,4,6,8,10] are

inputs and everything else is 9999 or undefined.

(total of 20 nodes but only 14 are shown in the

picture due to size constraints)

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**Process flow/Sample code:**

%Read input text file.

**data{:,:}** %store circuit nodes

**input{:,:}** %store input nodes

**output{:,:}** %store output nodes

**Q{max value of nodes,:}=9999** %make all values of nodes undefined

**Q{input{:,1},1}=Input{:,1}**  %store input values in resp. places

%Main code

**while (number of 9999 values in Q{}) !=0** %solve till number of 9999 values is 0

**for (n=all values in Q{})**

**if (Q{n,1}==(boolean equation)) && Q{n,1}==9999**

%check if input node is undefined

**perform corresponding Boolean between inputs**

**store in Q{n,2}** %store in output column of Q

**end**

**end**

**check for number of 9999 values in Q{}**

**end**

**output{:,2}=Q{output{:,1},1}** %store output node values in cell

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**s27.txt:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Output nodes | Output 1 | Output 2 | Output 3 | Output 4 | Output 5 |
| 7 | 1 | 0 | 1 | 0 | 1 |
| 9 | 0 | 1 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 |
| 5 | 1 | 0 | 1 | 1 | 1 |

**s298f\_2.txt:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Output nodes | Output 1 | Output 2 | Output 3 | Output 4 | Output 5 |
| 18 | 0 | 0 | 0 | 0 | 1 |
| 19 | 0 | 0 | 0 | 0 | 1 |
| 20 | 0 | 0 | 0 | 0 | 1 |
| 21 | 0 | 0 | 0 | 0 | 1 |
| 22 | 0 | 0 | 0 | 0 | 1 |
| 23 | 0 | 0 | 0 | 0 | 0 |
| 24 | 1 | 0 | 0 | 0 | 1 |
| 25 | 0 | 0 | 0 | 0 | 1 |
| 26 | 1 | 0 | 0 | 1 | 1 |
| 27 | 0 | 1 | 0 | 0 | 1 |
| 28 | 1 | 1 | 1 | 0 | 0 |
| 29 | 0 | 0 | 1 | 1 | 0 |
| 30 | 0 | 0 | 1 | 0 | 0 |
| 31 | 0 | 0 | 1 | 0 | 0 |
| 32 | 1 | 0 | 0 | 1 | 1 |
| 33 | 1 | 0 | 1 | 0 | 0 |
| 34 | 1 | 1 | 0 | 0 | 1 |
| 35 | 0 | 0 | 0 | 1 | 1 |
| 36 | 0 | 0 | 1 | 0 | 0 |
| 37 | 0 | 0 | 0 | 1 | 1 |

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**s344f\_2.txt:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Output nodes | Output 1 | Output 2 | Output 3 | Output 4 | Output 5 |
| 25 | 1 | 0 | 0 | 0 | 1 |
| 26 | 0 | 0 | 0 | 0 | 0 |
| 27 | 1 | 0 | 0 | 0 | 0 |
| 28 | 0 | 1 | 1 | 0 | 1 |
| 29 | 1 | 1 | 1 | 1 | 1 |
| 30 | 0 | 1 | 1 | 1 | 1 |
| 31 | 1 | 1 | 0 | 0 | 0 |
| 32 | 0 | 0 | 0 | 1 | 1 |
| 33 | 1 | 0 | 0 | 1 | 1 |
| 34 | 0 | 0 | 0 | 1 | 1 |
| 35 | 1 | 0 | 0 | 1 | 1 |
| 36 | 0 | 0 | 1 | 0 | 0 |
| 37 | 1 | 0 | 1 | 0 | 0 |
| 38 | 0 | 0 | 1 | 1 | 0 |
| 39 | 1 | 1 | 0 | 1 | 0 |
| 40 | 0 | 0 | 1 | 1 | 0 |
| 41 | 1 | 0 | 1 | 1 | 1 |
| 42 | 0 | 0 | 0 | 1 | 0 |
| 43 | 1 | 0 | 0 | 1 | 0 |
| 44 | 0 | 1 | 0 | 1 | 1 |
| 45 | 1 | 1 | 1 | 0 | 0 |
| 46 | 0 | 1 | 1 | 0 | 0 |
| 47 | 1 | 1 | 1 | 0 | 0 |
| 48 | 1 | 1 | 0 | 0 | 1 |
| 49 | 0 | 0 | 1 | 1 | 0 |
| 50 | 1 | 0 | 0 | 0 | 0 |

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**s349f\_2.txt:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Output nodes | Output 1 | Output 2 | Output 3 | | Output 4 | | Output 5 | |
| 25 | 1 | 0 | 0 | 0 | | 1 | |
| 26 | 0 | 0 | 0 | 0 | | 0 | |
| 27 | 1 | 0 | 0 | 0 | | 0 | |
| 28 | 0 | 1 | 1 | 0 | | 1 | |
| 29 | 1 | 1 | 1 | 1 | | 1 | |
| 30 | 0 | 1 | 1 | 1 | | 1 | |
| 31 | 1 | 1 | 0 | 0 | | 0 | |
| 32 | 0 | 0 | 0 | 1 | | 1 | |
| 33 | 1 | 0 | 0 | 1 | | 1 | |
| 34 | 0 | 0 | 0 | 1 | | 1 | |
| 35 | 1 | 0 | 0 | 1 | | 1 | |
| 36 | 0 | 0 | 1 | 0 | | 0 | |
| 37 | 1 | 0 | 1 | 0 | | 0 | |
| 38 | 0 | 0 | 1 | 1 | | 0 | |
| 39 | 1 | 1 | 0 | 1 | | 0 | |
| 40 | 0 | 0 | 1 | 1 | | 0 | |
| 41 | 1 | 1 | 0 | 0 | | 1 | |
| 42 | 1 | 0 | 0 | 0 | | 0 | |
| 43 | 0 | 1 | 0 | 1 | | 1 | |
| 44 | 1 | 1 | 1 | 0 | | 0 | |
| 45 | 0 | 1 | 1 | 0 | | 0 | |
| 46 | 1 | 1 | 1 | 0 | | 0 | |
| 47 | 0 | 0 | 1 | 1 | | 0 | |
| 48 | 1 | 0 | 1 | 1 | | 1 | |
| 49 | 0 | 0 | 0 | 1 | | 0 | |
| 50 | 1 | 0 | 0 | 1 | | 0 | |