Homework 6

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Problem 1. ISCAS Benchmark Simulator and Performance Tester
The input format processor and simulator is implemented in `src/main.cpp`. The base of the processor was taken from HW5. In should be compiled using the provided `Makefile` to ensure the correct compiler configuration is used. This program makes heavy use of `C++11` features. The two provided input sets are located in `inputs/`.

The simulator is run using the command `main netlist.txt inputs.vec outfile [s/t]`. The two input filenames are the ISCAS benchmark file and a plain-text table of the value for each primary input declared in the ISCAS format. The simulation state after each input is processed is written to a file with the given name. The simulator uses either **t**able-lookup or input-**s**canning depending on the flag given.

The output file for the `inputs/s27.txt` input circuit with the `inputs/s27.vec` input vectors is as follows. In table-lookup mode, the simulation takes 0.000819224s. In input-scanning mode, the simulation takes 0.000650427s.

```
Input  :0000
State  :XXX
Output :X

Input  :0010
State  :0XX
Output :X

Input  :0100
State  :0X0
Output :X

Input  :1000
State  :0X1
Output :1

Input  :1111
State  :101
Output :1
```

The 500kB output file for the `inputs/s35932.txt` input circuit with the `inputs/s35932.vec` is not included in this document. In table-lookup mode, the simulation takes 366.31s. In input-scanning mode, the simulation takes 214.304s.

For this implementation of the two simulation techniques, it appears that the input-scanning technique is faster than the table-lookup technique.