Santa Clara University

ELEN 249 (VLSI Architectures for Communications and Signal Processing Systems)

Project Report on

Hardware Gaussian Noise generator

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Following are the timing and the area reports

1. Timing

```
****************************************
Report : timing
        -path full
        -delay max
        -max_paths 1
Design : top_module
Version: I-2013.12-SP1
Date   : Mon Mar 21 15:29:47 2016
****************************************

Operating Conditions: nom_pvt   Library: lsi_10k
Wire Load Model Mode: top

  Startpoint: valid_reg (rising edge-triggered flip-flop)
  Endpoint: valid (output port)
  Path Group: (none)
  Path Type: max

  Point                          Incr       Path
  -----------------------------------------------------------
  valid_reg/CP (FDS2)                0.00       0.00 r
  valid_reg/Q (FDS2)                 1.27       1.27 f
  valid (out)                  0.00       1.27 f
  data arrival time                       1.27
  -----------------------------------------------------------
```

2. Area

```
****************************************
Report : area
Design : top_module
Version: I-2013.12-SP1
Date   : Mon Mar 21 15:19:59 2016
****************************************

Information: Updating design information... (UID-85)
Library(s) Used:

    lsi_10k (File: /opt/synopsys-2013/app/syn/libraries/syn/lsi_10k.db)

Number of ports:                   35
Number of nets:                   819
Number of cells:                  368
Number of combinational cells:     18
Number of sequential cells:       344
Number of macros/black boxes:       0
Number of buf/inv:                  1
Number of references:              13

Combinational area:       23216.000000
Buf/Inv area:               287.000000
Noncombinational area:     6902.000000
Macro/Black Box area:         0.000000
Net Interconnect area:     undefined  (No wire load specified)

Total cell area:          30118.000000
Total area:               undefined
```

3. Output Waveform

Output waveform of the Noise generator using box muller method
It generates two 16 bit numbers after ever cycle
The values of the output X0 and X1 are in the files Outputvalues_X0.txt
And Outputvalues_X1.txt respectively.