Question: 03
DATE: October 6, 2017
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1 Background

Create a synthesizable combinatorial module that accepts a 4-bit input x and and generates a single-bit ouput y based on x and function select signal s. The selector should select which reduction operator to be applied to x in order to produce y according to the following:

- 0: and
- 1: or
- 2: xor
- 3: nand
- 4: nor

2 Implementation

The output 'y' was generated in a case block with reduction operators applied to the input 'x'.

The module implementation along with its testbench can be found in the 'scripts' directory. A sample of the waveform generated is provided:

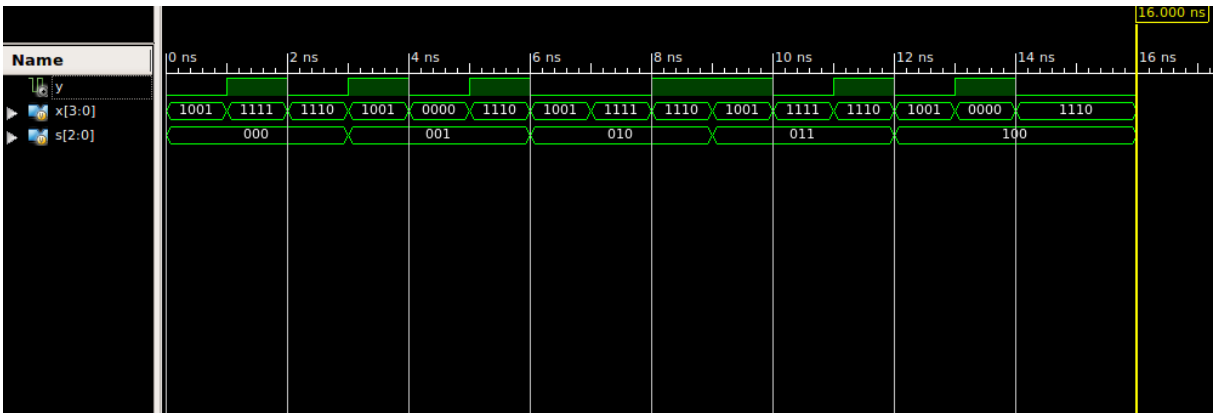

Figure 1: Waveform Generated from Part 3 Test Bench

A table of the inputs and outputs generated in the test bench is also generated:

Table 1: Inputs and Outputs of The Part 3 Test Bench

op	x	y
&	1001	0
&	1111	1
&	1110	0
|	1001	1
|	0000	0
|	1110	1
^	1001	0
^	1111	0
^	1110	1
~&	1001	1
~&	1111	0
~&	1110	1
~|	1001	0
~|	0000	1
~|	1110	0