Lab 11

Michael Lankford

Station #11 Partner: Vladislava Sicicorez

Prelab:

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Purpose:

The purpose of lab 11 was to implement a 2:1, 4:1, and 8:1 multiplexer in Xilinx Vivado with VHDL.

Lab Procedure:

We started the lab by opening Vivado and creating an RTL project that was set to ‘VHDL’ target language. We continued by creating 3 design source files called Mux, Mux4\_1, and Mux8\_1 with I/O ports for each file. The I/O for Mux was sel, a, b, and z, the I/O for for Mux4\_1 was a, b, c, d, sel, and z, and the I/O for Mux8\_1 was was sel, a, b, c, d, e, f, g, h, and z. We then wrote if-then-else statements for each to perform their respective multiplexer functions.

Next, we created a simulation file titled MultiplexerSim, copied and pasted the I/O from Mux into MultiplexerSim, created std\_logic signals for the I/O , and also added a port map to Mux. Finally, we also added test cases. We then repeated the previous steps for Mux4\_1 and Mux8\_1.

We then ran the Behavioral Simulation and took note of the waveform output.

Vivado Code-

Mux 2:1-

Graphical user interface, text, application, email

Description automatically generatedGraphical user interface, text, application

Description automatically generated

Mux 4:1-

Graphical user interface, text, application

Description automatically generatedGraphical user interface, application

Description automatically generated

Mux 8:1 –

Graphical user interface, application

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Description automatically generatedGraphical user interface, application, Word

Description automatically generated

Waveform-

Mux 2:1-

A screenshot of a computer

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Mux 4:1-

Graphical user interface, text

Description automatically generated

Mux 8:1-

Graphical user interface

Description automatically generated

Conclusion:

In this lab, we further acquainted ourselves with the Xilinx Vivado software by making 3 circuits that simulated a 2:1, 4:1, and 8:1 multiplexer. The results of this lab showed the correct outputs for each multiplexer.

Finally, I believe physically constructing a circuit is more beneficial to my learning.

Observations:

The main observation I have to improve my performance on future experiments would be to further learn the code for multiplexers.