Lab 0

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Prelab:

Diagram, schematic

Description automatically generated

Purpose:

The purpose of lab 0 it to become acquainted with the tools in the lab like Multism and to learn how to use them.

Lab Procedure:

We started the lab by using Multism to simulate our 2 circuits(1 circuit with 2 inverters and another with 3 inverters). We used the Word Generator that was set to an internal clocking frequency of 1 KHz, an initial address of 0000 and a final address of 0003, and a pattern that counts up. We also used the Logic Analyzer that was set to the same internal clock frequency as the word generator and set clocks per division to 2, then we connected the Word Generator and the Logic Analyzer with the inverters and took notes of the output.

For the second part of the experiment, we used the breadboard, a hex inverter, wires, and LEDs to make both circuits. We made a circuit by connecting power to the row that the top right of the inverter was connected to and connected ground to the row that the bottom left of the inverter was connected to. We then use the wires to make the cascaded inverters between rows and then connected the wires to the LEDs so we could see the different high and low outputs.

Multism screenshot-

A picture containing graphical user interface

Description automatically generated

Breadboard circuit-

A picture containing text

Description automatically generated

Conclusion:

In this lab, we learned how to use Multism and the breadboard by constructing 2 different circuits using inverters. Multism was used for the simulated construction of the circuits while the breadboard was used for the physical construction. The results of this lab showed that 2 cascaded inverters had a high output for a high input and a low output for a low input. For 3 cascaded inverters, it showed that the circuit had a high output for a low input and a low output for a high input. We saw this on the breadboard because a high output correlated to a turned-on LED and a low output correlated to a turned off LED.

Finally, I believe that actually constructing a circuit is more supplemental to my learning and understanding the material.

Observations:

My main observation for future improvements on labs for myself would be to become more acquainted with how the breadboard works; especially with how to fully build the circuits and to give them power and ground them correctly.