CSCE 2114-L007

Blake Fasse

September 13, 2016

[bafasse@uark.edu](mailto:bafasse@uark.edu)

The purpose of the lab was to understand how logic gates work. Using both the 7404, 7408, and 7432 IC’s, we attempted to understand how to create circuits. Using the 7404 IC simply created a basic circuit to where when you flipped the switch on the FPGA board changed the LED from low to high. Using the 7408 IC, which has AND gates in it, had to have two inputs closed in order to have to LED switch to high. The 7432 has OR gates in it and needs at least one switch that is closed in order for the LED to be high. Using both the 7404 and 7408 created a NAND gate which is the exact opposite of the AND gate in that with both switches open the LED is switched to high, when both switches are closed the LED is switched to low, and everywhere in between the LED is switched to high.

Going into this lab I had no idea what I was supposed to do because anytime we used bread boards, which was very rare, there was always that one person who hogged it all the time. With that being said, that didn’t mean I didn’t know what the input and output of the different gates.

The way the system was designed had the chip in the bottom left corner the board and a bunch of wires that routed the power, ground, and signals. In the case of the set up for the NAND gate, it used two IC instead of just one, an AND and OR gate.

The 7404 chip has one input and one output with an inverter on it so when the switch is open the LED is low and when the switch is closed the LED is high. The 7408 chip has two inputs and one output and in order for the LED to be high both switches need to be closed otherwise the LED is low. The 7432 chip uses OR gates so as long as one switch is closed the LED is high. The NAND gate, which uses both the 7404 and 7408 chips, is the exact opposite of the AND gate in that when both switches are open the LED is high and when both switches are closed the LED is low.

To reiterate, the purpose of this lab to understand how logic gates work. In hindsight I should not have placed the chip so far away from the power source because the wires were not very long so I had use a lot of them and it got confusing which wire to pull when I needed to change something.