Discussion –

1. We would design a circuit with 8 OR gates to combine the 16 discrete digital inputs into 8 in order to be used on an 8-bit input port.
2. A circuit using 8 OR gates could be used to create 16 outputs from an 8-bit microcontroller output port. Then, 2 of the outputs would have to be unused for 14 discrete digital outputs to remain.
3.
   - D0 = A1 + A3 + A5 + A7
   - D1 = A2 + A3 + A6 + A7
   - D2 = A4 + A5 + A6 + A7

Conclusion –

Once the DE2 board was plugged in and Quartus Prime was set up, we designed a 2 to 4 decoder by constructing a k-map based off a truth table. A block diagram was created, then opened in ModelSim for the 2 to 4 decoder. Then, we proceeded to remake the same 2 to 4 decoder by coding in VHDL. After compiling the code, a symbol file was created from the VHDL code that was then opened in ModelSim. We repeated everything above with a 4 to 2 encoder. Lab 3 introduced us how to create a block diagram by using a truth table and k-maps, and it taught us how to utilize VHDL code to create symbol files.

Acknowledgements –

The tasks for the lab were divided equally for every group member. Each member would rotate on who would work with the software and DE2 board to complete the current checkpoint. Along with the lab itself, the lab report was also equally divided among group members. This week, the group members have cycled roles for this report so they can work on a new task they didn't complete last week. For example, the member who worked on parts 1, 2, and 3 of the lab 2 report would now work on parts 4 and 5 for the lab 3 report. We decided as a group that whoever is responsible for parts 4 and 5 is also responsible for turning in the lab report on Carmen.