**What did you learn from this project?**

This project brought to surface greater understanding of the development of ISA and datapath construction. Having learned assembly code, I had always wondered how these instructions were executed in binary. This project brought forth much greater understand into the development and microprocessor. This also allowed me to further understand how to analyze and test my VHDL code. I was forced to use ModelSim to simulate which, in my opinion, is much more tedious than that of the Aldec simulation, but it is always good to learn different ways to simulate software components in case one fails.

**What would you do differently next time?**

If I could redo this entire project, I would do my best to thoroughly refresh myself on VHDL. The time it took me to become readjusted when the VHDL environment took up more time than I would have anticipated. This time could have gone towards more coding than relearning. I would also, if the time allotted, liked to have tried developing a pipeline datapath. Pipeline is notably faster than single and mutli-cycle in most situations, but that also means it is more tedious to develop. It would require how to code and test each interface buffer and much more care would need to go into taking care the data, control, and structural timing hazards. Many of these issues do not need to be compensated for in single cycle because the CPI is the same for all the instructions in single cycle. As a result of being so tedious I was not able to create this form of datapath but it is definitely something I intend to do in the future.

**What is your advice to someone who is going to work on a similar project?**

I would definitely recommend that one read all parts of the project before starting. This will help for future development of one’s ISA and microprocessor. For instance, understanding what components one will need to have for one’s ISA will help determine how much time one is willing to put into coding said components and how complex the datapath will be overall. Reading all parts beforehand allows one to more easily breakdown the contents and the connections of his or her architecture. I tried to do each part as I went along but it overall made things more difficult