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Computer Architecture

Project Part 6 Report

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The project for this class was to build a computer processor from scratch. Coming into the class, I really had no idea how a processor worked but I was very excited to learn about it. It was really cool to learn about all the different types of processors there are and how everything got assembled together and worked. It was really cool to learn how processor cashe worked and what it was useful for and how important it is to have a good compiler.

If I could do something next time it would have been to build a multicycle data path instead of single cycle. Because the memory that is used takes some time to get the information out after the address is sent, the processer can potentially process instructions that are meant to be skipped. With multi cycle, it would be a bit easier to process the correct the instruction on the correct cycle. Another thing would be to realize that the address needs to get to the memory at the correct time is important. If they don’t, you will process an instruction that doesn’t match up quite right with the address.

My advice to someone working on a similar project is to be aware of the clock. While for single cycle it’s possible to think that it really isn’t as much of a deal as it is for multi cycle or pipelined but it is just as important. Once the address is sent to the memory, it still takes another clock to get out so if the address being sent changes on the same clock that the information in memory needs to be coming out, it is going to cause timing issues. Mainly, keep in mind how the memory works. Also, don’t waste time. Debugging issues is going to take longer than just writing VHDL, and much more time than originally thought.

Overall this was a really fun project and it’s really cool to think that the finished product is a working processor.