ECE 368 CISC-24 Project Post Mortem

Team 2

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# Management

The group consisted of only two students, which made for easy management of tasks. Tasks were divided into two fields, design and test. Design tasks consisted of writing and editing component modules and running the synthesize tool to ensure the design was ready for simulation. Testing tasks consisted of implementing and running test benches to confirm the functionality of the designer’s code. At the beginning of the project, test benches were developed for all new module additions prior to being instantiated within the final design. Once the base files were confirmed functional, the control unit was added and constantly updated. If any issues rose from the code in simulation, then it could be traced back to the control unit since it was the only module left untested. By doing this, both the designer and tester were able to quickly find bugs and address them with little to no hassle.

# Communication and Coordination

The small size of the group ensured strong communication between each member. Since we have both worked together on numerous occasions, we both understood our partners strengths and weakness and worked coherently and efficiently. We attended all lab periods and worked till the end plus more additional hours by permission of the lab TA. Since our tasks were mitigated early on, not much verbal communication took place during lab hours. We feel that this could have been improved by working more closely with one another rather than delegate specific individual tasks. This would have saved us time from explaining design additions outside of lab. When working outside of lab hours, we would often communicate by phone to ensure progress was steady. Our most helpful team trait was our familiarity towards one another. We frequently communicate outside of lab and school hours. We believe this helped improve our working relationship on the project. It is a trait that could benefit group members who are not so easily acquainted with one another.

# Development

As mentioned prior, both software and hardware tasks were designated as design and testing tasks. These were assigned based on our individual skillsets. Although the tasks were better suited for each individual, doing so eliminates the chance of working outside the comfort zone, which is crucial in the professional field. This was more prevalent with documentation. Reports and datasheets were written individually and encompassed one singular viewpoint rather than both. Improvements should be made to work more in unison when documenting labs or projects. Doing so will not only lead to higher grades, but it will also force each of us to learn more from each other.

# Analysis

Out of the total 88 instructions, 75 were successfully implanted through the course of the semester. Each instruction was simulated prior to implantation. When problems arose, the control module was frequently edited to accommodate for issues like timing and data path control. The downside of working in a bottom up approach was working to accommodate for additional control signals on lower level modules. Very frequently we found ourselves needing more bits and input signals for multiplexor components and latches for time sensitive data. Adding these changes proved time consuming and often generate many error due to the hasty improvisations and impatience. The coding method was not the most efficient, but working from the bottom up gave us a deeper understanding of the system as a whole.

One of the main omissions was interrupt service routines. By the end of the semester, the final product was remodified so many times that adding interrupts seemed like another costly and potentially code breaking implementation. Had we have more efficiently modified and updated our design, we believe that interrupt routines could have been handled. For the stability of the final product, interrupt handling was omitted in conjunction with commands like block memory movement, multiplication and division.

# Conclusion

In conclusion to this project, our groups positive chemistry and hard work ethic proved to help better understanding the workings of a Von Neuman CISC computer architecture. Continuous testing through the design process was laborious and time consuming, but provided successful results and a positive outlook on our project towards the end. Despite missing several instructions, the general functionality was understood but chosen to be omitted based on keeping a stable and working product for demonstration. More collaborative designing and documentation should be done in the future to ensure all members are on the same page instead of relying on individual skillsets to accomplish major tasks.