Systems Processor Project

Derek Nordgren

Rees Klintworth

Derek Tiggelaar

**Considerations**

* We have an ALU that has mux behavior built into it. This is atypical because ALUs usually interact with muxes that are outside of it. We included the mux behavior inside the ALU because it made the most sense to us at the time of implementation. Along with including this inside the ALU, we also had two bring in several other uncommon variables. In order to have the mux functionality, our ALU takes in an rd and also takes in op code.
* We created some custom muxes in our branch/jump logic. We now believe that we created our branch/jump logic in an unorthodox way.
* We created the LW and SW instructions in one component. This component intercepts information between the ALU and the RAM and triggers whether it is appropriate to display information onto the board.
* We wrote a majority of our individual components in VHDL. The only components that we did not write in VHDL was the Register component and the Ram and Rom.
* The Program Counter and the +1 are separated to prevent off-by-one errors and to make jumping and branching easier to implement for us.
* Our assembler accepts assembly code that matches the example assembly code that was provided to the project. Our assembler also has extensive error catching with graceful failure actions. These actions are coupled with responsive messages that are very helpful for debugging purposes.