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Professor Nicholas Weaver
CS61C: Great Ideas in Computer Architecture (Machine Structures)
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Project 3B Makeup Write-Up

Unfortunately, due to extenuating circumstances related to the current shelter-in-place order, which was recently placed at the time this original project was due, I was not able to get to the point where a submission for this portion of the project was possible. Thus, I am not able to link my original project 3B submission, and I have linked my CS61C main course page as evidence of this:

https://www.gradescope.com/courses/73373

Furthermore, due to my inability to originally make a submission, there were no specific bugs I found and correspondingly no specific tests I made. In essence, “what was wrong with my code” was that it was not written, and I found this major bug by seeing the no “submission” title on gradescope. I fixed this bug by completing the project.

That being said, I did write a large number of tests through the process of completing the project as the final task required. These tests, as is specified in the spec, were in one of three categories: unit tests, integration tests, and edge case tests; all of which can be found in ./proj3/tests/part_b/custom/inputs. My unit tests are all labeled by the single instruction they are meant to test i.e. mul.s, mulhu.s, etc.. My integration test, labeled edgetegration2.s, aimed to create a large mixture of a large majority of the commands to ensure they all worked properly in conjunction with one another and also the CPU maintained accuracy across a large number of inputs. Lastly, my edge case tests include potential corner cases I could think of such as the classic 0xDEADBEEF example mentioned in lecture (with the test labeled deadbeef.s) and jumping to a PC address not assigned to an instruction (tested in jumptest3.s). These tests did, in fact, reveal bugs in my CPU including an incorrect output from ALUsel for some R-type instructions and an incorrect regWEn signal for sw, both of which I debugged using the poking tool in addition to the previously mentioned tests. I could not quite figure out how to simulate the test circuits while looking within the subcircuit components as I am sure that would have made the process smoother.

On a final note, I would like to mention the immense gratitude I have for the 61c course staff and Professor Weaver for allowing us this opportunity to make up these projects as it really means a lot, especially considering the extenuating circumstances surrounding the due date of this specific project. By allowing these makeups, not only is learning from our prior mistakes incentivised, but a second chance is given to those students, including myself, who were not able to properly digest this valuable information the first time around. Two very commendable achievements which I believe sets a great model other classes really should follow. Thanks, again!

Sincerely,
Akash Kumar