Progress Report:

CP0, CP1 work. CP2 is waiting on memory

Functionality	Testing Strategy	Who worked on this component?
Static Branch Prediction	Removing NOPs from cp1 test code near the branch statements	Andrew
Data Forwarding	Tested using test codes, similar to previous labs.	Matthew
Memory System	Shadow memory with test code	Tim, Andrew
Advanced Features Design	NA	All

Roadmap:

CP3 Requirements:

- L2+ Cache (Tim)
- RISC-V M Extension (Matthew)
- Advanced branch predictor (Andrew)
- 4+ way set associative Cache (Parameterized Cache?) (All)
- Eviction Write Buffer (All)

The 4+ way set associative Cache will likely work similarly to the 2 way set associative Cache created in MP3. This will be implemented in the L2 cache, which will interact with the arbiter and physical memory as a secondary cache. Issues that may come up include the combination of the L2 Cache with the arbiter, as well as the parameterization, so it is important for us to be completely sure the L2 Cache is fully functioning before expanding the cache to include the other advanced features.

The Eviction Write Buffer will be used in between the L2 cache and the physical memory due to the slower nature of the physical memory. We plan on implementing the L2 cache as well as make it 4 way set associative first before implementing the eviction write buffer. Most issues with the eviction write buffer will come from connections, as the state logic diagram is fairly simple, but the L2 cache has

The advanced branch predictor implementation will likely be a tournament predictor as explained above. It will use a simple local predictor and a correlation predictor as the two contestants.

This will likely also include a simple BTB with a similar design as presented in lecture.

For now, I plan on implementing an add-shift multiplier for the M extension, similar to what we did for part of MP1. However I looked into other possibilities such as Wallace tree and Dadda multipliers, and if the simple implementation proves to be easy I will likely implement a more advanced multiplier.