CSCI2321 Final Review Sheet

The exam for this class will have roughly ten questions on it that will cover all the material that we have talked about in class and that can be found in chapters 5-9 of the book. Because of overlap the test will indirectly also require you to know the information that was covered on the midterm as well. The format of the questions will closely mirror the midterm and should be something of a split between the quizzes and your assignments. The exam will be open book. That is primarily intended to help you with little details so you don't have to memorize all the MIPS commands or other details. While the time limit on the final is much longer than on the midterm, if you have to be looking much stuff up you will still run into significant problems. Below is a list of the topics we have discussed that could appear on the test. I won't promise that it is complete, nor will I promise that everything on the list will be on the test. For all of the things on this list, you should understand them, their advantages and disadvantages, and how they relate to other options.

Single-cycle datapath – Know what this is and how it works with the subset of instructions that we used it for. You should also know how to extend it to add more functionality. Lastly, you need to be able to describe the control system and tell me what the state of the control lines would be for certain commands. You should also be able to describe the advantages and disadvantages of this type of datapath.

Multicycle datapath – You need to be able to do basically everything mentioned above for the single-cycle implementation.

Microprogramming and FSAs for control – Know how both of these are used in controlling a multicycle implementation. Be able to create or extend one to add new functionality.

Exceptions – You need to know how these are handled in the datapath.

Pipelined datapath – Here again you should be do all the things listed above for the single-cycle implementation. In addition you should know the more recent variations on pipelining and what they can do for us (superscalar and dynamic pipelining).

Hazards in pipelining – You need to know the various hazards that can occur with a pipelined datapath and how we get around them. Know what series of instructions cause those hazards.

Caching – You should understand why we have caching in computers and how the different caching designs work. Also know the advantages and disadvantages of different caching scenes.

Virtual memory – Understand what virtual memory is, how it works, and why we use it. What additions are made to hardware to make virtual memory practical? In what ways is virtual memory like caching?

I/O devices and buses – Know why we use buses, what the different types of buses are and what their strengths and weaknesses are. Also know something about arbitration on buses.

Multiprocessor designs – Not much required here, mainly the different schemes and the difficulties (like cache coherency) that can be encountered.