Part 1

Provide an overview of MIPS and ARM based processors. Discuss: architectural fundamentals and functional blocks, performance, and applications.

Part 2

Design a 32-bit MIPS processor implementing at least the following functional blocks: Program Counter, Instruction memory, Control, Registers, ALU, and data memory. Based on the implemented functional blocks, determine the subset of the core instructions that can be performed. Perform the following:

1. Develop an appropriate testbench to test your modules in simulation
2. Synthesize and implement your design on the FPGA. Develop a methodology to test the functionality of the design and compare with simulation results.
3. Discuss the FPGA utilization.
4. Attempt to increase throughput by the inclusion of pipe-lining

You may choose to design an ARM processor instead.

Part 3

Document this all in a report (5-10 pages with pictures)

Part 4

Be prepared to present the simulation to me in class.

Notes

- Be prepared to discuss you implementation of the architecture (MIPS or ARM)
- Did you close timing? (all slack positive)
- Try to work the following questions into your report. It's best if these become part of the report instead of a list of questions to answer.
    - What did you enjoy about this project?
    - What did you not like?
    - What was the hardest part?
    - What did you learn?