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CS 3339
Project Proposal
3/3/2018

Python CPU Simulation

Problem Description

I intend to implement a CPU simulator in Python capable of processing a few simple instructions. The implementation will be based on MIPS. I find this particular task useful and interesting as it will help me gain a deeper understanding of how a processor works on a fundamental level. After implementing each piece of hardware in Python, I will have a better idea of how they all work together to produce the desired output.

The expected result of this project is to have to be able to feed my Python program a set of instructions, have the simulator process the instructions similar to the way that a processor would, and display the correct result.

Methodology

The following pieces of hardware will be implemented in separate .py files:

- ALU
- Logical Gates
- Registers
- Memory
- Multiplexer

Each of the above files will be imported into the main.py file, which will serve as the control unit for the processor. I am open to suggestions on what types of instructions MIPS should be supported by this project, but at the very least I plan to implement ADD, LOAD, and STORE instructions. Other instructions currently being considered are JUMP and BRANCH instructions, but it is hard to say what I will be able to accomplish in the allotted time.

Deliverables

The .py files listed above will be the deliverables for this project, as well as an in-class demonstration.

Team Members and Specific Roles

The entire project including the proposal, code, and presentation will be completed by Ross McEwen.