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Class: CS 4348

Project#1

Project Purpose:

The purpose of this project is the emulate the Von Neumann architecture of a processor. There are only two actions Fetch and Execute. The second project purpose is understanding low-level concepts of operating system where has processor interaction with main memory, system calls, interrupt handling, memory protection, procedure calls. This should have been simple in theory. However, as always the devil is in the details.

Implementation:

The programing language used for this project Java. The CPU program would pass an address to the Memory program and the memory would return a value (the instruction) the CPU had to parse and execute the instruction. Occasionally the CPU had to write a value to the memory. A timer would cause an interrupt, the CPU would save the program counter to the stack, handle the interrupt and return to continue the execution of the program.

Personal Experience:

This was a very challenging project. However, the difficulty did not arise from the coding aspect of the project which was fairly simple but from understanding of how the CPU and Memory interact at a deep level. This project also surfaces the genius of the Von Neumann architecture and all the genius other engineers who worked for decades to make this architecture possible. We too often write code without a firm grasp of what is happening at the hardware level. This project illustrates the intellect and creativity hardware engineers, we too often forget their contributions.