Computer Organization and Architecture

Introduction

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Introduction

Reading: None

Overview

This course is about:

- Understanding how computers work
  - not how to use them
- Learning the truth
  - we've been lying to you
- Developing intuition
  - the better you understand the low-level stuff, the better you will be at the high-level stuff
- Learning a few miscellaneous things you need to know
  - ssh
  - source control

Overview

For the hardware part, we will do roughly one project per week. We will break each software project into several pieces:

1. Boolean logic (start the CPU)
2. Boolean arithmetic
3. Sequential logic
4. Machine language
5. Computer architecture (finish the CPU)
6. Assembler (start the compiler)
7. Virtual machine I: Stack arithmetic
8. Virtual machine II: Program control
9. High-level language
10. Compiler I: Syntax analysis
11. Compiler II: Code generation (finish the compiler)
12. Operating system (we will skip this project)

Overview

- We will have a midterm exam after the hardware projects
- We will have a final exam that focuses on the second half of the course

My expectations:

- You will read every word of the book
- You will do your own work (except when I explicitly permit working together)
- If you get stuck or do not understand something, you will ask me for help
- You will work hard, and you will find at least some of the material to be very difficult

Getting started

- Buy the book ($26 from Amazon, $16 for Kindle)
- Install Java (if not already installed):
  `sudo apt-get install default-jdk`
  `http://www.oracle.com/technetwork/java/javase/downloads/index.html`
- Download the software:
  `http://www1.idc.ac.il/tecs/software.html`
- Download the projects:
  `http://cit.cs.dixie.edu/cs/2810/projects.zip`
- Work through project 0 (ungraded):
  `http://www1.idc.ac.il/tecs/projects/00/index.htm`
- Read chapter 1