PDP-8 ISA Simulator

Deborah Denhart  
Jeremiah Franke

# Purpose

# Requirements

* Write an ISA level simulator for the PDP-8 architecture
* Generate a memory trace file with the format:
  + <type> <address>
  + <type> can be:
    - 0 for data read
    - 1 for data write
    - 2 for instruction fetch
  + <address> will be in octal format
  + The data that is read or written will not be displayed
* The different types of input can be:
  + Binary
  + ASCII hexadecimal
  + ASCII octal
* All instructions will be implemented
  + Except for I/O and group 3 microinstructions
    - Handled as NOPs
    - Has a clock cycle of 0
    - Print a warning
  + Must be clock accurate
  + Indirect addresses add 1cycle
  + Auto increment adds 2 cycles
  + Start at address 200 or assume the first address is the start
* Generate a summary at the end of execution
  + Total number of instructions executed
  + Total number of clock cycles consumed
  + Number of times each instruction type (by mnemonic) was executed

# Design

# Implementation

# Testing

## Parsing different types of file input:

When the right file is run with the right flag ([default]/.bin, -o/.obj, -v/.mem), the three outputs should all be equal. Proper error handling should occur when a flag is incongruent with the data format within the file.

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Binary | Octal | Hexadecimal |
| Flag | [default] | -o | -v |
| File Input | -f add01.bin | -f add01.obj | -f add01.mem |
| -f add01.bin | DEBUG address: 0200  DEBUG address: 7300  DEBUG address: 1250  DEBUG address: 1251  DEBUG address: 3252  DEBUG address: 7402  DEBUG address: 5200  DEBUG address: 0250  DEBUG address: 0002  DEBUG address: 0003  DEBUG address: 0000 | Error: Exceeded memory space... | Error: Exceeded memory space... |
| -f add01.obj | Error: Exceeded memory space... | DEBUG address: 0200  DEBUG address: 7300  DEBUG address: 1250  DEBUG address: 1251  DEBUG address: 3252  DEBUG address: 7402  DEBUG address: 5200  DEBUG address: 0250  DEBUG address: 0002  DEBUG address: 0003  DEBUG address: 0000 | Error: Exceeded memory space... |
| -f add01.mem | Error: Invalid binary file format... | Error: Exceeded memory space... | DEBUG address: 0200  DEBUG address: 7300  DEBUG address: 1250  DEBUG address: 1251  DEBUG address: 3252  DEBUG address: 7402  DEBUG address: 5200  DEBUG address: 0250  DEBUG address: 0002  DEBUG address: 0003  DEBUG address: 0000 |

# Source Code