CSCI 6461 Project Part 1

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Python Version Required: Python 3.10

Computer Operation:

1. Init button starts computer
   - 1.1 Opens file chooser to load the file
   - 1.2 Initializes the memory
   - 1.3 Sets PC to 0
   - 1.4 Waits for either run or single step (SS)
2. If SS is clicked
   - 2.1 Will run one instruction and GUI will be updated
   - 2.2 Continue to click SS to execute all the instructions one at a time
3. If Run is clicked
   - 3.1. The entire program is executed

Read IPL File

When Init button is clicked, the program will show a window to let user to choose files from computer.

After choosing the .txt file containing initial program, click the open button, the program will read the file and do the initialization.

GUI Layout

The GUI has

- 16 Switches to enter the binary code (Each can toggle between 0 and 1
- 4 General Purpose Registers (GPR0-4) (Loadable through Switches – Can Display and Change Value)

- 3 Index Registers (IXR1-3) (Loadable through Switches – Can Display and Change Value)
- 1 Program Counter Register (PC) (Loadable through Switches – Can Display and Change Value)
- 1 Memory Address Register (MAR) (Loadable through Switches – Can Display and Change Value)
- 1 Memory Buffer Register (MBR) (Loadable through Switches – Can Display and Change Value)
- 1 Memory Fault Register (MFR) (Can Display Values)
- 1 Index Register (IR) (Can Display Values)
- 1 Privileged Register (Can Display Values)

The Switches:

- 0-5 are Operation Bits
- 6-7 are GPR Bits
- 8-9 are IXR Bits
- 10 is I Bit
- 11-15 are Address Bits

Additional Functionality

- Create a binary value in GUI (Operation, GPR, IXR, I, Address)
- This binary value can be loaded in any of the registers that have **LD** buttons
- The binary value can also run instructions, assuming the correct Opcode is given for the instruction

Simple documentation describing how to use your simulator, what the console layout is and how to operate it.