

User manual

CSCI 6461



2018-2-9

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1. Summary

This project is a simulator of CPU.

We divide the CPU’s component into two categories.

For one part, we call it “chip”. Chip is the general term for all components that have operational capabilities.

For the other one, we call it cable. Cable is the components used to transmit data.

We use these two parts to simulate the processor from the hardware level.

For the clock cycle, we designed for two parts, ”tick” and ”evaluate”. “Tick” is the clock rising edge, registers load the value when “tick” is coming. “Evaluate” is the time for “chip” operating. Our registers change the output when “evaluate” is coming.

1. User Interface

A screenshot of a cell phone

Description generated with very high confidence2.1 Front Panel

Front panel is used to set the value to “chip” manual.

Front panel itself is a “chip”, we use some cables to connect it to our simulator.

The front panel has a total of 28 lights, divided into 2 lines, each with 12 and 16 respectively.

1)First line (12): the line with 12 lights is used to indicate the address of memory being manipulated.

2) Second line (16): the line with 16 lights shows the value we want to enter.

The Front panel has a total of 16 checkboxes. All the checkboxes are used to enter value.

Front panel have 5 Buttons.

1)Circle: Click Circle button will run the simulator for a complete circle, which consist of a tick and an evaluate time;

2)Reset CU Status: Click Reset CU Status button will set the control unit status to initialize;

3)Load PC: Click Load PC button will load the value into PC.

4)Load MAR: Click Load MAR button will load the value into MAR.

5)Load Data into Memory: Click Load Data into Memory button will load the value into memory, which address is stored in MAR, and after the evaluate ends, the value in MAR will automatic plus 1.

A screenshot of a cell phone

Description generated with very high confidence2.2 Control Panel

We use control panel to load the document into simulator.

Control panel have 2 textboxes.

1)The text box - To Address beginning at, is used to set the beginning memory address.

2)The text box – Program, is used to put instructions.

Control panel have 1 button.

1. Load Program: Click the Load Program button will load the instructions into simulator.

2.3 Virtual Machine

A screenshot of a cell phone

Description generated with very high confidence

We use the panel to show the internal state of the simulator.

This panel has 4 buttons.

1)Tick: Click the Tick button will run the simulator for a half circle, which consist of a tick or an evaluate time. Note the difference between tick and cycle;

2)Auto tick on/off: Click Auto tick on/off button will automatically run the simulator, the cycle we set is 1s;

3) Show control panel: Click Show control panel button will open the control panel;

4)Show front panel: Click show front panel will open the front panel.

1. Changelog
   * 09 Feb. 2018: the first version of User Manual.
   * 09 Feb. 2018: adjust the format