**CSCI-6461**

**Class Project**

**User’s Guide for Project Phase 2**

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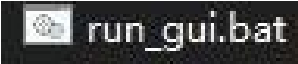
1. **User’s Guide Overview**

This User’s Guide for the Class Project Phase 1 consists of six main parts:

* + User’s Guide Overview
  + Main GUI
  + Buttons
  + Indicators
  + Cache indicator
  + Virtual Keyboard
  + Run Test Program 1
  + FAQ

1. **Main GUI**

How to open the main GUI?

In order to open the main GUI, please open the **run\_gui.bat**  in the folder

[delivery].

The main GUI consists of register indicator, cache indicator, switch, signal, virtual keyboard, output box and logging bux, the simulator interface and the debug console which will be showing below.

Graphical user interface, table

Description automatically generated

This is what the main GUI looks like upon start. We use Pyqt5 library in Python as the course recommended to construct the whole user’s interface.

As we can see, the user interface of our emulator is functionally consistent with the requirements. Also, there is a debug console for the output. For those buttons and indicators, this user’s guide will cover below.

1. **Buttons**

Our emulator has few major control buttons and ,few LD buttons for each registers and few number buttons to store numbers as shown below:

A screenshot of a computer

Description automatically generated with low confidence



These buttons above are used to control the emulator.

For the detail functions of major control buttons:

**[Store]**:

This button stores the content of the MBR register to memory at the address specified by the content of the MAR register.

**[St+]**:

This button does what the “Store” button does and increments the MAR register by one.

**[Load]**:

This button loads the memory content at the address specified by the content of the MAR register to the MBR register.

**[Init]**:

This button clears the contents of all registers.

**[SS]**:

This button runs a single stage (fetch / decode / execute).

1. **Indicator**

Qr code

Description automatically generated with medium confidence

**[Halt]**:

When this indicator is checked, the emulator is in halt.

**[Run]**:

When this indicator is checked, the emulator is in running.

**[Input]**:

When this indicator is checked, the emulator is waiting for user input from keyboard.



Indicators like this show the memory address of each certain register.

1. Cache Indicator

Table

Description automatically generated

This is what cache indicator will look like after the test program. You can choose the indicator’s format by selecting through ratio button to change format between hexadecimal, decimal and binary. Also, the last hit, updated and replaced cache will be marked with different color.

1. Virtual Keyboard

A picture containing text, electronics, keyboard

Description automatically generated

This virtual keyboard serves as the input for simulator’s program. Please note that this keyboard is only effective when the Input indicator is on.

When Input indicator is on, the program will pause and wait for user’s keyboard input.

After hitting a button in keyboard, the program will read the input into desired register and resume the program.

1. **Run program 1**

* In the delivery folder, you can double click on **run\_gui.bat** to start the GUI.
* After GUI starts, either choose to use switch and LD button to load custom data or use **init** button to load the IPL.txt in the same directory. You can simply change the IPL.txt to load your own program.
* After hitting the init button, enter the start address using the LD button on the left of the PC indicator.( The program starts at 0x0100, 256)
* Now the simulator will look like below and ready to run.

A screenshot of a computer

Description automatically generated with medium confidence

* Hit the **run** button to run the whole program or **SS** button for single step, The program will output Plz Input[A-U] to ask user input a number, This process will loop for 20 times and ask the user to enter a final number(Plz inputU)
* Please use digit button in virtual keyboard to input number digit and use enter to confirm a valid input. For example, after input indicator is on, click 1. And wait for the input indicator. Then click 2. And wait for the input indicator again. Then click enter. With this procedure, you have entered 12 as the first input into the program. The screenshot below shows how the GUI looks like after entering 12
  + If a key in keyboard is pressed during the run without the input indicator, it might break the current run cycle and stuck. If you found the output box is not outputting the number you entered, please press the “run” button again and try to continue enter the number.
* Graphical user interface

  Description automatically generated
* This procedure will loop for 20 times and ask user to enter a final number(Plz Input U)
* A picture containing graphical user interface

  Description automatically generated
* After Taking the final number, the program will calculate the closest number in the previous 20 numbers to the final number and print the closest number.

A screenshot of a computer

Description automatically generated with medium confidence

* The simulator output will look like below after inputting some random number and 3333 as final number. As can be seen the program successfully calculated the closest number 5693 and output. The complete output is like this.

Plz InputA

12

Plz InputB

233

Plz InputC

908

Plz InputD

609

Plz InputE

56900

Plz InputF

7777

Plz InputG

6790

Plz InputH

54

Plz InputI

78

Plz InputJ

45

Plz InputK

67

Plz InputL

6

Plz InputM

10000

Plz InputN

89

Plz InputO

57

Plz InputP

7

Plz InputQ

59

Plz InputR

5693

Plz InputS

651

Plz InputT

5987

Plz InputU

3333

5693

FAQ:

If the GUI failed to start using the run\_gui.bat, you can choose to run the GUI using **simulator\_GUI/simulator\_GUI.exe**

If you are running the GUI from here, please replace the **simulator\_GUI/IPL.txt** for loading custom programs.