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

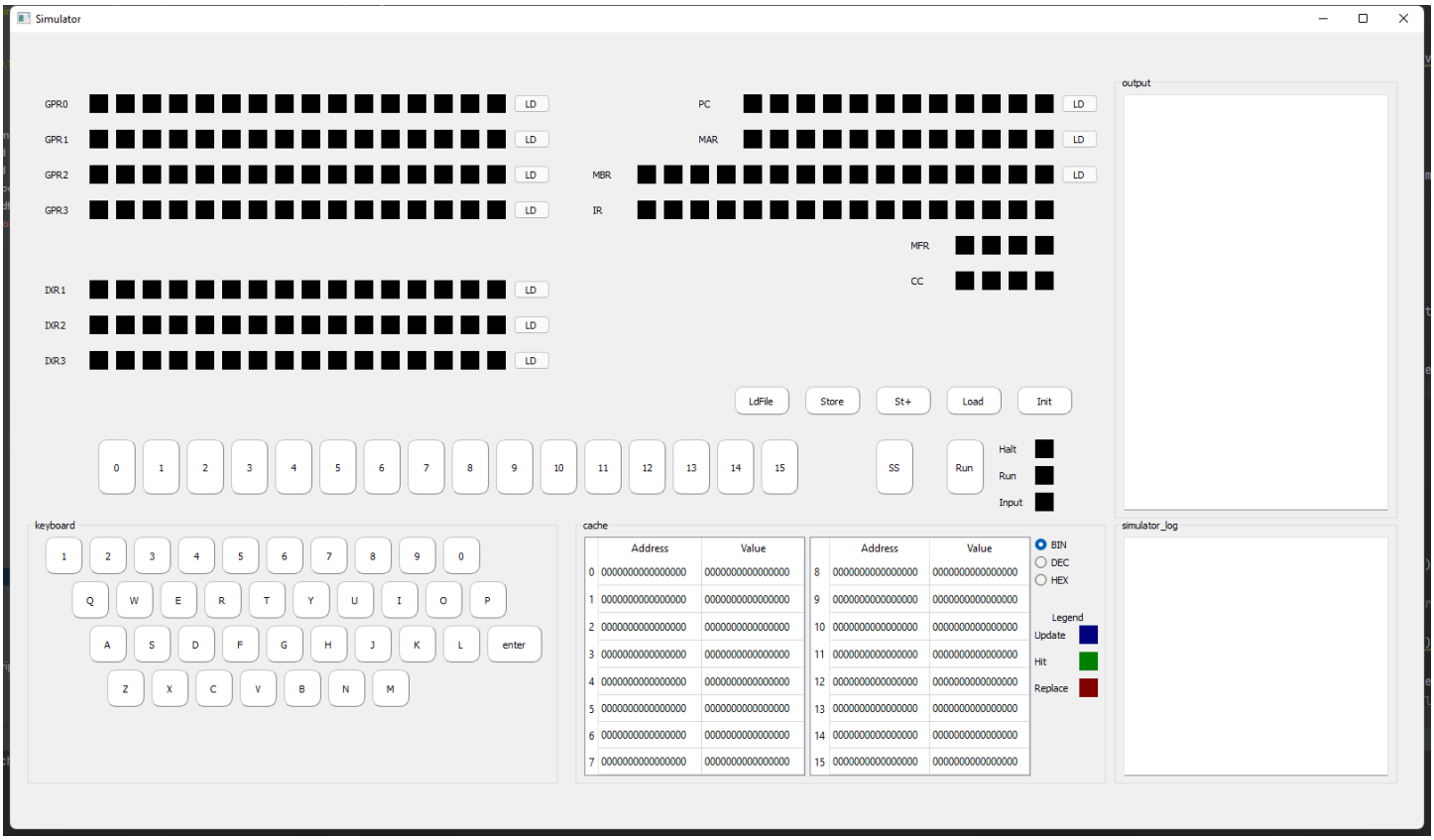
2. Main GUI

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.



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.

3. 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:

These buttons above are used to control the emulator.

For the detail functions of major control buttons:

[LdFile]:

This button will provoke a file selector window and ask user to select a file from disk. After the file is selected, the simulator will load the file into the memory starting at current PC value.

[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.

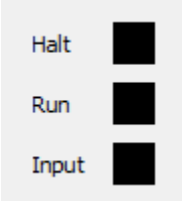
[Init]:

This button clears the contents of all registers.

[SS]:

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

4. **Indicator**



[Halt]:

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

[Run]:

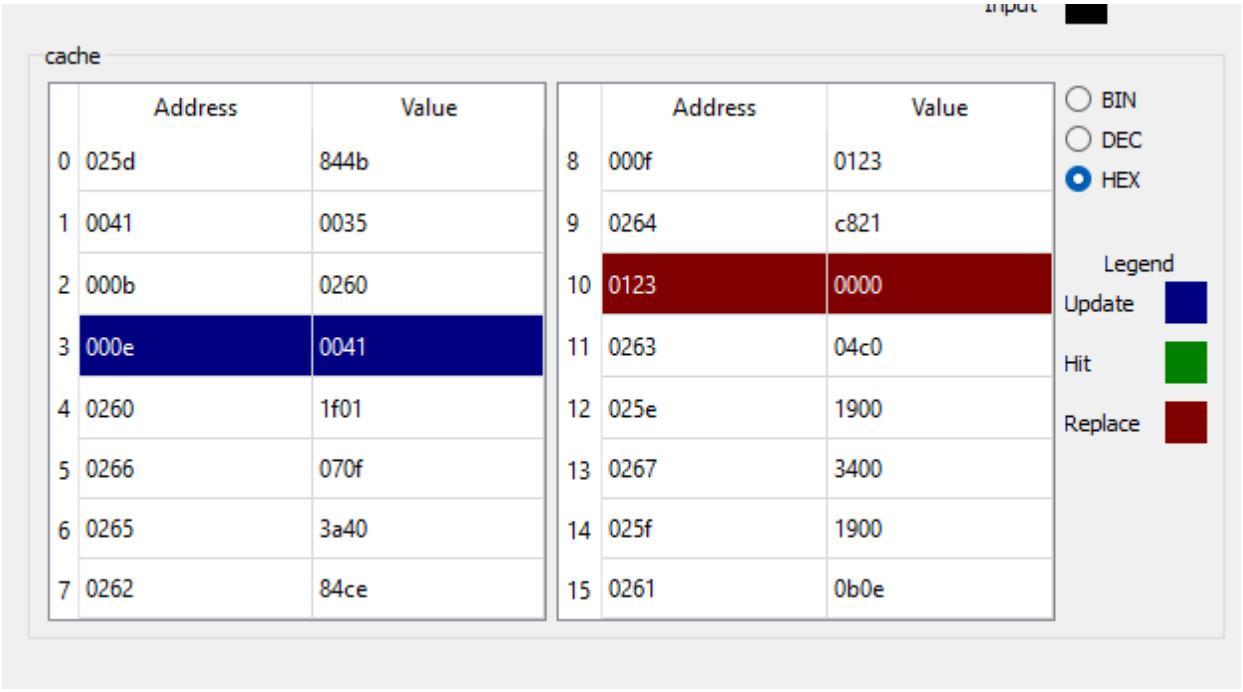
When this indicator is checked, the emulator is in running.

[Input]:

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

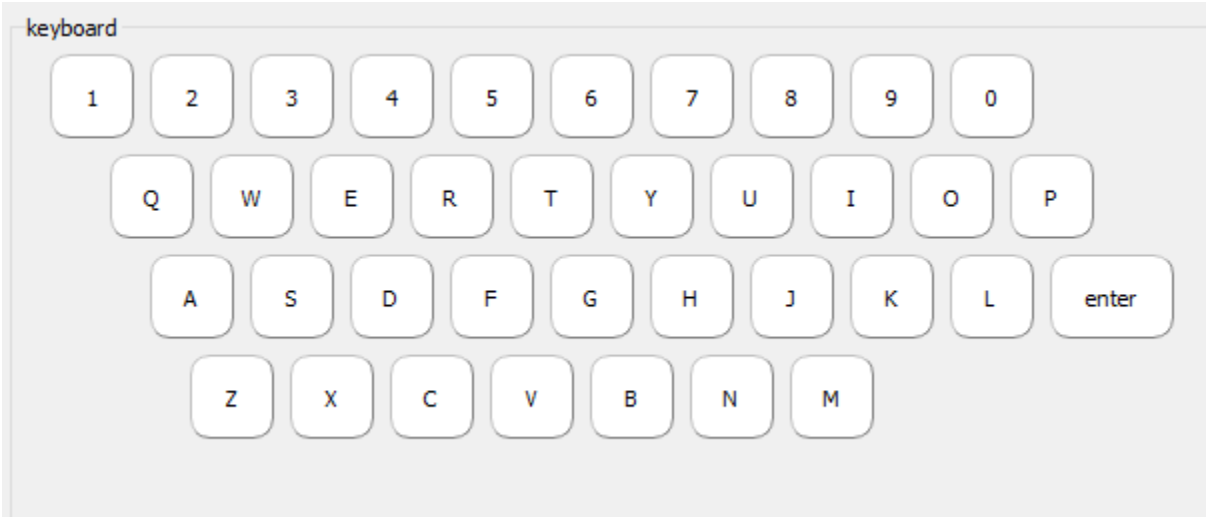
Indicators like this show the memory address of each certain register.

5. Cache Indicator



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.

6. Virtual Keyboard



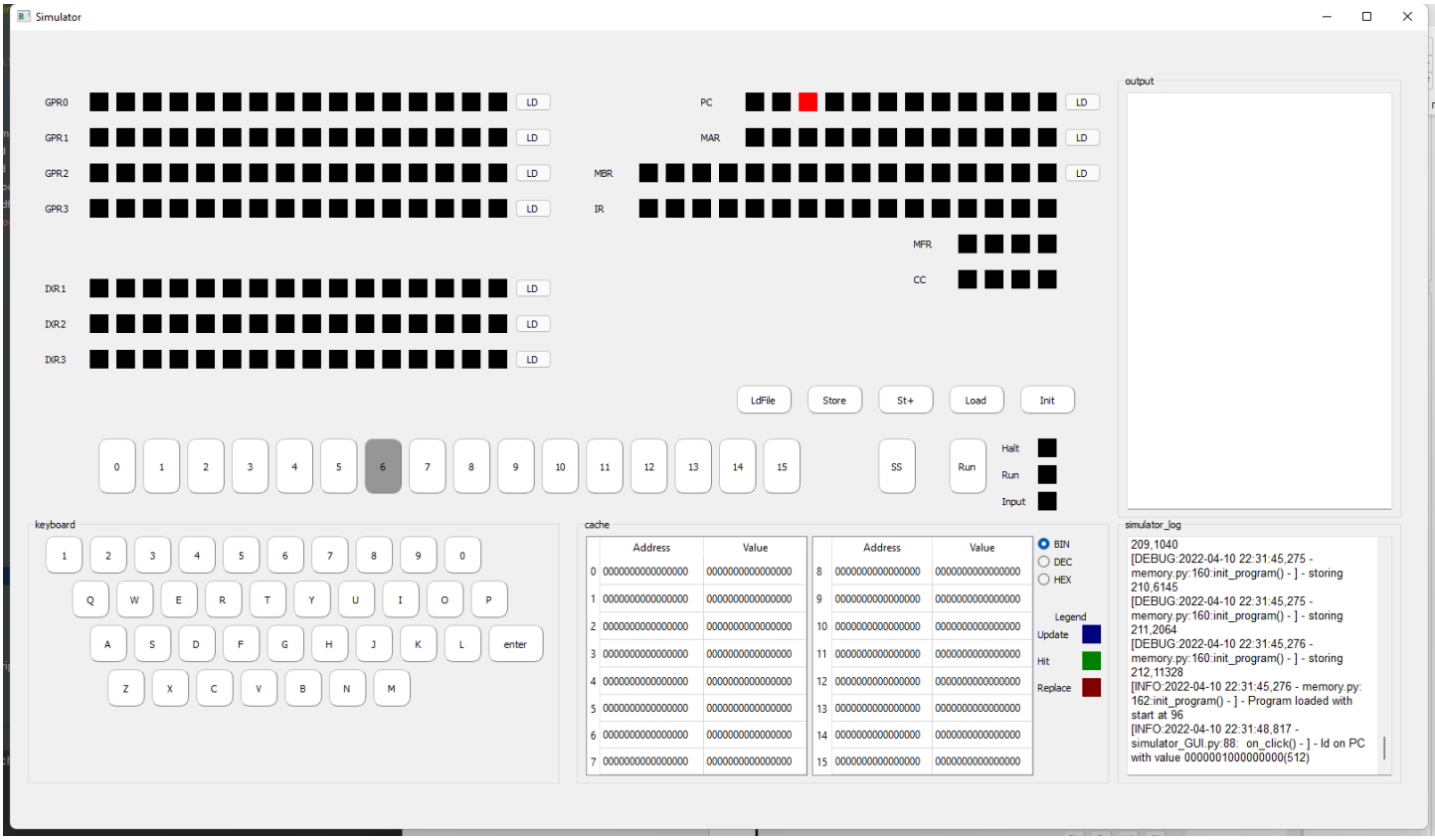
This virtual keyboard serves as the input for simulator's program. Please note that this keyboard is only effective when the Input indicator is on.

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

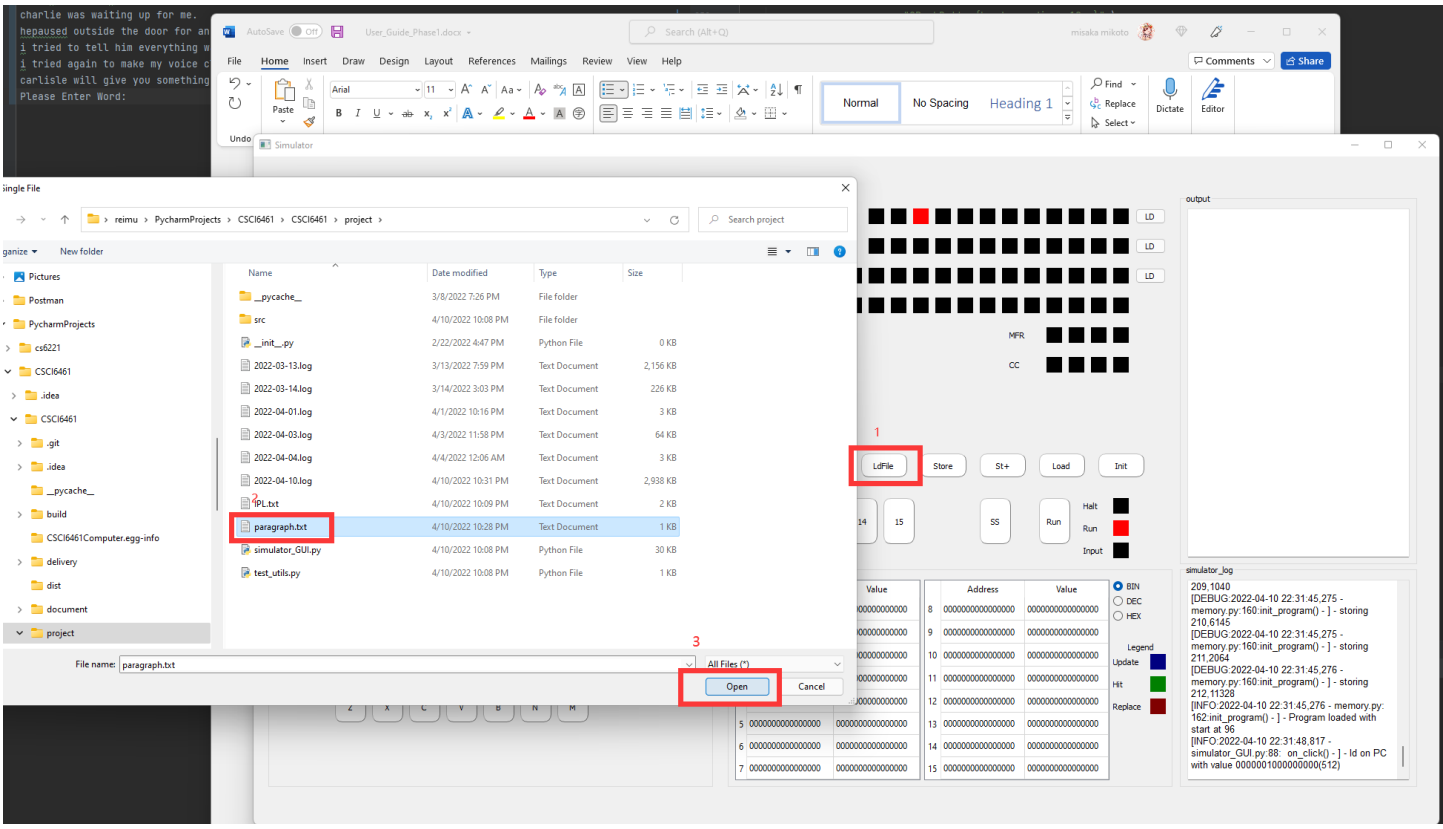
After hitting a button in keyboard, the program will read the input into desired register and resume the program.

7. Run program 2

- 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, the program is loaded, then **please set PC to 512**(click on switch 6 and click LD button on the left of PC indicator)



- Then hit the **LdFile** button to load the target file into memory. This will provoke a file selector. Please select "**paragraph.txt**" in the selector, or any other file you'd like to try. (No longer than 1500 words)

- 
- Please check the logbox on the right bottom of the GUI, it should say “load finished, start 512, end 763” upon a successful file load.
- Now the program is ready to run, please **load 96 into PC**(click on switch 9 and 10 then click LD button on the PC indicator)
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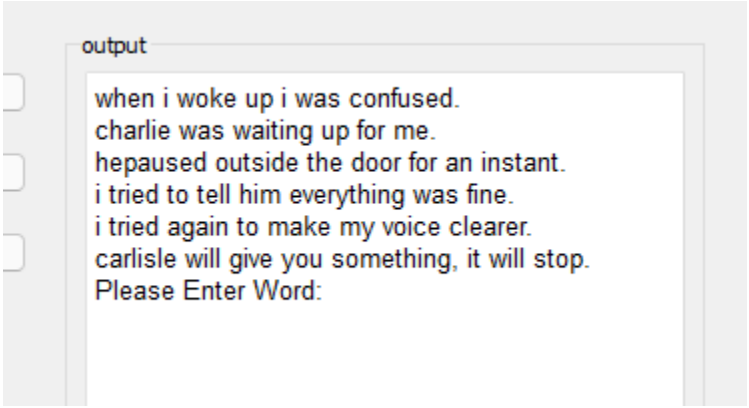
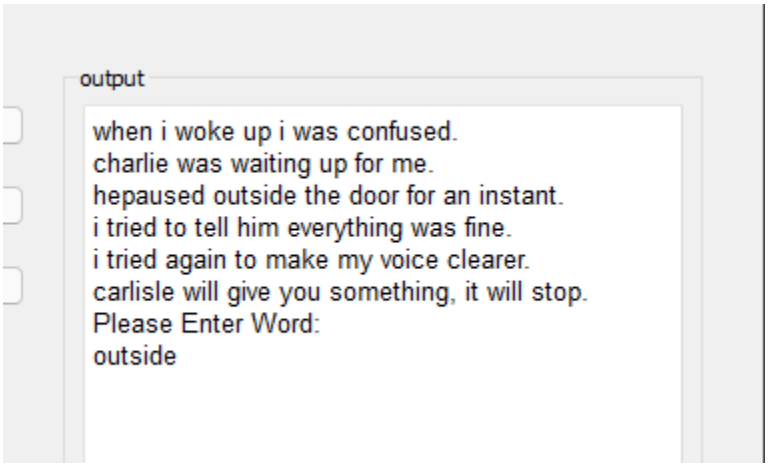
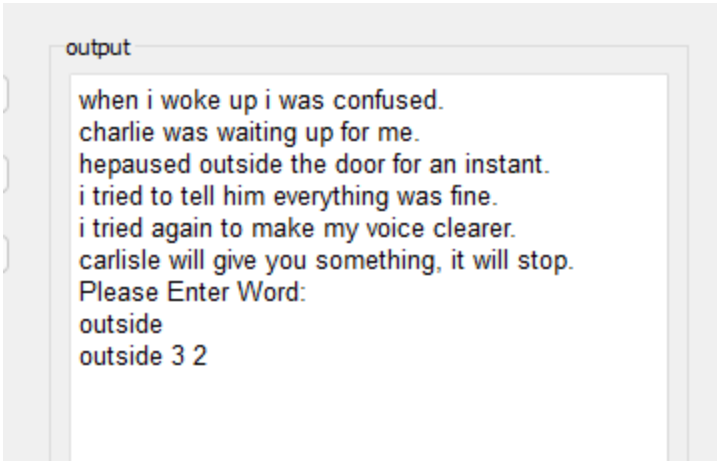
- Click **Run button** to run the program.
- The simulator will out put the text you’ve loaded in the output box and ask you to input a word.
- 

- Please use the virtual keyboard to enter the word and hit **enter** on confirmation. E.g(O U T S I D E Enter)
- 

- After hitting enter, the simulator will continue to run and tries to find this word in the text.
- 

- As shown above, **outside** is the second word in the third sentence.

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.