GEORGE WASHINGTON UNIVERSITY

Fall 2023

CSCI 6461 Computer System Architecture

Project Part 3 - Simulator for Executing All Instructions

User Guide

Team 12 -

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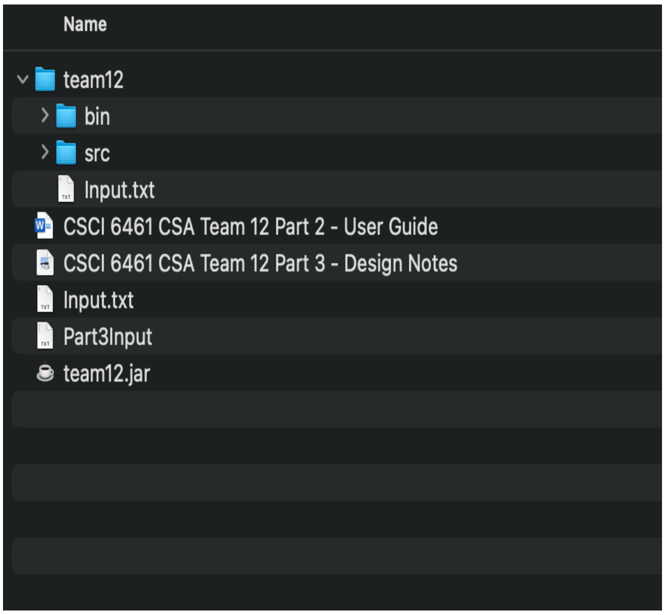
1. **Preparation Instructions:** Install Java.

2. **Download the below file from the blackboard: Filename:** Team 12_Project 3.zip

3. **Execution Instructions:**
   a. Download the file named Team 12_Project 3.zip.
   b. Extract the zip file and make sure all the files indicated below are present before you run the jar file.



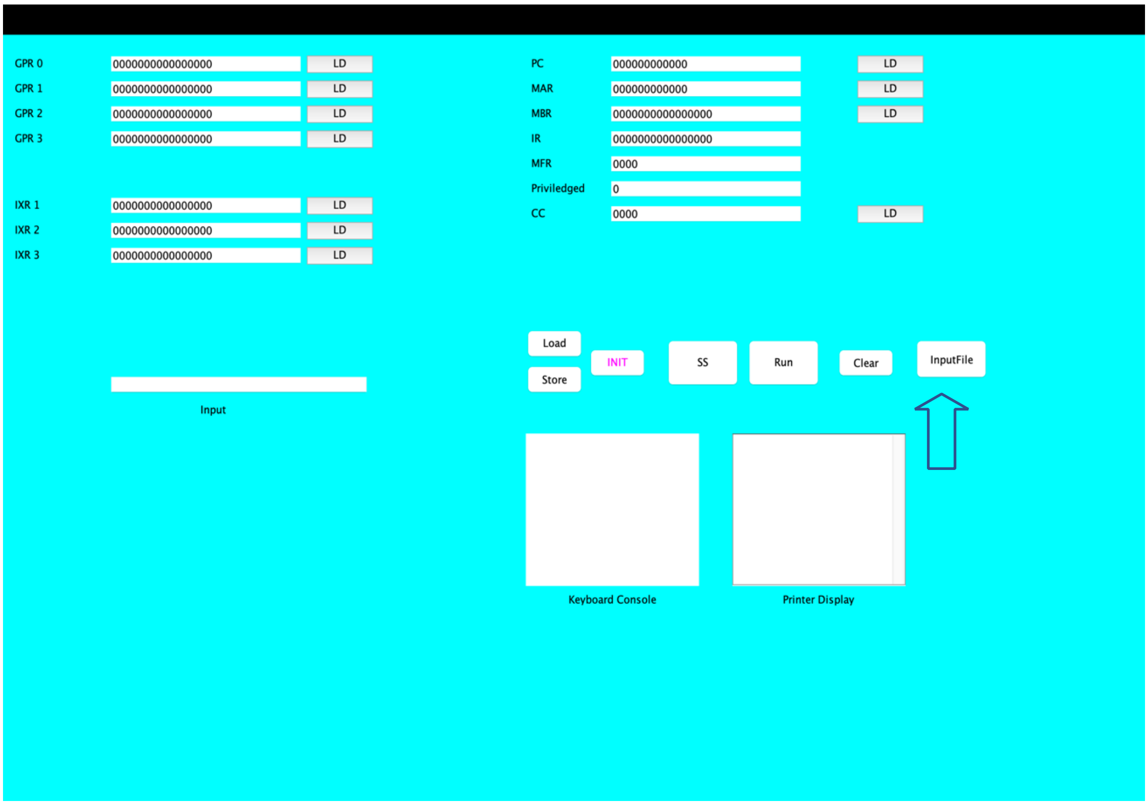
Name

- team12
  - bin
  - src
  - Input.txt
- CSCI 6461 CSA Team 12 Part 2 - User Guide
- CSCI 6461 CSA Team 12 Part 3 - Design Notes
- Input.txt
- Part3Input
- team12.jar

   c. Double click on team12.jar to run the jar file or open terminal and execute the "java -jar team12.jar" from the folder where you have these files.

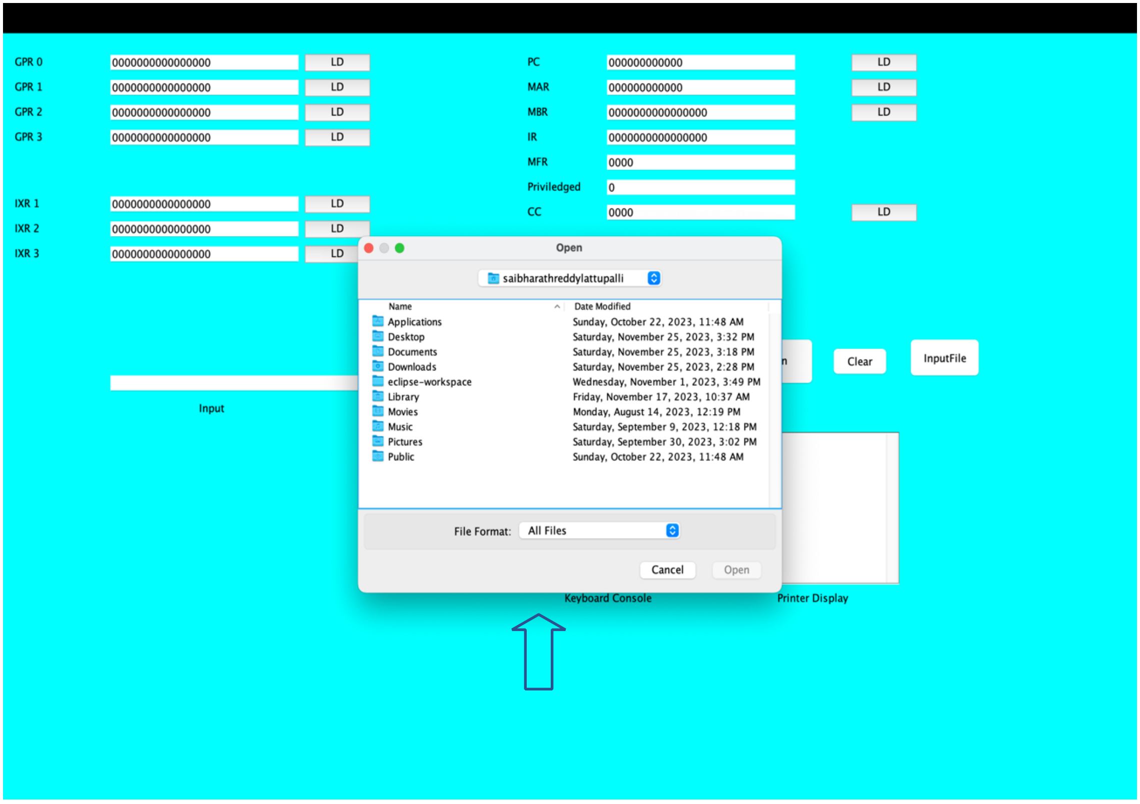
4. **Updates in this Project Phase 3:**
As continuation from part2, in this phase we have implemented all Instructions and added "Keyboard" and "Printer" consoles to the UI. Now the assembler will take a file with instructions from the user and convert its contents to hexadecimal format and then decodes those instructions.

5. **Operating the simulator:**
   a. Click on "InputFile" button. A popup will appear asking the user to select their intended file.



GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000
IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000

PC 000000000000
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000



GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000
IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000

PC 000000000000
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000

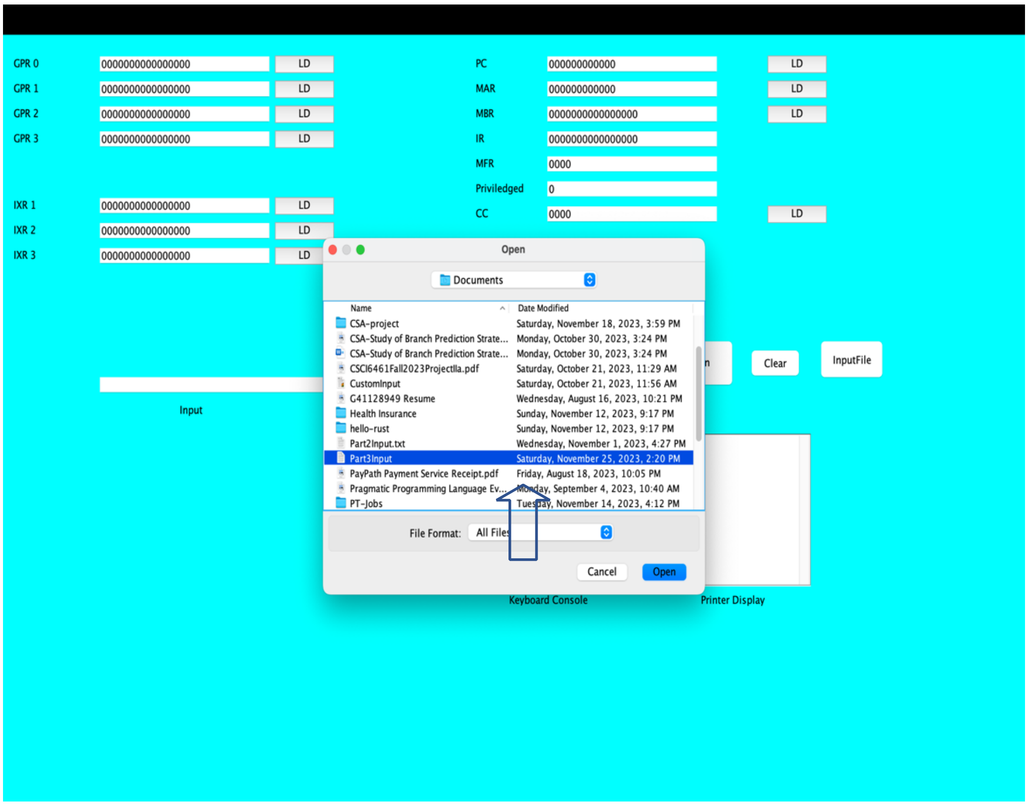
Open

saibharathreddylattupalli

Name	Date Modified
Applications	Sunday, October 22, 2023, 11:48 AM
Desktop	Saturday, November 25, 2023, 3:32 PM
Documents	Saturday, November 25, 2023, 3:18 PM
Downloads	Saturday, November 25, 2023, 2:28 PM
eclipse-workspace	Wednesday, November 1, 2023, 3:49 PM
Library	Friday, November 17, 2023, 10:37 AM
Movies	Monday, August 14, 2023, 12:19 PM
Music	Saturday, September 9, 2023, 12:18 PM
Pictures	Saturday, September 30, 2023, 3:02 PM
Public	Sunday, October 22, 2023, 11:48 AM

File Format: All Files

b. Select the input file “Part3Input” and then click on open.



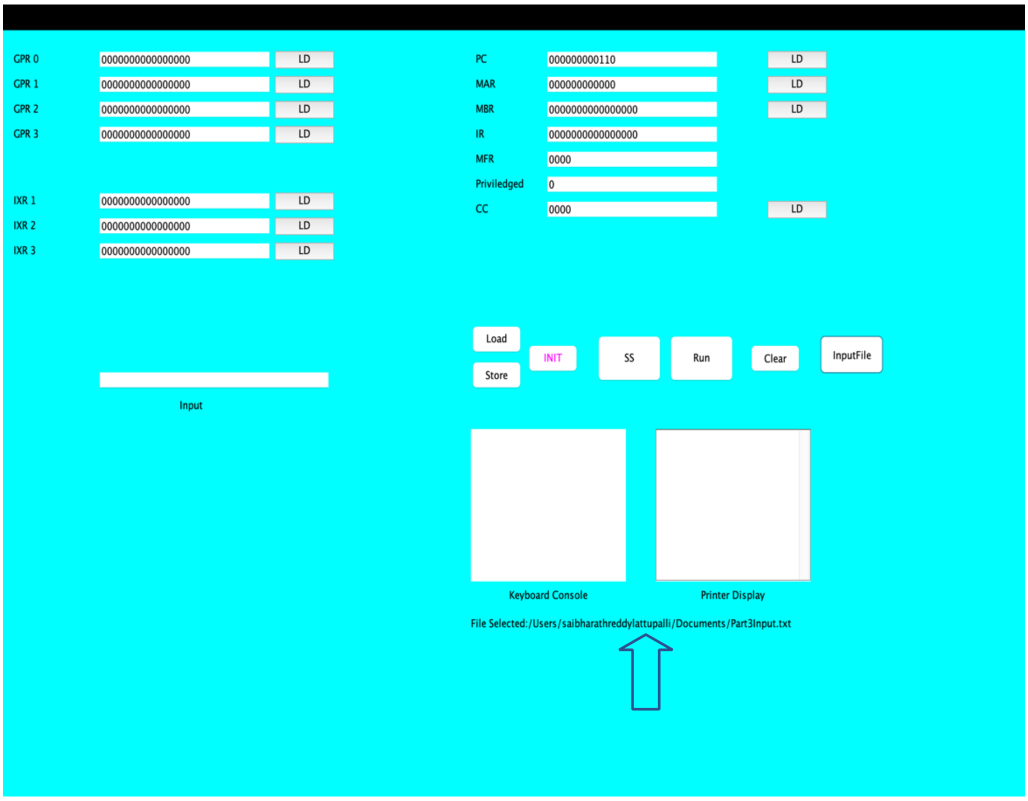
GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000
IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000
PC 000000000000
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000

Documents

Name	Date Modified
CSA-project	Saturday, November 18, 2023, 3:59 PM
CSA-Study of Branch Prediction Strate...	Monday, October 30, 2023, 3:24 PM
CSA-Study of Branch Prediction Strate...	Monday, October 30, 2023, 3:24 PM
CSCI6461Fall2023ProjectIIa.pdf	Saturday, October 21, 2023, 11:29 AM
CustomInput	Saturday, October 21, 2023, 11:56 AM
G41128949 Resume	Wednesday, August 16, 2023, 10:21 PM
Health Insurance	Sunday, November 12, 2023, 9:17 PM
hello-rust	Sunday, November 12, 2023, 9:17 PM
Part2Input.txt	Wednesday, November 1, 2023, 4:27 PM
Part3Input	Saturday, November 25, 2023, 2:20 PM
PayPath Payment Service Receipt.pdf	Friday, August 18, 2023, 10:05 PM
Pragmatic Programming Language Ev...	Monday, September 4, 2023, 10:40 AM
PT-Jobs	Tuesday, November 14, 2023, 4:12 PM

File Format: All Files

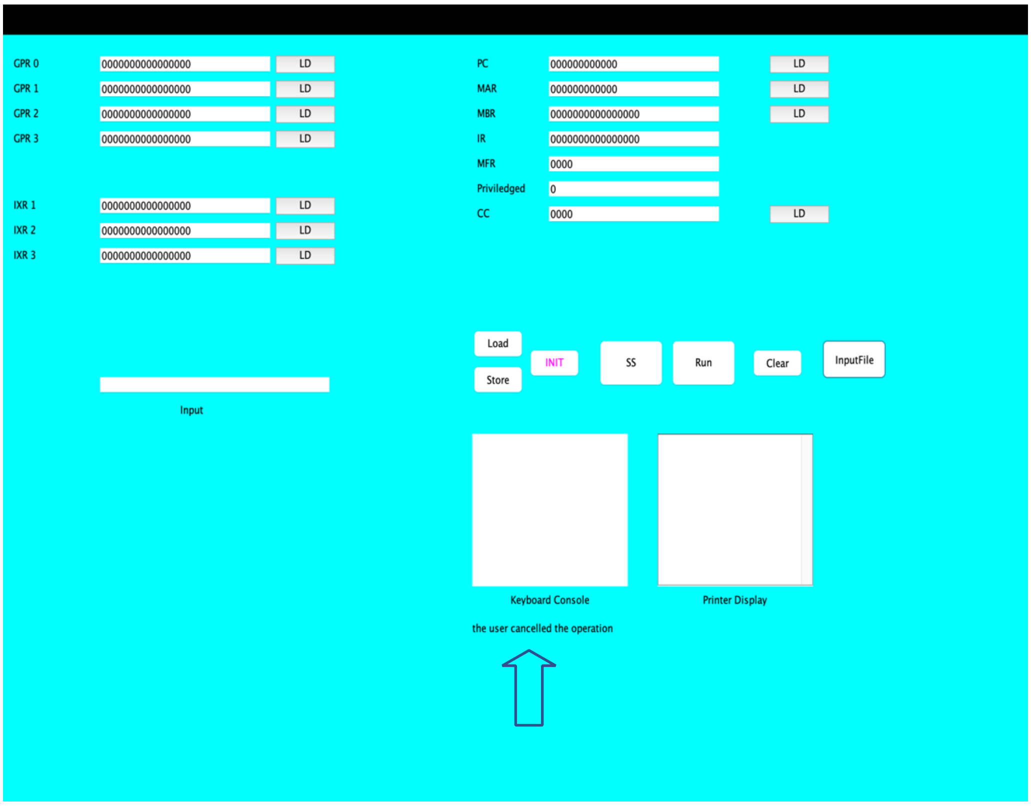
c. If file is selected successfully then the absolute path of the selected file will be displayed on the UI.



GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000
IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000
PC 000000000110
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000

File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

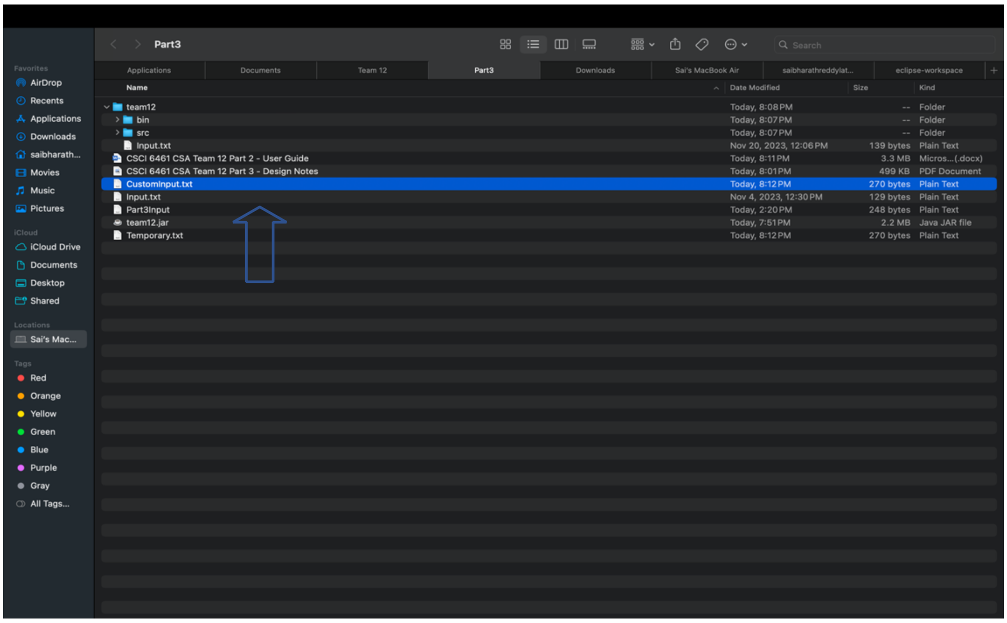
d. Else, if user selected “Cancel” in step 2, the message “The user cancelled the operation” will be displayed on the UI.



GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000
IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000
PC 000000000000
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000

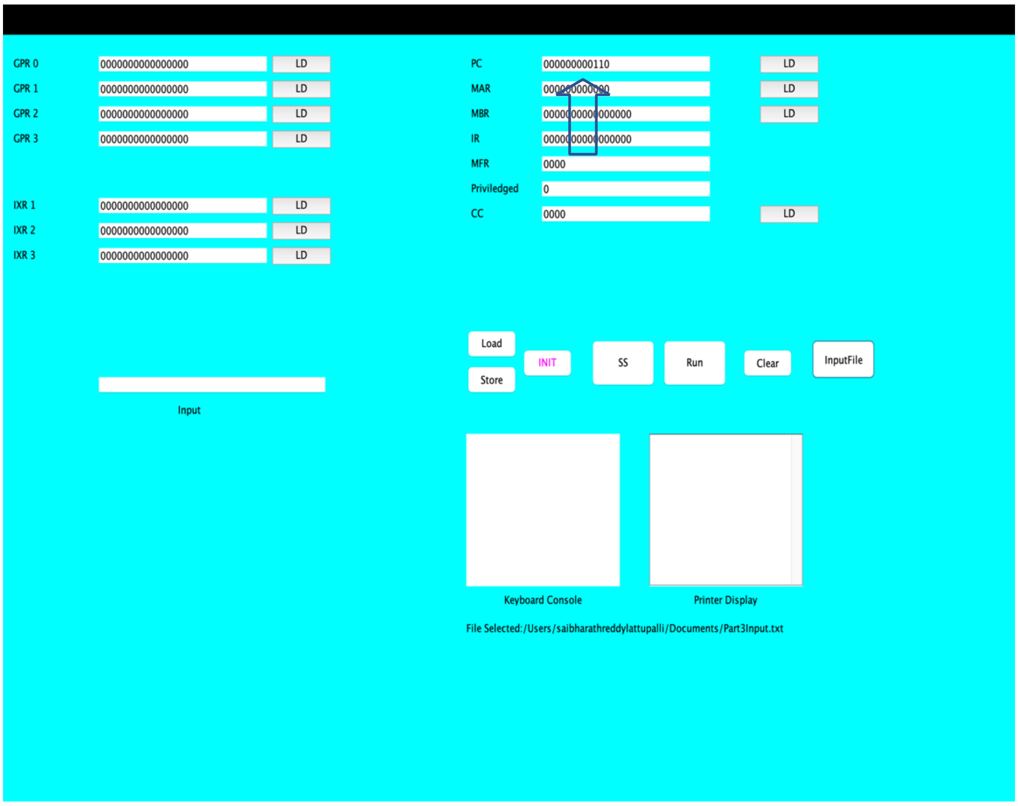
the user cancelled the operation

e. If file is selected successfully, then the content of the file will be converted to hexadecimal format and will be written to a new file “CustomInput.txt” and the first address in this file will be displayed at “PC”.



Part3

Name	Date Modified	Size	Kind
team12	Today, 8:08 PM	--	Folder
bin	Today, 8:07 PM	--	Folder
src	Today, 8:07 PM	--	Folder
Input.txt	Nov 20, 2023, 12:06 PM	139 bytes	Plain Text
CSCI 6461 CSA Team 12 Part 2 - User Guide	Today, 8:11 PM	3.3 MB	Micros...(.docx)
CSCI 6461 CSA Team 12 Part 3 - Design Notes	Today, 8:01 PM	499 KB	PDF Document
CustomInput.txt	Today, 8:12 PM	270 bytes	Plain Text
Input.txt	Nov 4, 2023, 12:30 PM	129 bytes	Plain Text
Part3Input	Today, 2:20 PM	248 bytes	Plain Text
team12.jar	Today, 7:51 PM	2.2 MB	Java JAR file
Temporary.txt	Today, 8:12 PM	270 bytes	Plain Text



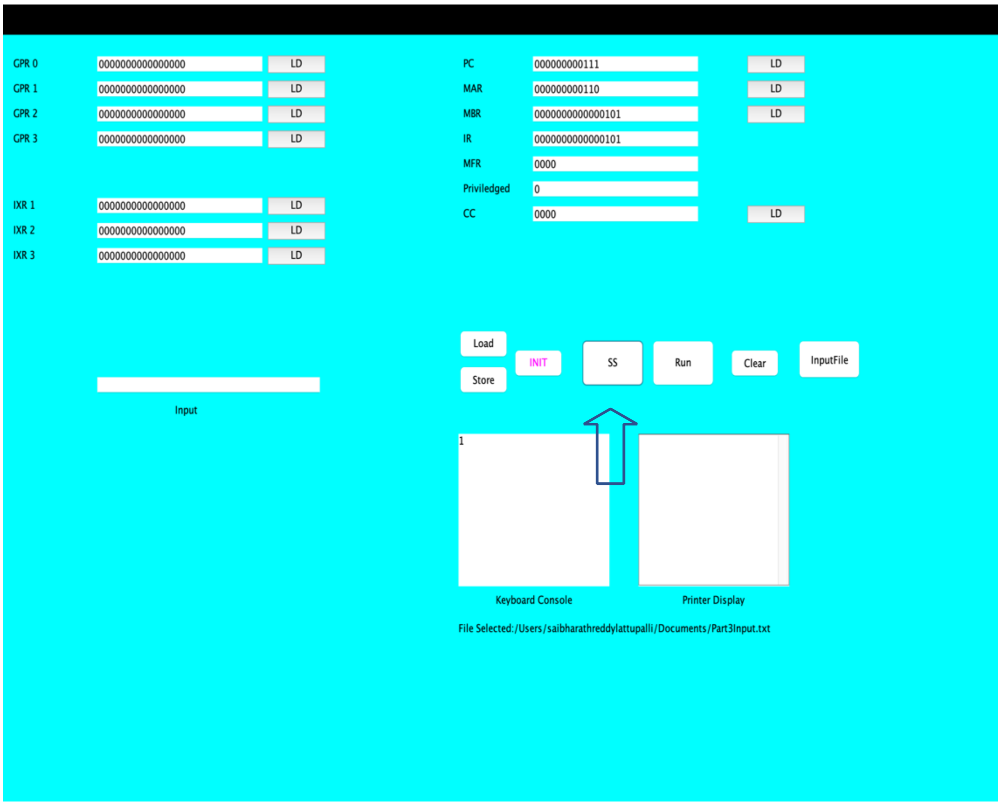
GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000

IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000

PC 000000000110
MAR 000000000000
MBR 0000000000000000
IR 0000000000000000
MFR 0000
Priviledged 0
CC 0000

File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

f. Click on “SS” to execute the instructions single step at a time.



GPR 0 0000000000000000
GPR 1 0000000000000000
GPR 2 0000000000000000
GPR 3 0000000000000000

IXR 1 0000000000000000
IXR 2 0000000000000000
IXR 3 0000000000000000

PC 000000000111
MAR 000000000110
MBR 0000000000000101
IR 0000000000000101
MFR 0000
Priviledged 0
CC 0000

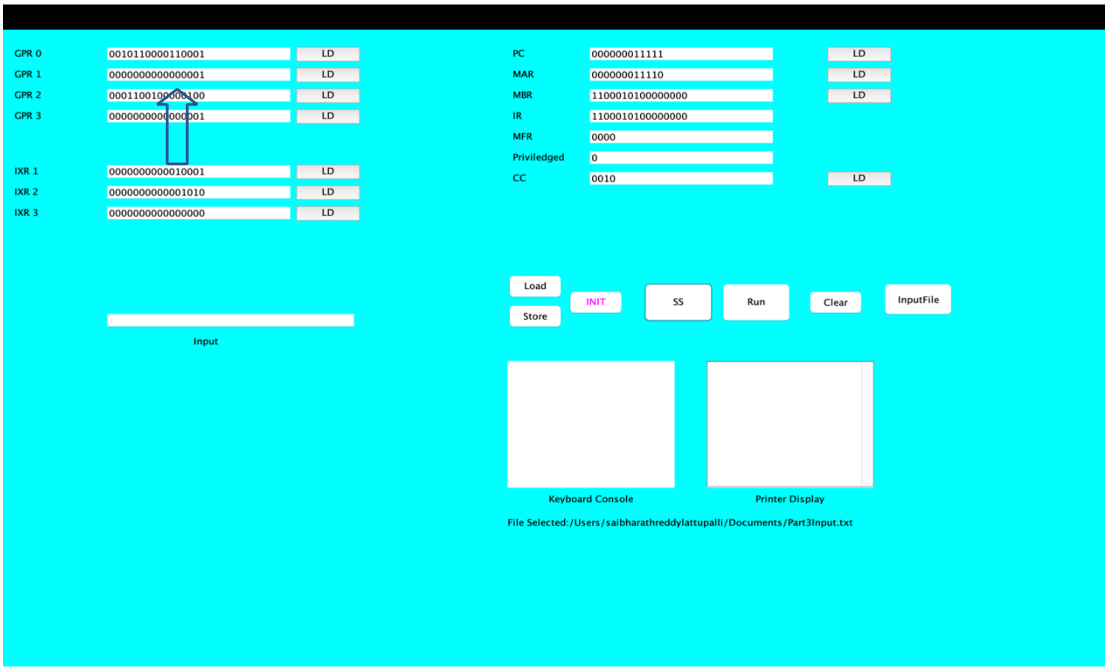
Keyboard Console: 1

File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

g. To execute “IN” and “OUT” instructions use “Keyboard Console” and “Printer Display”.

While executing “IN”, give a number into the “Keyboard Console”. This number will get stored into the register mentioned in the Instruction.

E.g.: IN 1,0 – This will store the number into GPR1.



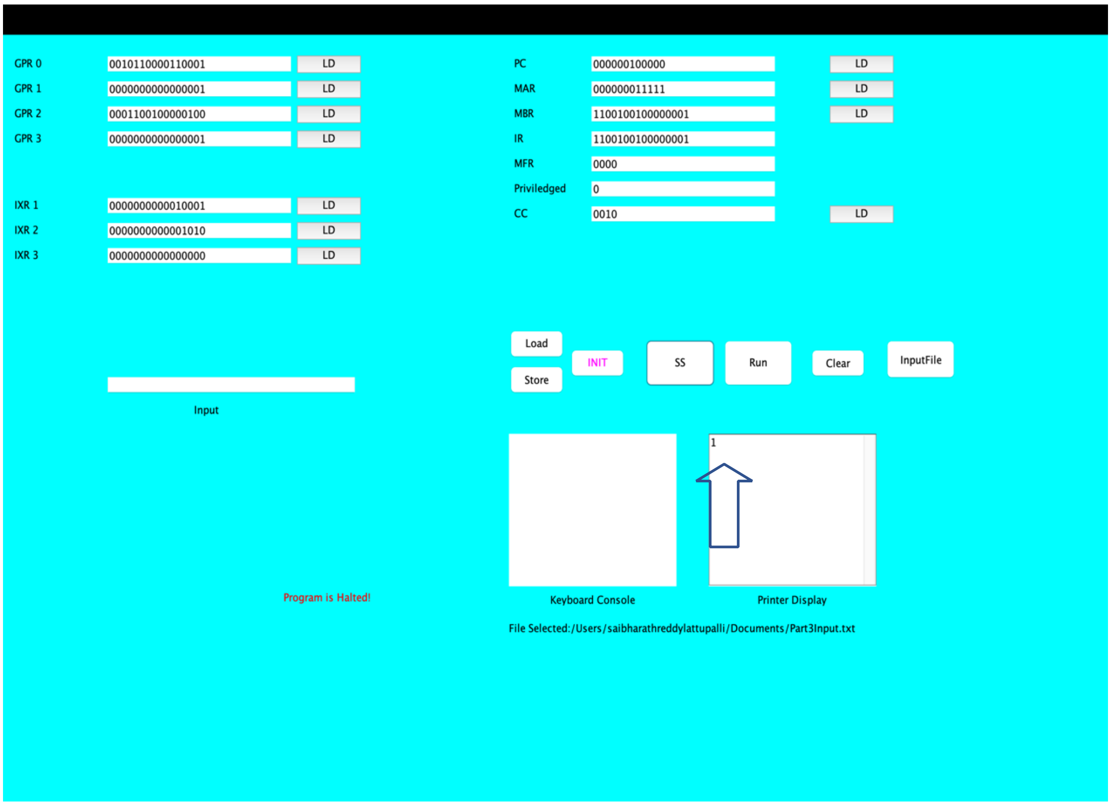
GPR 0 0010110000110001
GPR 1 0000000000000001
GPR 2 0001100100000100
GPR 3 0000000000000001
IXR 1 0000000000010001
IXR 2 0000000000001010
IXR 3 0000000000000000

PC 000000011111
MAR 000000011110
MBR 1100010100000000
IR 1100010100000000
MFR 0000
Priviledged 0
CC 0010

File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

The “OUT” instruction will read the value from the register specified in the instruction and displays it in “Printer Display”.

E.g.: OUT 1,1 – This will read the value from gpr1 and displays.



GPR 0 0010110000110001
GPR 1 0000000000000001
GPR 2 0001100100000100
GPR 3 0000000000000001
IXR 1 0000000000010001
IXR 2 0000000000001010
IXR 3 0000000000000000

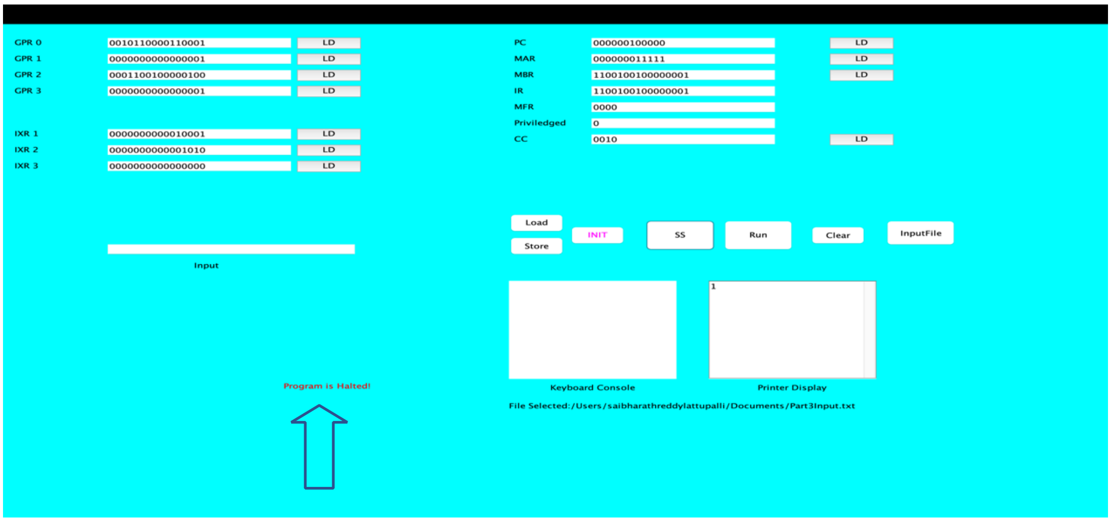
PC 000000100000
MAR 000000011111
MBR 1100100100000001
IR 1100100100000001
MFR 0000
Priviledged 0
CC 0010

Program is Halted!

1

File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

h. Once all the instructions from the memory are executed, “Program is Halted” gets displayed on the UI.



GPR 0 0010110000110001
GPR 1 0000000000000001
GPR 2 0001100100000100
GPR 3 0000000000000001

IXR 1 0000000000010001
IXR 2 0000000000001010
IXR 3 0000000000000000

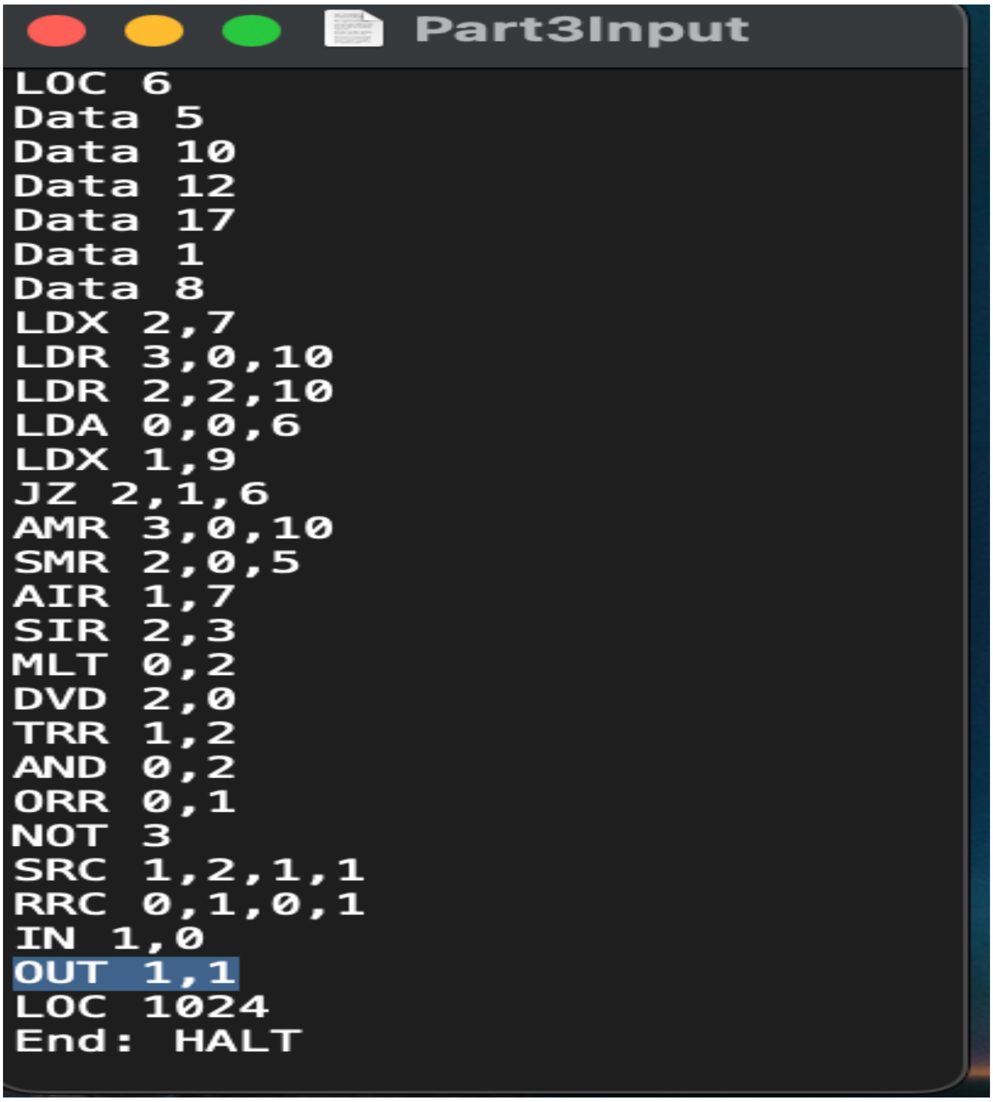
PC 000000100000
MAR 000000011111
MBR 1100100100000001
IR 1100100100000001
MFR 0000
Priviledged 0
CC 0010

Printer Display: 1

Program is Halted!

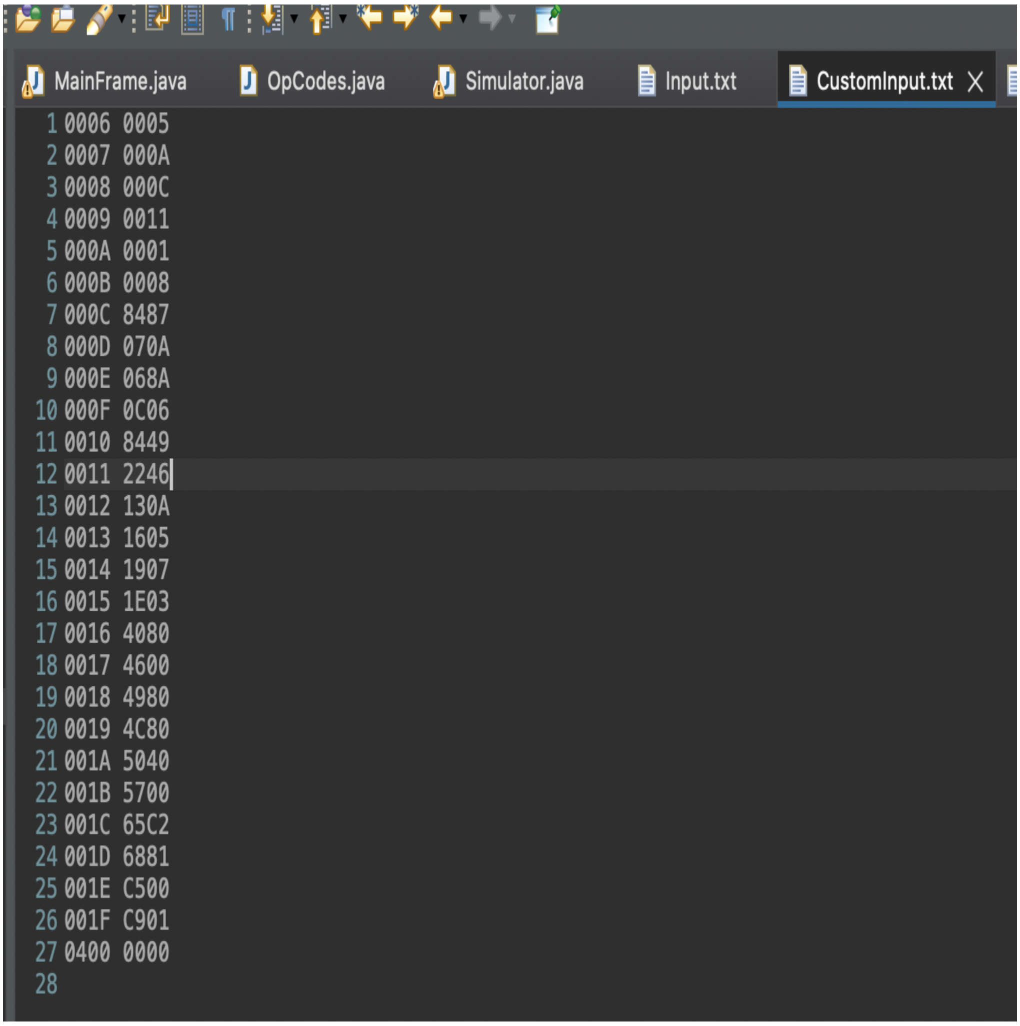
File Selected:/Users/saibharathreddylattupalli/Documents/Part3Input.txt

i. Content of “Part3Input” (User File)



```
LOC 6
Data 5
Data 10
Data 12
Data 17
Data 1
Data 8
LDX 2,7
LDR 3,0,10
LDR 2,2,10
LDA 0,0,6
LDX 1,9
JZ 2,1,6
AMR 3,0,10
SMR 2,0,5
AIR 1,7
SIR 2,3
MLT 0,2
DVD 2,0
TRR 1,2
AND 0,2
ORR 0,1
NOT 3
SRC 1,2,1,1
RRC 0,1,0,1
IN 1,0
OUT 1,1
LOC 1024
End: HALT
```

j. Content of “CustomInput.txt” (Generated File)



```
0006 0005
0007 000A
0008 000C
0009 0011
000A 0001
000B 0008
000C 8487
000D 070A
000E 068A
000F 0C06
0010 8449
0011 2246
0012 130A
0013 1605
0014 1907
0015 1E03
0016 4080
0017 4600
0018 4980
0019 4C80
001A 5040
001B 5700
001C 65C2
001D 6881
001E C500
001F C901
0400 0000
```