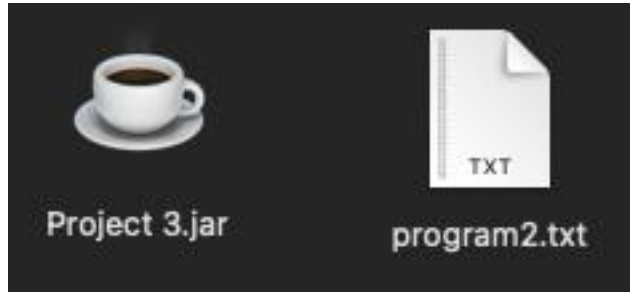


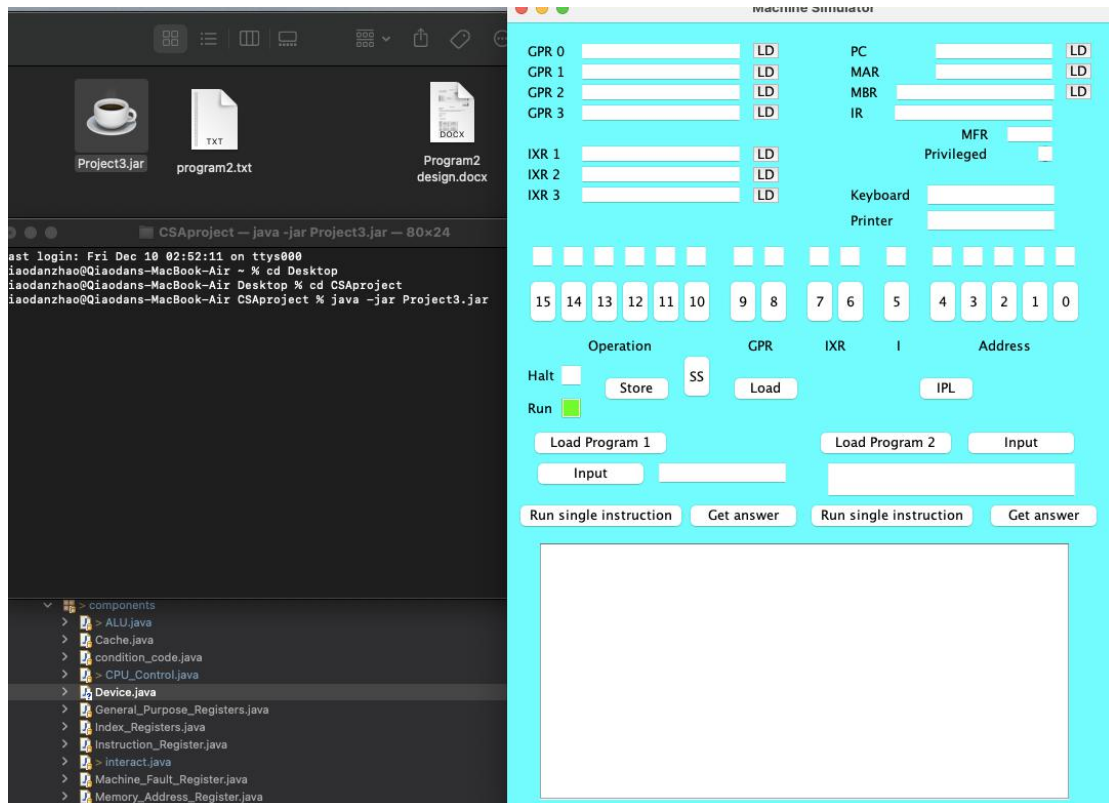
User Guide

1. Start machine

- 1) put the Project3.jar and program2.txt in the same folder



- 2) Open the terminal and go to the folder consisting Project3.jar and program2.txt and use terminal command line "java -jar Project3.jar" to start. (Double click will not work)



- 3) press Load Program 2 button to start and load the program2.txt to memory.

The image shows a 'Machine Simulator' window with a light blue background. At the top, there are three colored window control buttons (red, yellow, green). The title bar reads 'Machine Simulator'.

Registers and Memory:

- GPR 0:** 0 **LD**
- GPR 1:** 0 **LD**
- GPR 2:** 0 **LD**
- GPR 3:** 0 **LD**
- PC:** 1000 **LD**
- MAR:** 0 **LD**
- MBR:** 0 **LD**
- IR:** 0 **LD**
- IXR 1:** 0 **LD**
- IXR 2:** 1100100 **LD**
- IXR 3:** 1111101000 **LD**
- MFR:** 0
- Privileged:** ☐

Input/Output:

- Keyboard:**
- Printer:**

Memory Address Display:

A row of 16 small square indicators, each with a number below it: 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.

Operation and Control Buttons:

- Operation:** Halt ☐ Store SS Load IPL
- Run:** ☒
- Buttons:** Load Program 1 **Load Program 2** Input
- Bottom Row:** Run single instruction Get answer Run single instruction Get answer

Text Area:

Now the program2 has been loaded to the memory.
Please write 6 sentences in the textfield above the input button and press input button
then write the target word to compare and detect the word in sentences and its location

The 'Load Program 2' button is highlighted with a red rectangular box.

2. Run program 1

1) Please paste 6 sentences in the box near program2's buttons, and click input button, the program2 will run the trap 1 to read 6 sentences.(The sentence should only consist letters, space and '.')

The image shows a 'Machine Simulator' window with a light blue background. At the top, there are three colored window control buttons (red, yellow, green). Below them, the title 'Machine Simulator' is centered. The interface is divided into several sections:

- Registers:** On the left, there are four General Purpose Registers (GPR 0 to GPR 3) and three Instruction Registers (IXR 1 to IXR 3). Each register has a value field and a 'LD' button. On the right, there are four more registers: PC, MAR, MBR, and IR, each with a value field and a 'LD' button. Below these are 'MFR' (set to 0) and a 'Privileged' checkbox.
- Input/Output:** Below the registers, there are 'Keyboard' (set to 46) and 'Printer' (set to 0) fields.
- Operation Buttons:** In the center, there are buttons for 'Halt', 'Run' (with a green indicator), 'Store', 'SS', 'Load', and 'IPL'. Above these buttons are labels for 'Operation', 'GPR', 'IXR', 'I', and 'Address'.
- Program Buttons:** Below the operation buttons, there are 'Load Program 1', 'Load Program 2', and 'Input' buttons. The 'Input' button is highlighted with a red rectangle.
- Text Input Area:** Below the 'Input' button, there is a text input field containing the text 'S2. I am S3. I am S4. I am S5. I am S6.'. This area is also highlighted with a red rectangle.
- Execution Log:** At the bottom, there is a scrollable text area showing the execution log. It lists instructions and the corresponding PC values. Below the log, there is a message: 'Now the memory has 6 sentences(part of them is showing below): I am S1.I am S2.I am S3.I am S4.I am S5.I Address2: 1148 Address4: 2000'. At the very bottom, there is a prompt: 'Please input another word to compare and detect in these sentences'.

2) After inputting 6 sentences, delete sentences in the box and write the target word to compare and detect in these sentences (also with the input button and the same box). The program 2 will use the trap 2 to read it.

Machine Simulator

GPR 0

GPR 1

GPR 2

GPR 3

IXR 1

IXR 2

IXR 3

PC

MAR

MBR

IR

MFR

Privileged ☐

Keyboard

Printer

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Operation

GPR IXR I Address

execute the instruction 110100000001, then the PC is 415

execute the instruction 101011000110, then the PC is 416

execute the instruction 1001000010000000, then the PC is 417

execute the instruction 10101100000010, then the PC is 418

execute the instruction 10110001000100, then the PC is 412

execute the instruction 1100010100000000, then the PC is 413

execute the instruction 100111100110, then the PC is 414

execute the instruction 1101000000001, then the PC is 415

execute the instruction 101011000110, then the PC is 416

execute the instruction 1001000010000000, then the PC is 417

execute the instruction 10101100000010, then the PC is 10

Now the memory has the target word:

S3

Address2: 1148 Address4: 2002

3) After inputting the target word, please click the button Run single instruction to run instructions one by one, but it may take thousands times.

So click button Get answer to get the result directly. (It may cost a long time to run if the sentences are long)

Machine Simulator

GPR 0

GPR 1

GPR 2

GPR 3

IXR 1

IXR 2

IXR 3

PC

MAR

MBR

IR

MFR

Privileged ☐

Keyboard

Printer

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

0

Operation
GPR
IXR
I
Address

Halt ☐
Store
Load
IPL

Run ☒

Load Program 1
Load Program 2
Input

Input

Run single instruction
Get answer
Run single instruction
Get answer

Address2: 1140 Address4: 2002
 pointer2: 1122 pointer1: 2002
 Sentence number: 3 Word number: 3
 letter of pointer2: 3 letter of pointer1:

execute the instruction 11011001010, then the PC is 121
 Address2: 1148 Address4: 2002
 pointer2: 1122 pointer1: 2002
 Sentence number: 3 Word number: 3
 letter of pointer2: 3 letter of pointer1:

The word has been found.
 Please click the Run single instruction button for three times
 to output the result to the Printer(1--which means word has been found)
 and the sentence number and the word number location

4) Then click the run single instruction button to run the OUT instruction. The result will be in the device1(printer) . If the word has been found, the result will be 1, Sentence location and word location. Else it will only output 0.

Machine Simulator

<table border="0" style="width: 100%;"> <tr><td>GPR 0</td><td><input type="text" value="1"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>GPR 1</td><td><input type="text" value="11"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>GPR 2</td><td><input type="text" value="11"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>GPR 3</td><td><input type="text" value="101110"/></td><td><input type="button" value="LD"/></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>IXR 1</td><td><input type="text" value="110010000"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>IXR 2</td><td><input type="text" value="1100100"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>IXR 3</td><td><input type="text" value="1111101000"/></td><td><input type="button" value="LD"/></td></tr> </table>	GPR 0	<input type="text" value="1"/>	<input type="button" value="LD"/>	GPR 1	<input type="text" value="11"/>	<input type="button" value="LD"/>	GPR 2	<input type="text" value="11"/>	<input type="button" value="LD"/>	GPR 3	<input type="text" value="101110"/>	<input type="button" value="LD"/>				IXR 1	<input type="text" value="110010000"/>	<input type="button" value="LD"/>	IXR 2	<input type="text" value="1100100"/>	<input type="button" value="LD"/>	IXR 3	<input type="text" value="1111101000"/>	<input type="button" value="LD"/>	<table border="0" style="width: 100%;"> <tr><td>PC</td><td><input type="text" value="1111100"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>MAR</td><td><input type="text" value="1110011"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>MBR</td><td><input type="text" value="1100101000000001"/></td><td><input type="button" value="LD"/></td></tr> <tr><td>IR</td><td colspan="2"><input type="text" value="1100101000000001"/></td></tr> <tr><td>MFR</td><td><input type="text" value="0"/></td><td></td></tr> <tr><td>Privileged</td><td colspan="2"><input type="checkbox"/></td></tr> <tr><td colspan="3"> </td></tr> <tr><td>Keyboard</td><td><input type="text" value="32"/></td><td></td></tr> <tr><td>Printer</td><td><input type="text" value="3"/></td><td></td></tr> </table>	PC	<input type="text" value="1111100"/>	<input type="button" value="LD"/>	MAR	<input type="text" value="1110011"/>	<input type="button" value="LD"/>	MBR	<input type="text" value="1100101000000001"/>	<input type="button" value="LD"/>	IR	<input type="text" value="1100101000000001"/>		MFR	<input type="text" value="0"/>		Privileged	<input type="checkbox"/>					Keyboard	<input type="text" value="32"/>		Printer	<input type="text" value="3"/>	
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☐ 15 ☐ 14 ☐ 13 ☐ 12 ☐ 11 ☐ 10 ☐ 9 ☐ 8 ☐ 7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0

Operation
GPR
IXR
I
Address

Halt ☐
Store
Load

Run ☒

letter of pointer2: 3 letter of pointer1:

execute the instruction 11011001010, then the PC is 121

Address2: 1148 Address4: 2002

pointer2: 1122 pointer1: 2002

Sentence number: 3 Word number: 3

letter of pointer2: 3 letter of pointer1:

The word has been found.

Please click the Run single instruction button for three times to output the result to the Printer(1--which means word has been found) and the sentence number and the word number location

execute the instruction 1100100000000001, then the PC is 122

execute the instruction 1100100100000001, then the PC is 123

execute the instruction 1100101000000001, then the PC is 124