SIC - ASSEMBLER - SIMULATOR

Prerequisites

You need to have JAVA installed in your machine. This is the easiest version. First update the package index.

```
$ sudo apt-get update
```

Then check if java is intalled or not.

```
$ java -version
```

If it returns “The program java can be found in the following packages”, Java hasn’t been installed yet, so execute the following command:

```
$ sudo apt-get install default-jre
$ sudo apt-get install default-jdk
```

That is everything you need to install Java.

Run the simulator

First get into the folder SIC-Assembler-Simulator :

```
cd SIC-Assembler-Simulator/
```

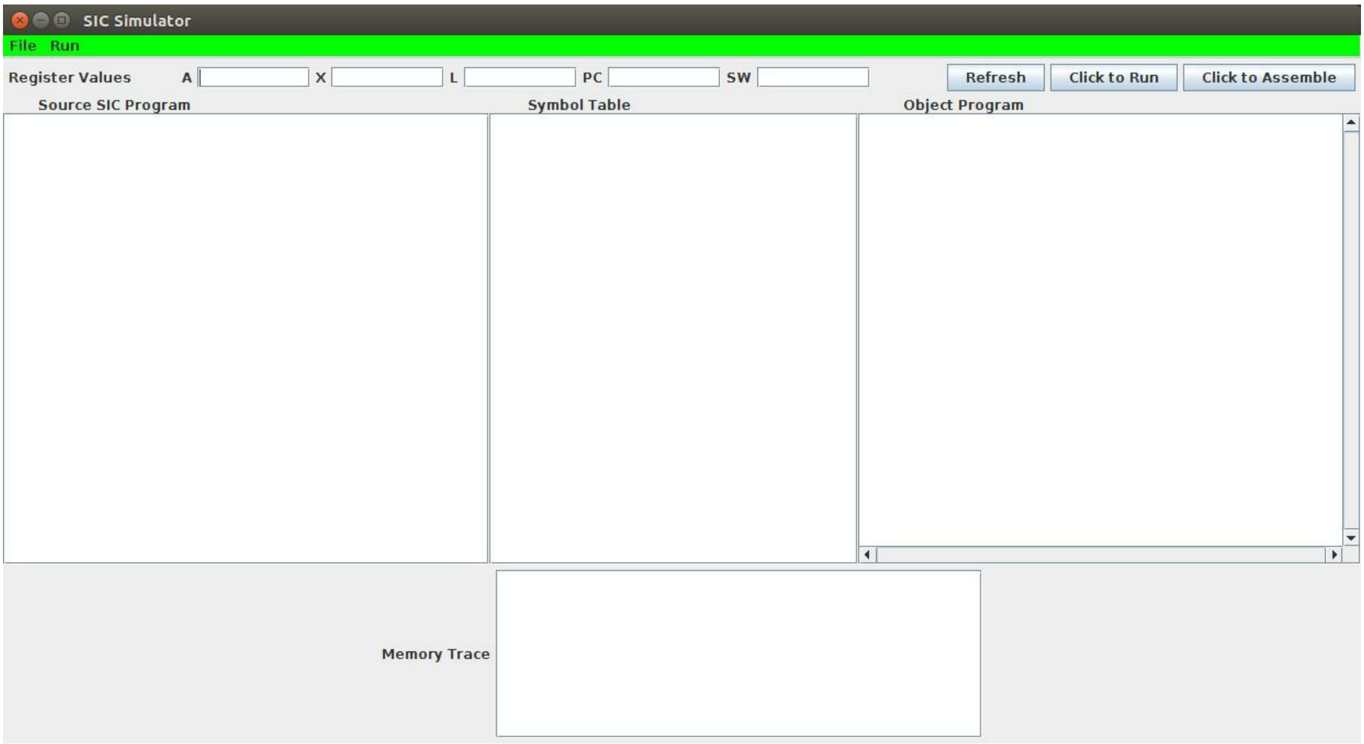
Now compile the program :

```
javac UI.java
```

Run the compiled program :

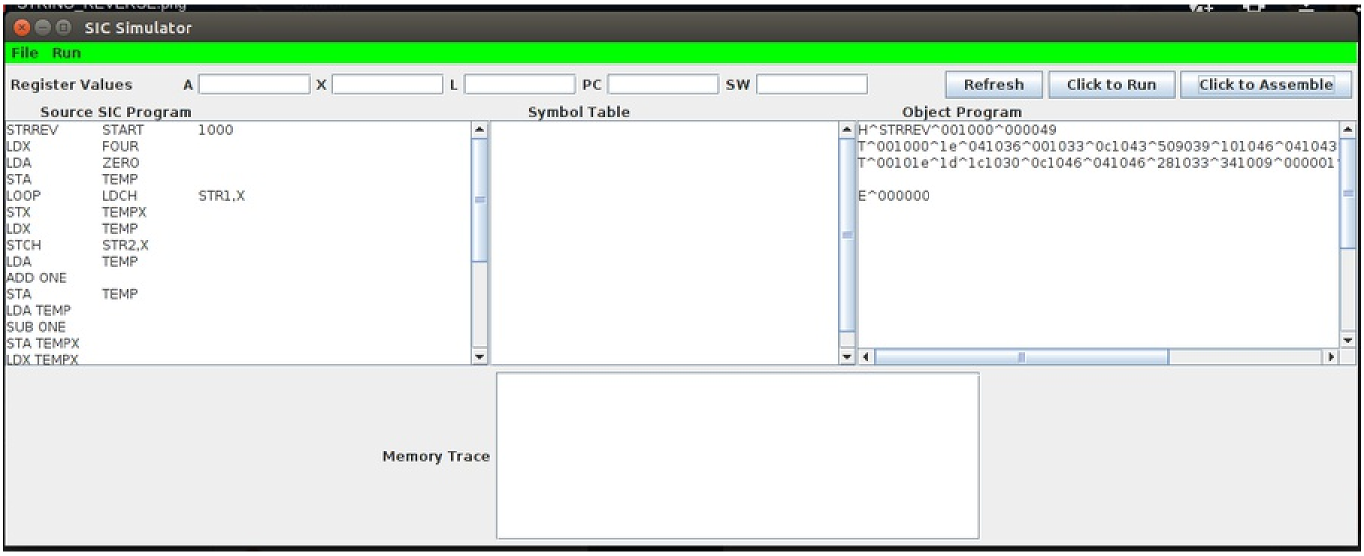
```
java UI
```

You will notice the following dialog box come up :



Enter your SIC code in the ***Source SIC Program*** box.

Then click on `Click to Assemble` button. After the program gets assembled you can see the Object Program as shown below :



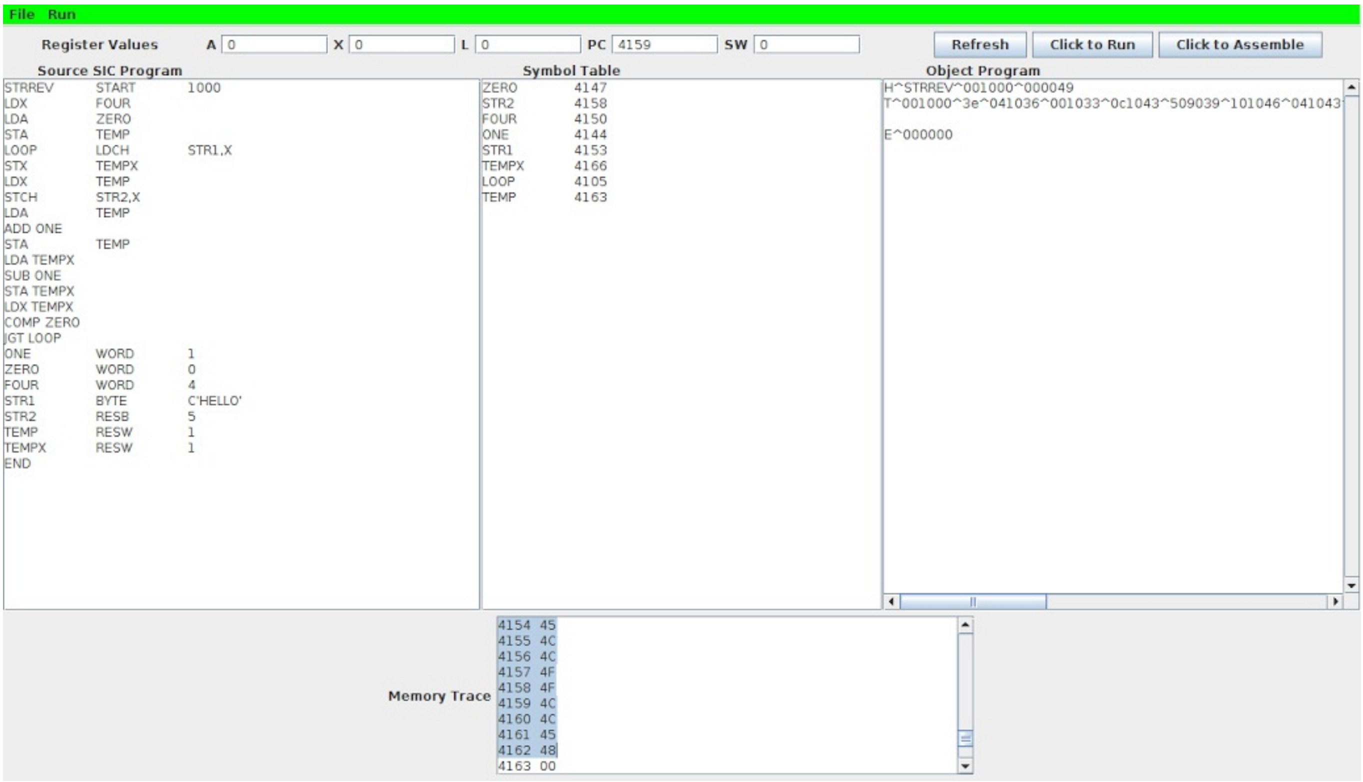
```
STRREV      START       1000
LDX         FOUR
LDA         ZERO
STA         TEMP
LOOP        LDCH        STR1,X
STX         TEMPX
LDX         TEMP
STCH        STR2,X
LDA         TEMP
ADD ONE
STA         TEMP
LDA TEMP
SUB ONE
STA TEMPX
LDX TEMPX
```

```
H^STRREV^001000^000049
T^001000^1e^041036^001033^0c1043^509039^101046^041043
T^00101e^1d^1c1030^0c1046^041046^281033^341009^000001

E^000000
```

Now click on `Click to Run` button.

You will get something like below as output if your SIC program is correct :



A 0 X 0 L 0 PC 4159 SW 0

```
STRREV      START       1000
LDX         FOUR
LDA         ZERO
STA         TEMP
LOOP        LDCH        STR1,X
STX         TEMPX
LDX         TEMP
STCH        STR2,X
LDA         TEMP
ADD ONE
STA         TEMP
LDA TEMPX
SUB ONE
STA TEMPX
LDX TEMPX
COMP ZERO
JGT LOOP
ONE         WORD        1
ZERO        WORD        0
FOUR        WORD        4
STR1        BYTE        C'HELLO'
STR2        RESB        5
TEMP        RESW        1
TEMPX       RESW        1
END
```

ZERO	4147
STR2	4158
FOUR	4150
ONE	4144
STR1	4153
TEMPX	4166
LOOP	4105
TEMP	4163

```
H^STRREV^001000^000049
T^001000^3e^041036^001033^0c1043^509039^101046^041043

E^000000
```

```
4154  45
4155  4C
4156  4C
4157  4F
4158  4F
4159  4C
4160  4C
4161  45
4162  48
4163  00
```

- `Register Values` gives us the value stored in the different registers.
- `Symbol Table` gives us the addresses assigned to labels.
- `Object Program` gives us the object program for the SIC-code.

- `Memory Trace` shows the value occupied in different memory locations.

File Architecture

```
├── ExecEngine.class
├── ExecEngine.java
├── logo.jpg
├── MyMenuBar.class
├── panel$1.class
├── panel$2.class
├── panel$3.class
├── panel$4.class
├── panel$5.class
├── panel$actlist.class
├── panel.class
├── panel$savelist.class
├── Readme.pdf
├── Read_problem.pdf
├── sicassem
│   ├── Assembler.class
│   ├── Assembler.java
│   ├── EndRecord.class
│   ├── EndRecord.java
│   ├── HeaderRecord.class
│   ├── HeaderRecord.java
│   ├── ObjectProg.class
│   ├── ObjectProg.java
│   ├── Optable.class
│   ├── Optable.java
│   ├── SymTab.class
│   ├── SymTab.java
│   ├── TextRecord.class
│   └── TextRecord.java
├── Test.class
├── Test.java
├── UI.class
└── UI.java
```

We can see that the `sicassem` folder contains the codes for the assembler while the root folder has the codes for the graphics user interface.

Feel free to contribute.