Experiment 2.4

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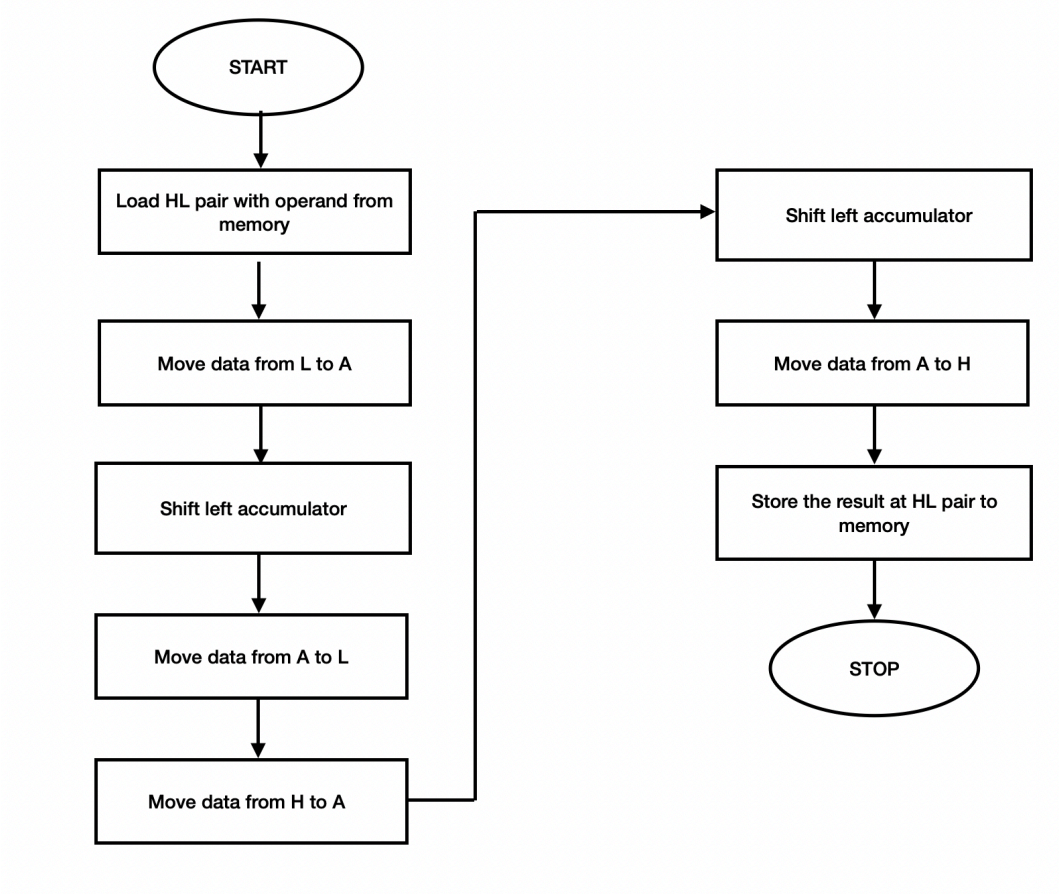
Branch: CSE **Section/Group:607A**
Semester: 4th **Date of Performance: 05/04/2022**
Subject Name:MPI Lab **Subject Code: 22E-20CSP-253**

1) **Aim/Overview of the practical:**

a) Shift left by 1 bit of 16bit number

Apparatus/Simulator used: 8085 simulator

Flowchart:


START
Load HL pair with operand from memory
Move data from L to A
Shift left accumulator
Move data from A to L
Move data from H to A
Shift left accumulator
Move data from A to H
Store the result at HL pair to memory
STOP

Algorithm:

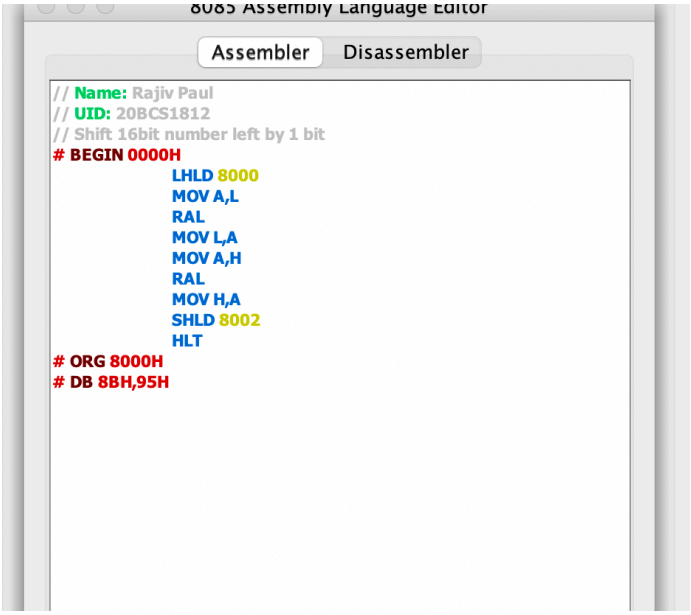
1. **LHLD 8000H loads H-L pair with data from 8000H memory location.**
2. **MOV A,L moves register L data to A.**
3. **RAL shifts 1bit to left of accumulator.**
4. **MOV L,A moves data from A to L**
5. **MOV A,H moves data from register H to A.**
6. **RAL shifts 1bit to left of accumulator.**
7. **MOV H,A moves data from A to H**
8. **SHLD 8002H stores result at the memory location 8002H.**
9. **HLT end of the execution.**

Steps for experiment/practical/Code:

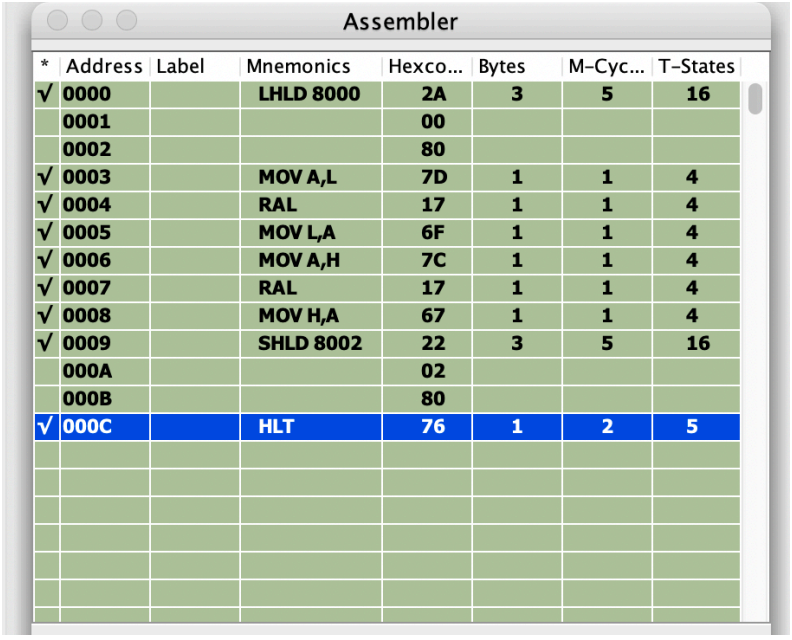
```
# BEGIN 0000H

LHLD 8000

MOV A,L

RAL

MOV L,A

MOV A,H

RAL

MOV H,A

SHLD 8002

HLT

# ORG 8000H

# DB 8BH,95H
```

Simulation:

1. CODE IN EDITOR WINDOW:

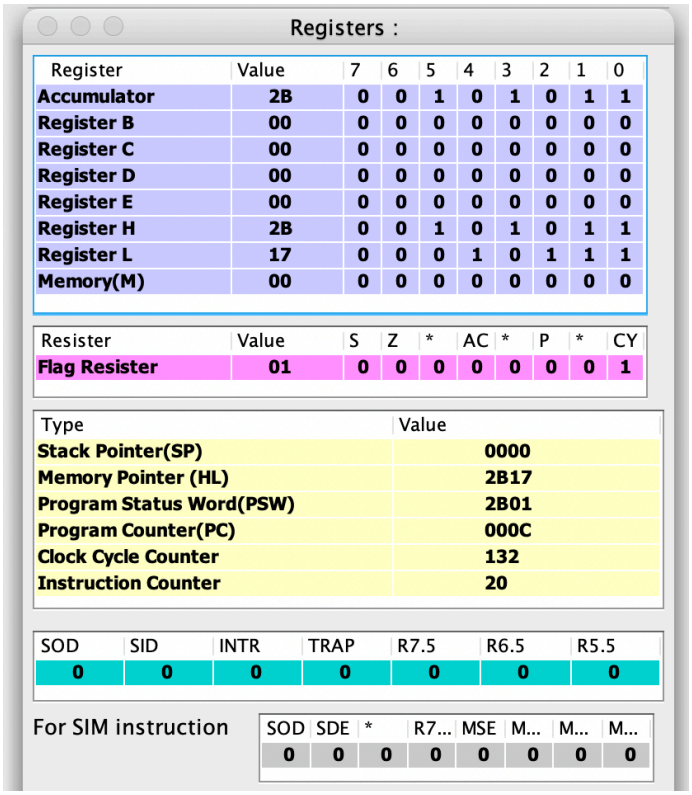


2. ASSEMBLER WINDOW:



*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
√	0000		LHLD 8000	2A	3	5	16
	0001			00			
	0002			80			
√	0003		MOV A,L	7D	1	1	4
√	0004		RAL	17	1	1	4
√	0005		MOV L,A	6F	1	1	4
√	0006		MOV A,H	7C	1	1	4
√	0007		RAL	17	1	1	4
√	0008		MOV H,A	67	1	1	4
√	0009		SHLD 8002	22	3	5	16
	000A			02			
	000B			80			
√	000C		HLT	76	1	2	5

3. REGISTERS:



Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	2B	0	0	1	0	1	0	1	1
Register B	00	0	0	0	0	0	0	0	0
Register C	00	0	0	0	0	0	0	0	0
Register D	00	0	0	0	0	0	0	0	0
Register E	00	0	0	0	0	0	0	0	0
Register H	2B	0	0	1	0	1	0	1	1
Register L	17	0	0	0	1	0	1	1	1
Memory(M)	00	0	0	0	0	0	0	0	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	01	0	0	0	0	0	0	0	1

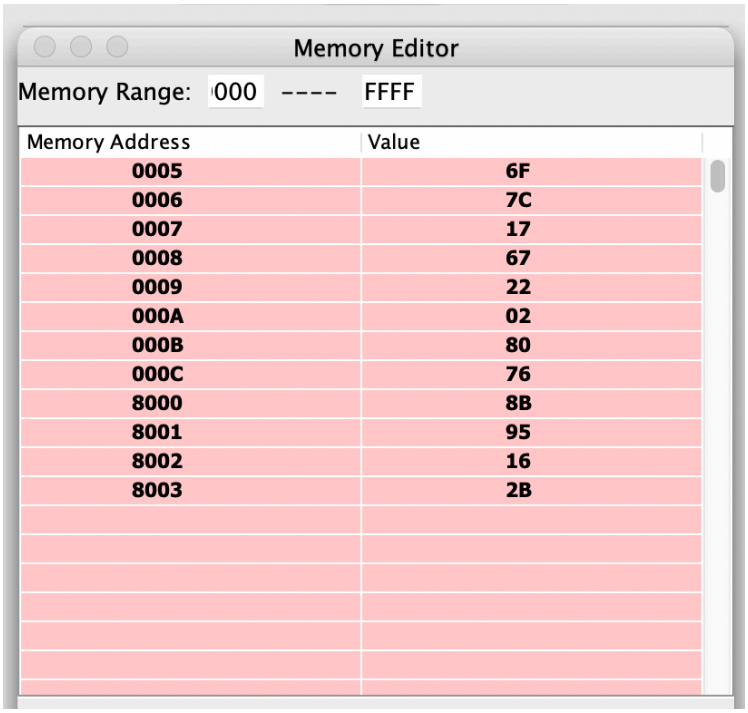
Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	2B17
Program Status Word(PSW)	2B01
Program Counter(PC)	000C
Clock Cycle Counter	132
Instruction Counter	20

SOD	SID	INTR	TRAP	R7.5	R6.5	R5.5
0	0	0	0	0	0	0

For SIM instruction

SOD	SDE	*	R7...	MSE	M...	M...	M...
0	0	0	0	0	0	0	0

4. MEMORY:


Memory Editor
Memory Range: 000 ---- FFFF
Memory Address
Value
0005 6F
0006 7C
0007 17
0008 67
0009 22
000A 02
000B 80
000C 76
8000 8B
8001 95
8002 16
8003 2B

RESULT

BEFORE EXECUTION:

8000H: 8BH
8001H: 95H

AFTER EXECUTION:

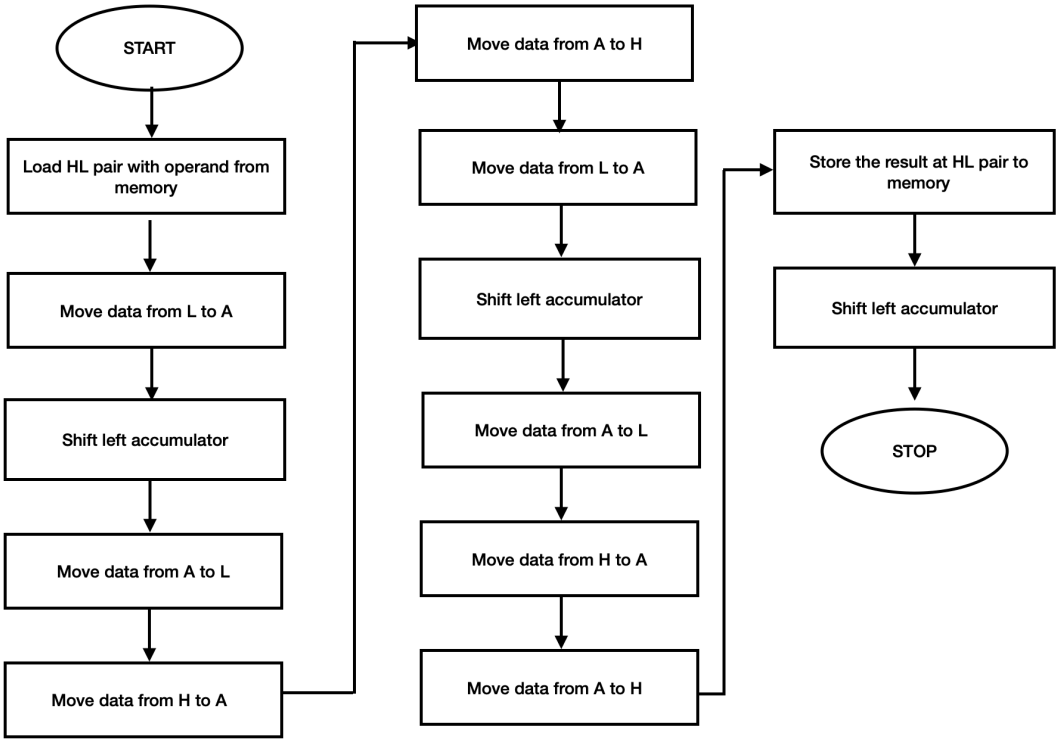
8002H: 16H
8003H: 2BH

Aim/Overview of the practical:

b) Shift left by 2 bit of 16bit number.

Apparatus/Simulator used: 8085 simulator

Flowchart:



Algorithm:

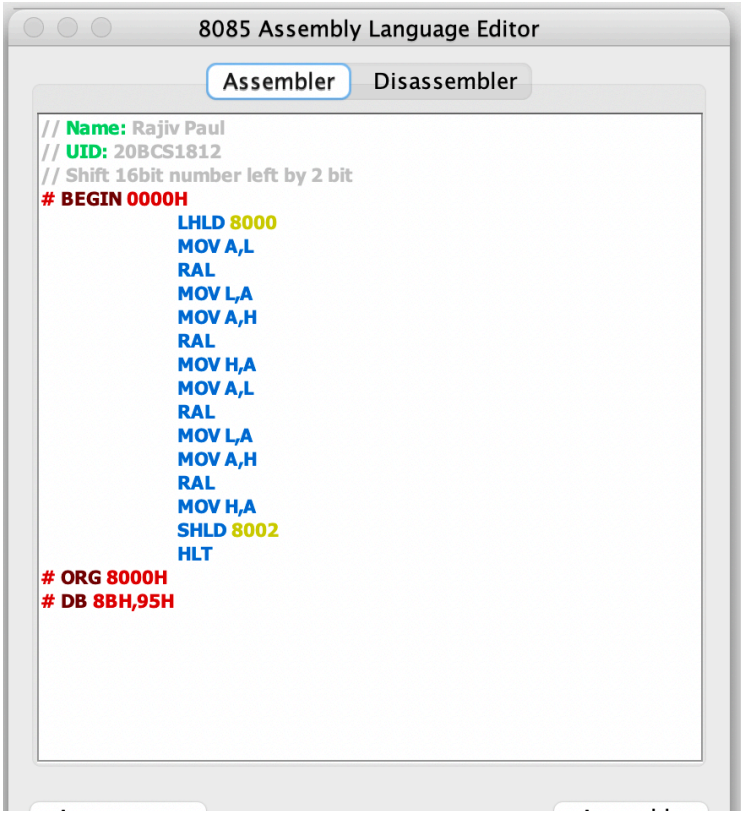
1. **LHLD 8000H loads H-L pair with data from 8000H memory location.**
2. **MOV A,L moves register L data to A.**
3. **RAL shifts 1bit to left of accumulator.**
4. **MOV L,A moves data from A to L**
5. **MOV A,H moves data from register H to A.**
6. **RAL shifts 1bit to left of accumulator.**
7. **MOV H,A moves data from A to H**
8. **MOV A,L moves register L data to A.**
9. **RAL shifts 1bit to left of accumulator.**
10. **MOV L,A moves data from A to L**
11. **MOV A,H moves data from register H to A.**
12. **RAL shifts 1bit to left of accumulator.**
13. **MOV H,A moves data from A to H**
14. **SHLD 8002H stores result at the memory location 8002H.**
15. **HLT end of the execution.**

Steps for experiment/practical/Code:

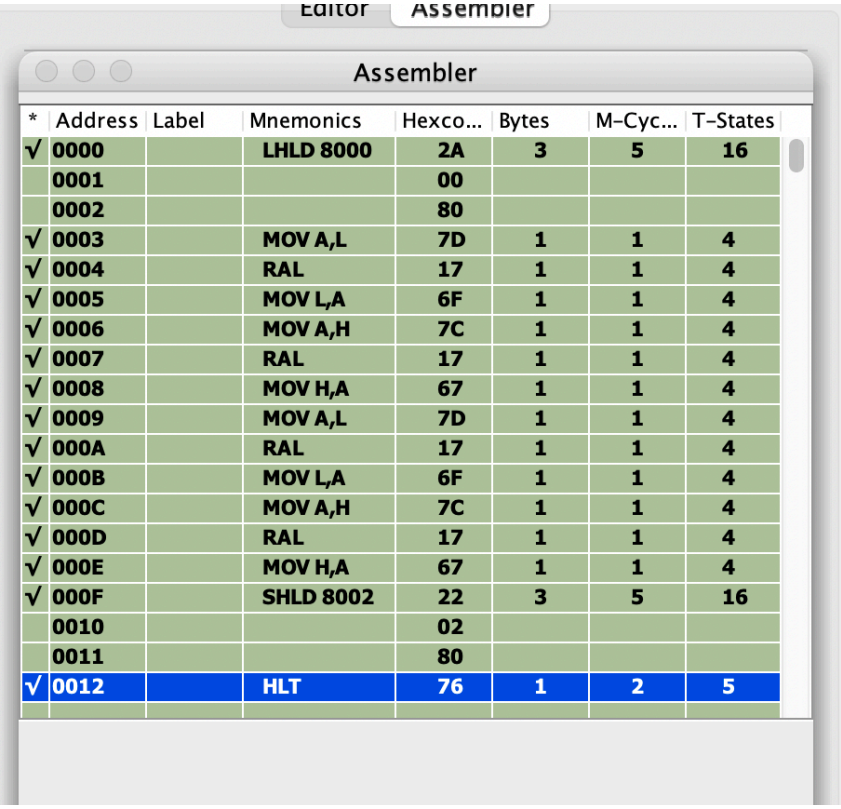
```
# BEGIN 0000H

LHLD 8000

MOV A,L

RAL

MOV L,A

MOV A,H

RAL

MOV H,A

MOV A,L

RAL

MOV L,A

MOV A,H

RAL

MOV H,A

SHLD 8002

HLT

# ORG 8000H

# DB 8BH,95H
```

Simulation:

1. CODE IN EDITOR WINDOW:

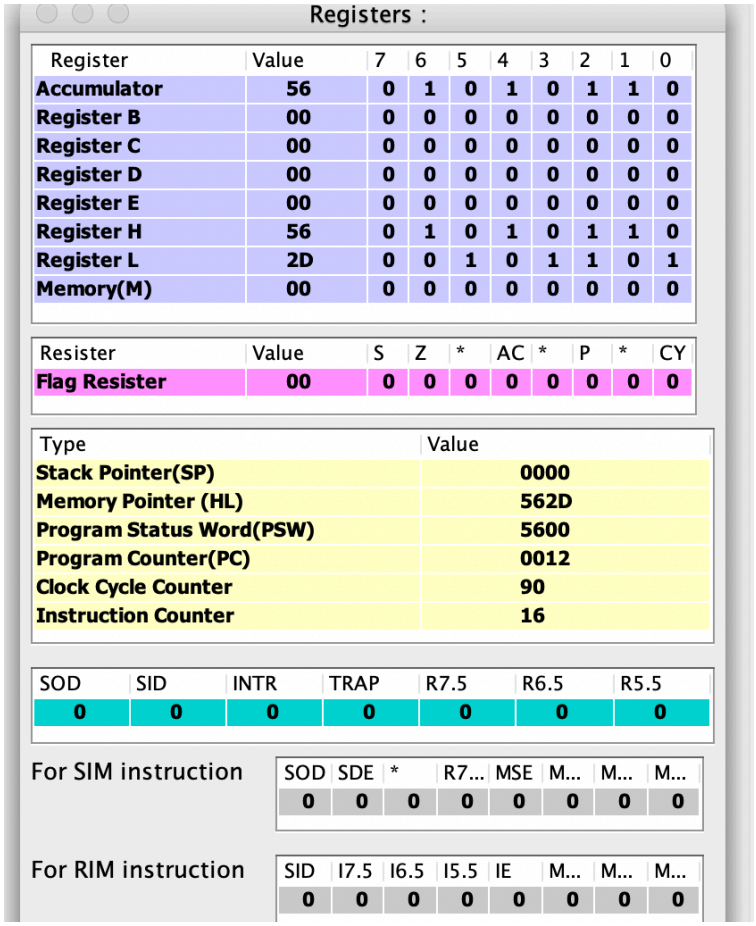


2. ASSEMBLER WINDOW:



*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
√	0000		LHLD 8000	2A	3	5	16
	0001			00			
	0002			80			
√	0003		MOV A,L	7D	1	1	4
√	0004		RAL	17	1	1	4
√	0005		MOV L,A	6F	1	1	4
√	0006		MOV A,H	7C	1	1	4
√	0007		RAL	17	1	1	4
√	0008		MOV H,A	67	1	1	4
√	0009		MOV A,L	7D	1	1	4
√	000A		RAL	17	1	1	4
√	000B		MOV L,A	6F	1	1	4
√	000C		MOV A,H	7C	1	1	4
√	000D		RAL	17	1	1	4
√	000E		MOV H,A	67	1	1	4
√	000F		SHLD 8002	22	3	5	16
	0010			02			
	0011			80			
√	0012		HLT	76	1	2	5

3. REGISTERS:



Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	56	0	1	0	1	0	1	1	0
Register B	00	0	0	0	0	0	0	0	0
Register C	00	0	0	0	0	0	0	0	0
Register D	00	0	0	0	0	0	0	0	0
Register E	00	0	0	0	0	0	0	0	0
Register H	56	0	1	0	1	0	1	1	0
Register L	2D	0	0	1	0	1	1	0	1
Memory(M)	00	0	0	0	0	0	0	0	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	00	0	0	0	0	0	0	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	562D
Program Status Word(PSW)	5600
Program Counter(PC)	0012
Clock Cycle Counter	90
Instruction Counter	16

SOD	SID	INTR	TRAP	R7.5	R6.5	R5.5
0	0	0	0	0	0	0

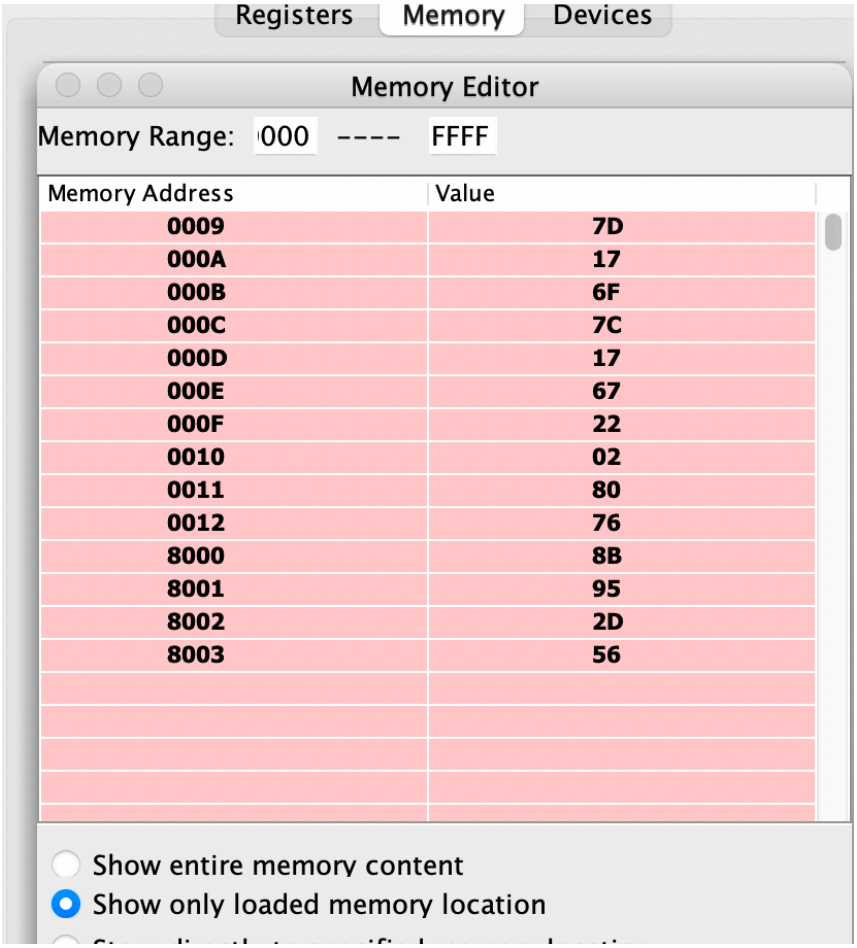
For SIM instruction

SOD	SDE	*	R7...	MSE	M...	M...	M...
0	0	0	0	0	0	0	0

For RIM instruction

SID	I7.5	I6.5	I5.5	IE	M...	M...	M...
0	0	0	0	0	0	0	0

4. MEMORY:


Registers
Memory
Devices
Memory Editor
Memory Range: 000 ---- FFFF
Memory Address
Value
0009 7D
000A 17
000B 6F
000C 7C
000D 17
000E 67
000F 22
0010 02
0011 80
0012 76
8000 8B
8001 95
8002 2D
8003 56
Show entire memory content
Show only loaded memory location

RESULT

BEFORE EXECUTION:

8000H: 8BH
8001H: 95H

AFTER EXECUTION:

8002H: 2DH
8003H: 56H

Learning outcomes (What I have learnt):

1. **Learnt about 8085 simulator**
2. **Learnt how to shift left by 1bit and 2bit of 16bit number.**
3. **Learnt about RAL and its function.**
4.
5.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			