# Experiment 3.2

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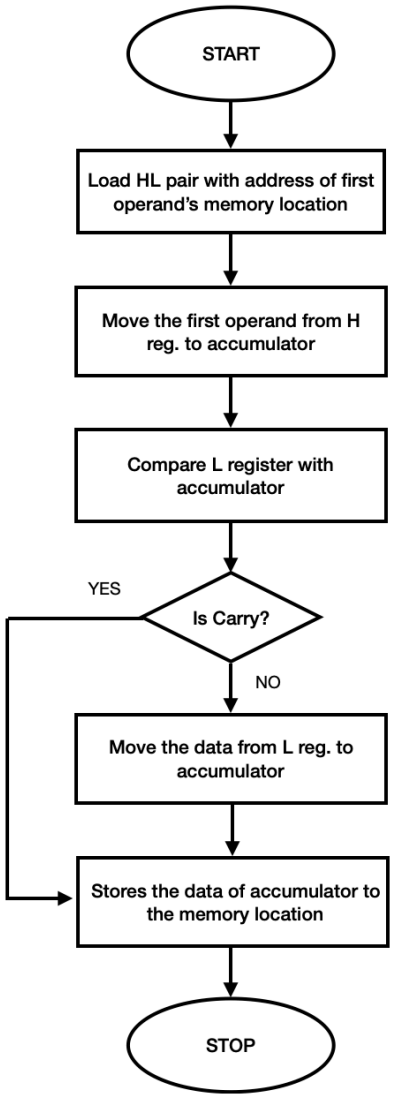
**Branch: CSE** **Section/Group:607A**
**Semester: 4th** **Date of Performance: 26/04/2022**
**Subject Name:MPI Lab** **Subject Code: 22E-20CSP-253**

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

**a) To find largest of two 8 bit number.**

**Apparatus/Simulator used: 8085 simulator**

**Flowchart:**


START
Load HL pair with address of first operand's memory location
Move the first operand from H reg. to accumulator
Compare L register with accumulator
YES
Is Carry?
NO
Move the data from L reg. to accumulator
Stores the data of accumulator to the memory location
STOP

**Algorithm:**

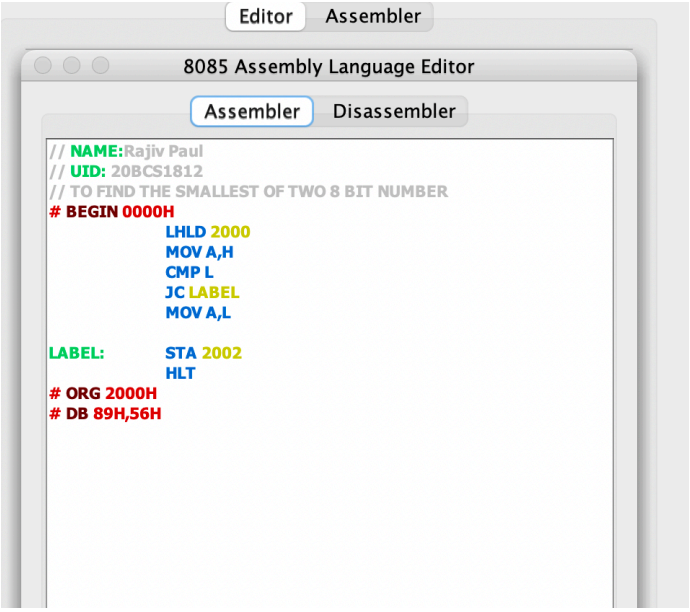
1. **LHLD 2000H loads H-L pair with data from 3000H memory location.**
2. **MOV A,H moves data from reg. H to accumulator.**
3. **CMP L compares L register with accumulator.**
4. **JNC LABEL jumps to the location of the label if there is carry.**
5. **MOV A,L moves data from reg. L to accumulator.**
6. **LABEL: STA 2002H stores value from accumulator to memory location 2002H.**
7. **HLT end of the execution.**

**Steps for experiment/practical/Code:**

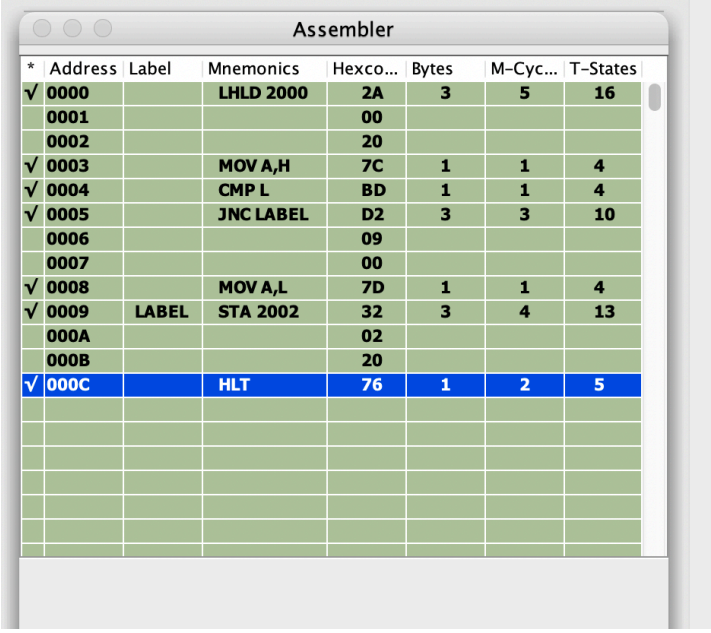
```
# BEGIN 0000H
LHLD 2000
MOV A,H
CMP L
JNC LABEL
MOV A,L
LABEL:    STA 2002
HLT
# ORG 2000H
# DB 89H,56H
```

**Simulation:**

**1.** CODE IN EDITOR WINDOW:

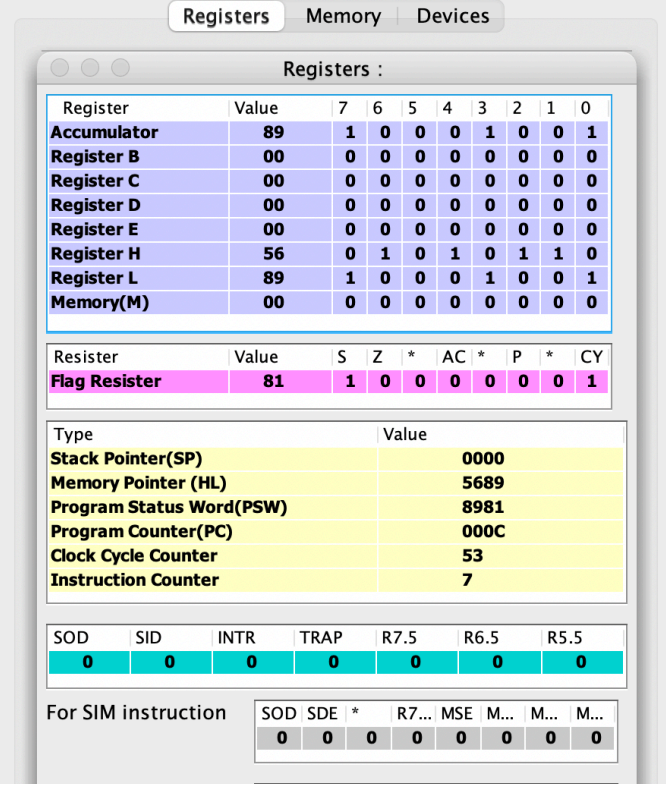



**2.** ASSEMBLER WINDOW:

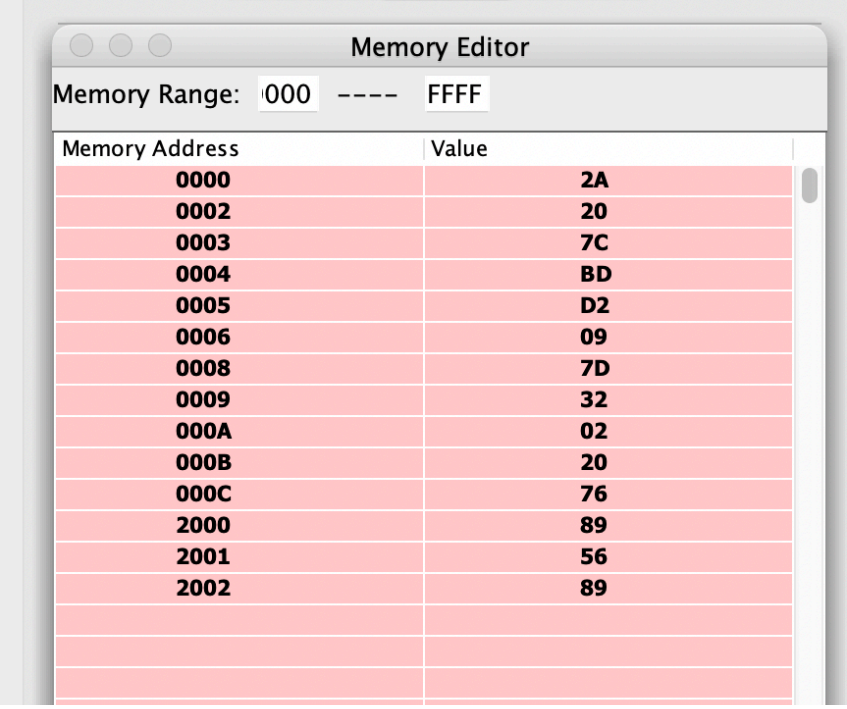



| * | Address | Label | Mnemonics | Hexco... | Bytes | M-Cyc... | T-States |
|---|---|---|---|---|---|---|---|
| √ | 0000 | | LHLD 2000 | 2A | 3 | 5 | 16 |
| | 0001 | | | 00 | | | |
| | 0002 | | | 20 | | | |
| √ | 0003 | | MOV A,H | 7C | 1 | 1 | 4 |
| √ | 0004 | | CMP L | BD | 1 | 1 | 4 |
| √ | 0005 | | JNC LABEL | D2 | 3 | 3 | 10 |
| | 0006 | | | 09 | | | |
| | 0007 | | | 00 | | | |
| √ | 0008 | | MOV A,L | 7D | 1 | 1 | 4 |
| √ | 0009 | LABEL | STA 2002 | 32 | 3 | 4 | 13 |
| | 000A | | | 02 | | | |
| | 000B | | | 20 | | | |
| √ | 000C | | HLT | 76 | 1 | 2 | 5 |

## 3. REGISTERS:


Registers
Memory
Devices
Registers :
Register | Value | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0
Accumulator | 89 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 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 | 56 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0
Register L | 89 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1
Memory(M) | 00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
Resister | Value | S | Z | * | AC | * | P | * | CY
Flag Resister | 81 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1
Type | Value
Stack Pointer(SP) | 0000
Memory Pointer (HL) | 5689
Program Status Word(PSW) | 8981
Program Counter(PC) | 000C
Clock Cycle Counter | 53
Instruction Counter | 7
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
0000 2A
0002 20
0003 7C
0004 BD
0005 D2
0006 09
0008 7D
0009 32
000A 02
000B 20
000C 76
2000 89
2001 56
2002 89

**RESULT**

BEFORE EXECUTION:

2000H: 89H
2001H: 56H

AFTER EXECUTION:

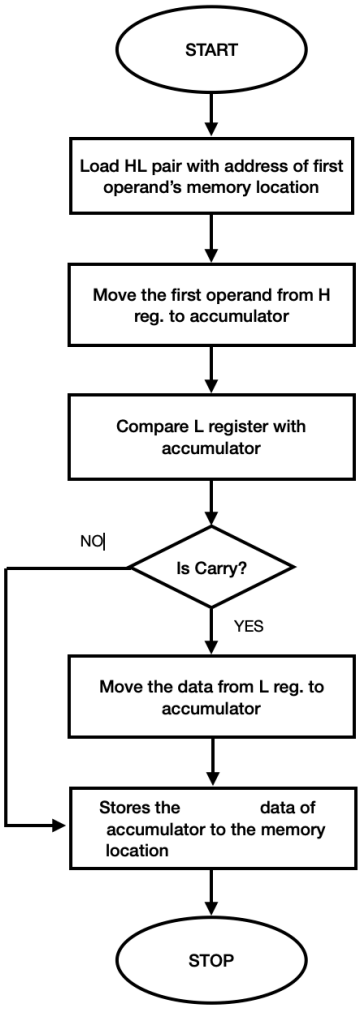
2002H: 89H

**Aim/Overview of the practical:**

**b) To find smallest of two 8 bit number**

**Apparatus/Simulator used: 8085 simulator**

**Flowchart:**



**Algorithm:**

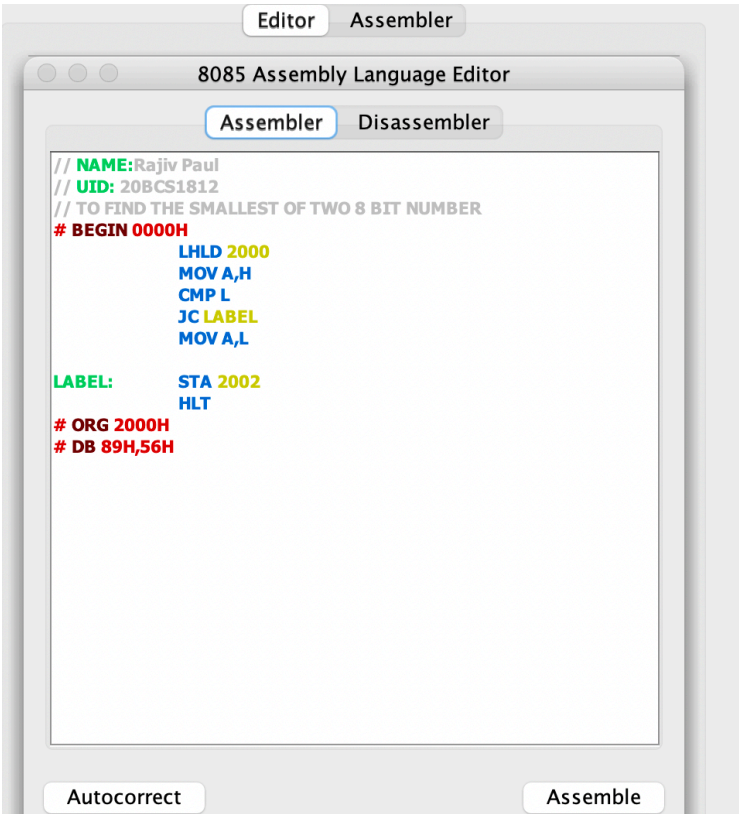
1. **LHLD 2000H loads H-L pair with data from 3000H memory location.**
2. **MOV A,H moves data from reg. H to accumulator.**
3. **CMP L compares L register with accumulator.**
4. **JC LABEL jumps to the location of the label if there is no carry.**
5. **MOV A,L moves data from reg. L to accumulator.**
6. **LABEL: STA 2002H stores value from accumulator to memory location 2002H.**
7. **HLT end of the execution.**

**Steps for experiment/practical/Code:**

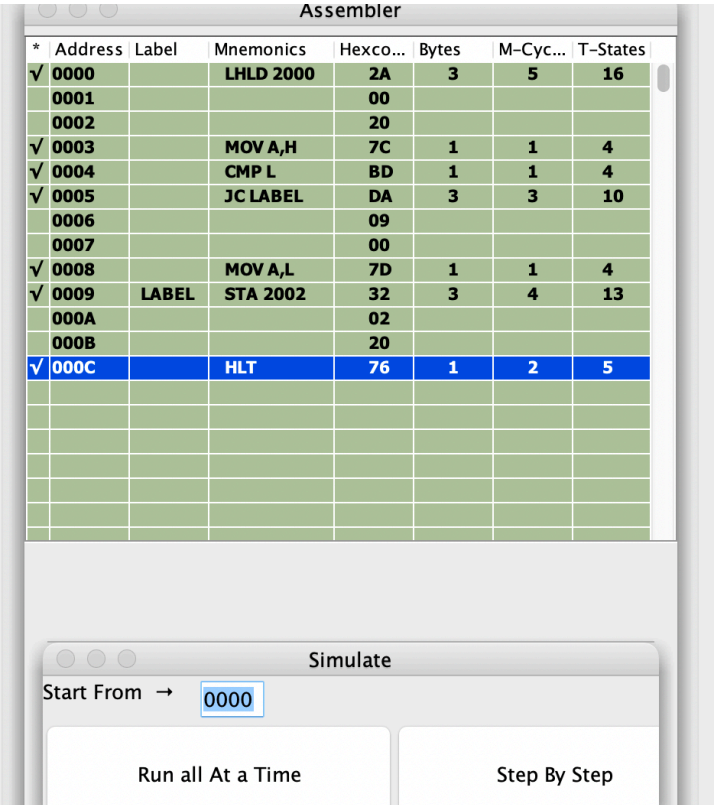
```
# BEGIN 0000H
LHLD 2000
MOV A,H
CMP L
JC LABEL
MOV A,L
LABEL:    STA 2002
HLT
# ORG 2000H
# DB 89H,56H
```

**Simulation:**

1. CODE IN EDITOR WINDOW:

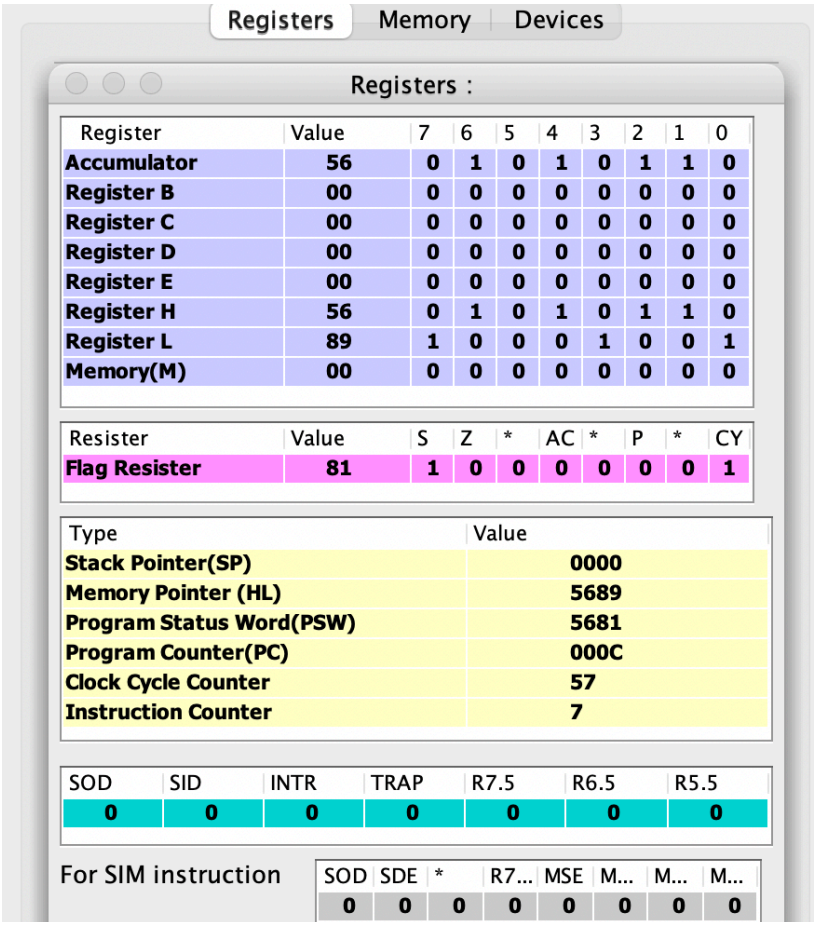


## 2. ASSEMBLER WINDOW:




| * | Address | Label | Mnemonics | Hexco... | Bytes | M-Cyc... | T-States |
|---|---|---|---|---|---|---|---|
| √ | 0000 | | LHLD 2000 | 2A | 3 | 5 | 16 |
| | 0001 | | | 00 | | | |
| | 0002 | | | 20 | | | |
| √ | 0003 | | MOV A,H | 7C | 1 | 1 | 4 |
| √ | 0004 | | CMP L | BD | 1 | 1 | 4 |
| √ | 0005 | | JC LABEL | DA | 3 | 3 | 10 |
| | 0006 | | | 09 | | | |
| | 0007 | | | 00 | | | |
| √ | 0008 | | MOV A,L | 7D | 1 | 1 | 4 |
| √ | 0009 | LABEL | STA 2002 | 32 | 3 | 4 | 13 |
| | 000A | | | 02 | | | |
| | 000B | | | 20 | | | |
| √ | 000C | | HLT | 76 | 1 | 2 | 5 |

## 3. 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 | 89 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Memory(M) | 00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Resister | Value | S | Z | * | AC | * | P | * | CY |
|---|---|---|---|---|---|---|---|---|---|
| Flag Resister | 81 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

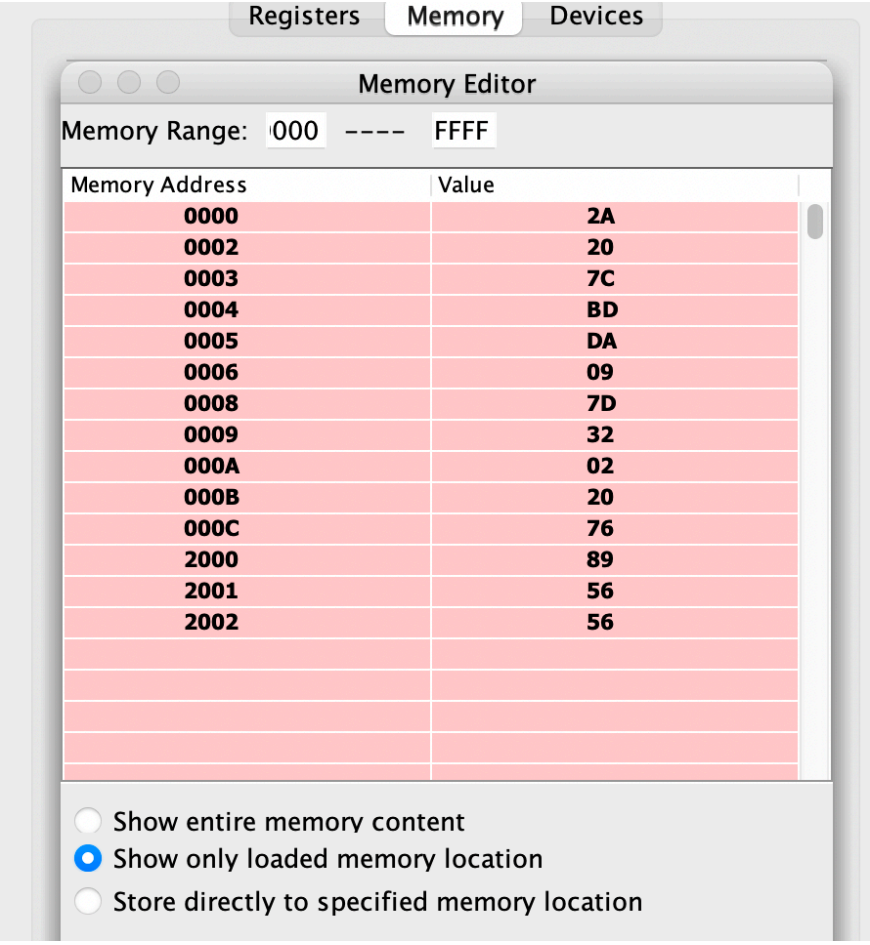
| Type | Value |
|---|---|
| Stack Pointer(SP) | 0000 |
| Memory Pointer (HL) | 5689 |
| Program Status Word(PSW) | 5681 |
| Program Counter(PC) | 000C |
| Clock Cycle Counter | 57 |
| Instruction Counter | 7 |

| 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:


Registers
Memory
Devices
Memory Editor
Memory Range: 0000 ---- FFFF
Memory Address
Value
0000 2A
0002 20
0003 7C
0004 BD
0005 DA
0006 09
0008 7D
0009 32
000A 02
000B 20
000C 76
2000 89
2001 56
2002 56
Show entire memory content
Show only loaded memory location
Store directly to specified memory location

**RESULT**

BEFORE EXECUTION:

2000H: 89H
2001H: 56H

AFTER EXECUTION:

3001H: 56H

**Learning outcomes (What I have learnt):**

1. **Learnt about 8085 simulator**
2. **Learnt how to find largest of two 8bit number.**
3. **Learnt how to find smallest of two 8bit number.**
4. **Learnt about CMP and its function**
5. **Learnt about difference between JNC and JC.**

**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. | | | |
| | | | |