

M&A**PRACTICAL -2**

Aim: Learning Programs using Logical Instructions like
ANA, ANI, ORA, ORI, XRA, XRI, CMA, RAL, RRC, RAR, CMP, CPI etc.

Exercise : (Solution must be handwritten in book)

1. To find 2's complement of 8-bit data without CMA instruction. Take 8-bit data (Last two digit of your enrollment number) in B register and store 2's complement of that number in Reg-L.

The screenshot shows the 8085 Simulator interface. On the left, the **Assembler** window displays the following assembly code:

```

* Address Label Mnemonics Hexco... Bytes M-Cyc... T-States
✓ 0000 MVI B,11 06 2 2 7
 0001 11
✓ 0002 MVI A,FF 3E 2 2 7
  FF
✓ 0003
✓ 0004 XRA B A8 1 1 4
✓ 0005 INR A 3C 1 1 4
✓ 0006 MOV L,A 6F 1 1 4
✓ 0007 HLT 76 1 2 5

```

On the right, the **Registers** window shows the state of various registers:

Register	Value	7	6	5	4	3	2	1	0
Accumulator	EF	1	1	1	0	1	1	1	1
Register B	11	0	0	0	1	0	0	0	1
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	00	0	0	0	0	0	0	0	0
Register L	EF	1	1	1	0	1	1	1	1
Memory(M)	00	0	0	0	0	0	0	0	0

Flag Register values:

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	80	1	0	0	0	0	0	0	0

System Control Registers:

Type	Value
Stack Pointer(SP)	0000
Memory Pointer(HL)	00EF
Program Status Word(PSW)	EF80
Program Counter(PC)	0007
Clock Cycle Counter	31
Instruction Counter	6

Control Registers:

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

No. Converter Tool :

Hexadecimal	Decimal	Binary
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Bottom left: Created by : Jubin Mitra

A. Code :

MVI B, 11H
 MVI A, FFH
 XRA B
 INR A
 MOV L,A
 HLT

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI B,11	96	2	2	2
0001			11			
0002		MVI A,FF	3E	2	2	2
0003			FF			
0004		XRA B	A8	1	1	4
0005						
0006		INR A	3C	1	1	4
0007			6F	1	1	4
0008		MOV L,A	76	1	2	5
0009			HLT			

2. To find 2's complement of given 16-bit number. Take 16-bit number (3 appended with last three digits of your enrollment number) in Register pair HL and 2's complement in DE register pair.

8085 Simulator

The screenshot shows the 8085 Simulator interface with three main tabs: Assembler, Registers, and Simulate.

- Assembler Tab:** Displays the assembly code and its corresponding opcodes and timing details. The code is:

Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
0000		LXI H,3011	21	3	3	10
0001			11			
0002			30			
0003		MOV A,L	7D	1	1	4
0004		CMA	2F	1	1	4
0005		ADI 01	C6	2	2	7
0006			01			
0007		MOV E,A	5F	1	1	4
0008		MOVA,H	7C	1	1	4
0009		CMA	2F	1	1	4
000A		ACI 00	CE	2	2	7
000B			00			
000C		MOV D,A	57	1	1	4
000D		HLT	76	1	2	5
- Registers Tab:** Shows the state of various registers and memory. The Registers section includes:

Register	Value	7	6	5	4	3	2	1	0
Accumulator	CF	1	1	0	0	1	1	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	CF	1	1	0	0	1	1	1	1
Register E	EF	1	1	1	0	1	1	1	1
Register H	30	0	0	1	1	0	0	0	0
Register L	11	0	0	0	1	0	0	0	1
Memory(M)	00	0	0	0	0	0	0	0	0

 The Flag Register section shows:

Flag Register	Value	S	Z	*	AC	*	P	*	CY
Flag Register	84	1	0	0	0	0	1	0	0

 The Type section includes:

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	3011
Program Status Word(PSW)	CF84
Program Counter(PC)	000D
Clock Cycle Counter	53
Instruction Counter	10
- Simulate Tab:** Contains buttons for "Run all At a Time" and "Step By Step".

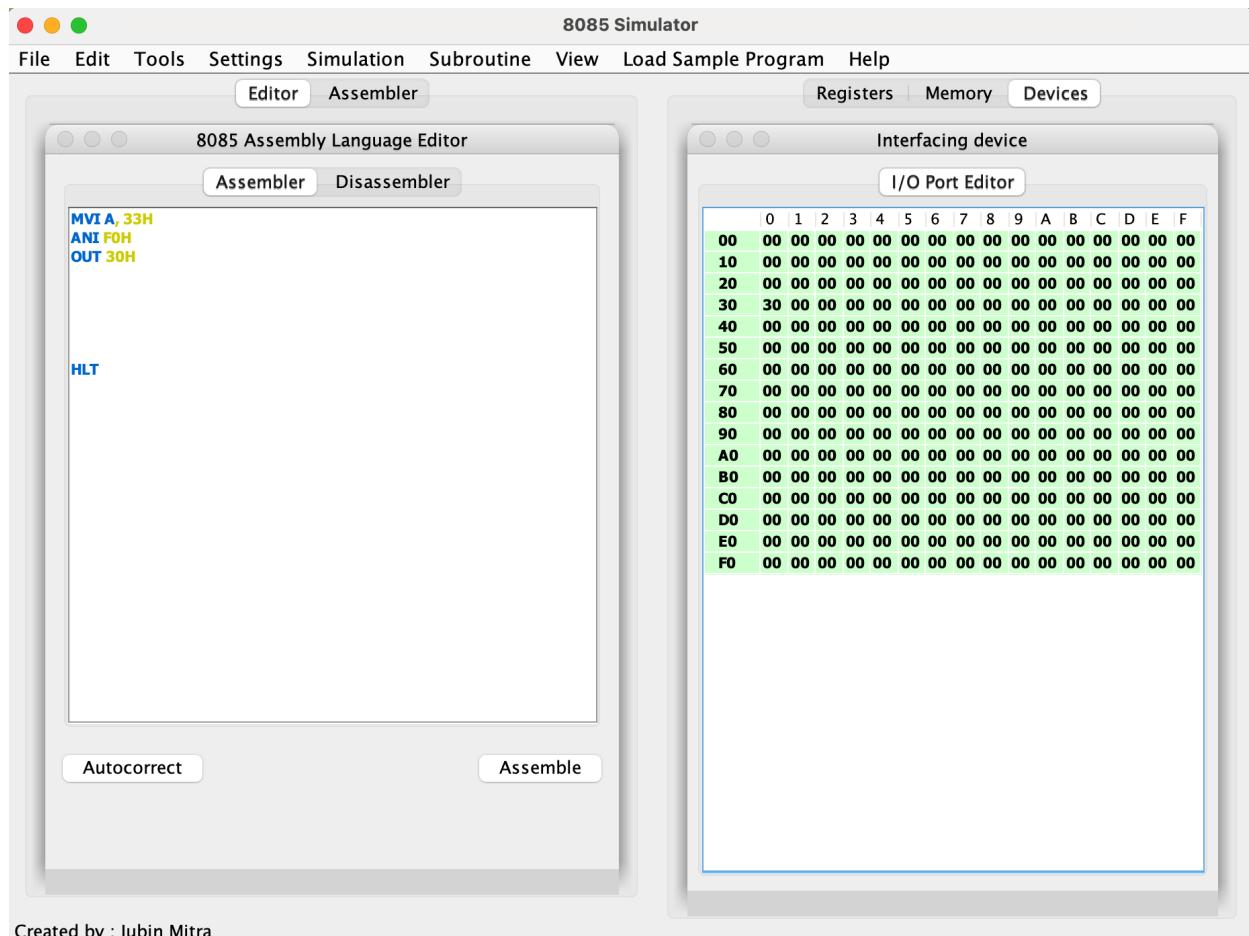
Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0001	LVIH,3011H		21	3	3	10
0002			11			
0003			30			
0004	MOV A, L		70	1	1	4
0005	CMA		2F	1	1	4
0006	ADI 01H		C6	2	2	7
0007			01			
0008	MOV D, A		5F	1	1	3
0009	MOVA, Y		7C	1	1	7
000A	CMA		2F	1	1	4
000B	ACI 00H		C0	2	2	7
000C			00			
000D	MOVA, A		5F	1	1	4
000E	HLT		76	2	2	15

3. To learn masking patterns and hence making specific bits to zero. Take one 8-bit data that is multiplied by 3 with last two digits of your enrollment number. Perform operations to result as follows and display on the port 30H, 31H and 32H respectively:

Case 1: Lower nibble should be masked and upper nibble should remain unchanged.

The screenshot shows the 8085 Simulator interface with the following details:

- Assembler Window:** Displays the assembly code and its corresponding opcodes and timing details. The code includes MVI A,33, ANI F0, OUT 30, and HLT.
- Registers Window:** Shows the state of various registers and memory. The Accumulator contains 30, Registers B-L contain 00, and Memory(M) contains 3E. The Flag Register shows S=0, Z=0, AC=1, P=0, CY=0.
- Simulate Window:** Allows starting the simulation from address 0000 and choosing between Run all At a Time and Step By Step.
- Control Registers:** Shows the values for Stack Pointer (SP), Memory Pointer (HL), Program Status Word (PSW), Program Counter (PC), Clock Cycle Counter, and Instruction Counter.
- Port Registers:** Shows the values for SOD, SID, INTR, TRAP, R7.5, R6.5, and R5.5.
- Instruction Control:** Provides fields for entering SOD, SDE, R7..., MSE, M..., M..., and M... values for SIM and RIM instructions.
- Converter Tool:** A tool for converting between Hexadecimal, Decimal, and Binary formats.



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Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,33H	3E 33	2	2	2
0001						
0002		ANI F0H	F6 F0	2	2	7
0003						
0004		OUT 30H	D3 30	2	3	10
0005						
0006		HLT	F6	1	2	5

Case 2: All even bits shall be masked.

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8085 Simulator

Assembler

*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓	0000		MVI A,33	3E	2	2	7
	0001			33			
✓	0002		ANIA AA	E6	2	2	7
	0003			AA			
✓	0004		OUT 31	D3	2	3	10
	0005			31			
✓	0006		HLT	76	1	2	5

Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	22	0	0	1	0	0	0	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	14	0	0	0	1	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer(HL)	0000
Program Status Word(PSW)	2214
Program Counter(PC)	0006
Clock Cycle Counter	29
Instruction Counter	4

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

No. Converter Tool :

Hexadecimal	Decimal	Binary
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8085 Simulator

Assembler

*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓	0000		MVI A,33	3E	2	2	7
	0001			33			
✓	0002		ANIA AA	E6	2	2	7
	0003			AA			
✓	0004		OUT 31	D3	2	3	10
	0005			31			
✓	0006		HLT	76	1	2	5

Registers | Memory | Devices

Interfacing device

I/O Port Editor

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	00	22	00	00	00	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Simulate

Start From → 0000

3 (case-2) :

code :

```
MVI A,33H
ANI AAH
OUT 31H
HLT
```

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,33H	3E 33	2	2	2
0001						
0002		ANI AAH	E6 00	2	2	7
0003						
0004		OUT 32	D3 32	2	3	10
0005						
0006		HLT	76	1	2	5

Case 3: Answer after masking becomes zero.

8085 Simulator

File Edit Tools Settings Simulation Subroutine View Load Sample Program Help

Editor Assembler Registers Memory Devices

Assembler

*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓	0000		MVI A,33	3E	2	2	7
	0001			33			
✓	0002		ANI 00	E6	2	2	7
	0003			00			
✓	0004		OUT 32	D3	2	3	10
	0005			32			
✓	0006		HLT	76	1	2	5

Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	00	0	0	0	0	0	0	0	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	54	0	1	0	1	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer(HL)	0000
Program Status Word(PSW)	0054
Program Counter(PC)	0006
Clock Cycle Counter	63
Instruction Counter	9

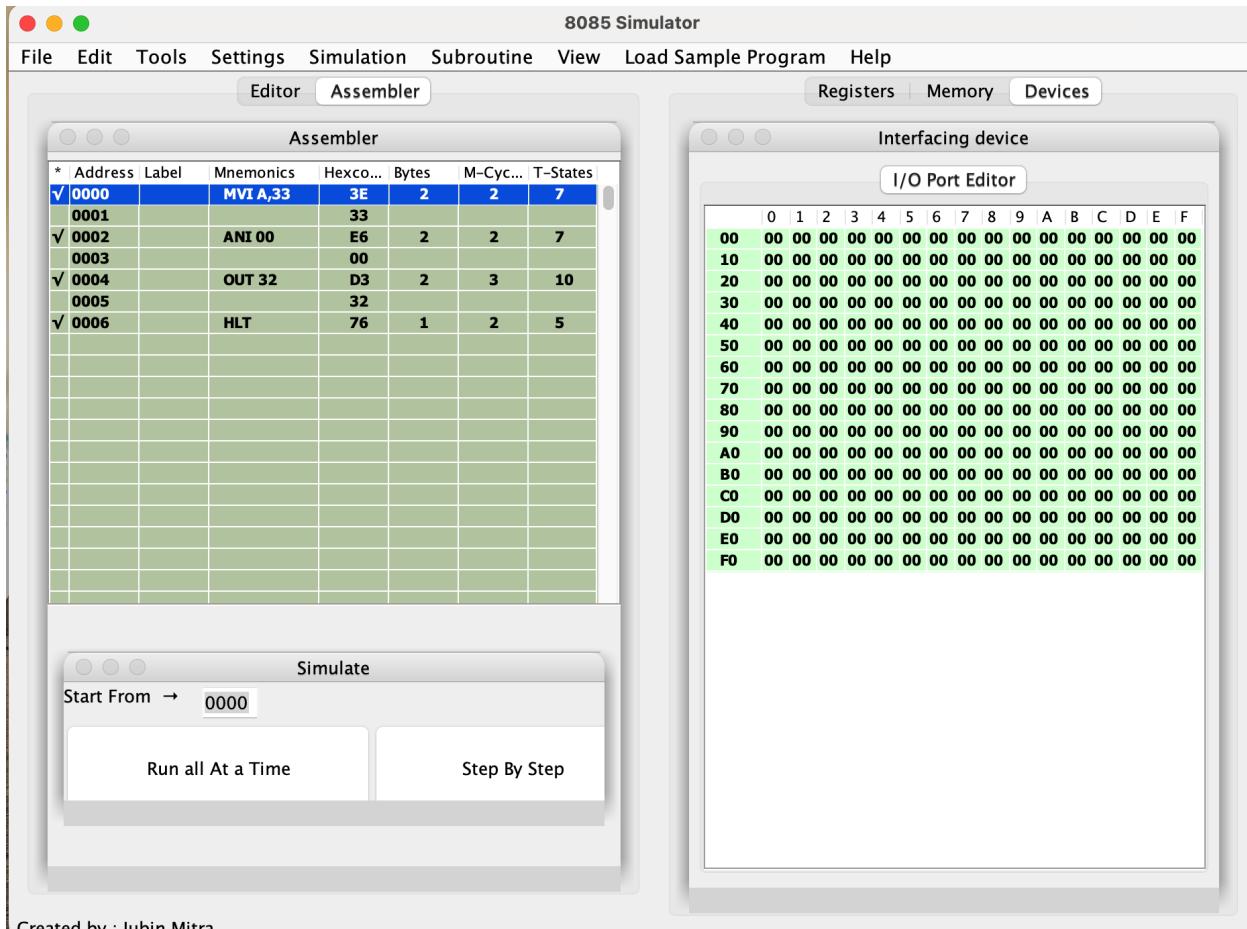
SOD	SID	INTR	TRAP	R7.5	R6.5	R5.5
0	0	0	0	0	0	0

For SIM instruction		SOD	SDE	*	R7...	MSE	M...	M...	M...
0	0	0	0	0	0	0	0	0	0

For RIM instruction		SID	I7.5	I6.5	I5.5	IE	M...	M...	M...
0	0	0	0	0	0	0	0	0	0

No. Converter Tool :

Hexadecimal	Decimal	Binary
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3 (case-3) :

code :

```
MVI A,33H
ANI 00H
OUT 32H
HLT
```

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,33H	3E	2	2	2
0001			33			
0002		ANI 00	E6	2	2	7
0003			00			
0004		OUT 32	D3	2	3	10
0005			32			
0006		HLT	76	1	2	5

4. To learn unmasking patterns and hence making specific bits to one. Take one 8-bit that is multiplied by 4 with the last two digits of your enrollment number. Perform operations to result as follows and display on the port 10H, 11H and 12H respectively:

Case 1: Upper nibble should be unmasked and lower nibble should remain unchanged.

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The figure shows the 8085 Simulator application window with three main tabs: Assembler, Registers, and Simulate.

- Assembler Tab:** Displays assembly code and its corresponding machine code. The code includes MVI A,44, ORI F0, OUT 10, and HLT. The table columns are: * Address, Label, Mnemonics, Hexco..., Bytes, M-Cyc..., and T-States.
- Registers Tab:** Shows the state of various registers. The table includes: Register (Accumulator, Register B, Register C, Register D, Register E, Register H, Register L, Memory(M)), Value, and Status bits (7, 6, 5, 4, 3, 2, 1, 0). It also displays the Flag Register (S, Z, AC, P, CY) with values 80, 1, 0, 0, 0 respectively.
- Simulate Tab:** Allows users to start simulation from address 0000. It has two options: "Run all At a Time" and "Step By Step".

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4 (case - 1):

Code :

```
MVI A,44H
ORI F0H
OUT 10H
HLT
```

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,44H	3E 44	2	2	7
0001			44			
0002		ORI F0H	F6 F0	2	2	7
0003			F0			
0004		OUT 10H	D3 10	2	3	10
0005			10			
0006		HLT	76	1	2	5

Case 2: All odd bits shall be unmasked.

8085 Simulator

File Edit Tools Settings Simulation Subroutine View Load Sample Program Help

Editor Assembler Registers Memory Devices

Assembler

* Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓ 0000		MVI A,44	3E	2	2	7
0001			44			
✓ 0002		ORI 55	F6	2	2	7
0003			55			
✓ 0004		OUT 11	D3	2	3	10
0005			11			
✓ 0006		HLT	76	1	2	5

Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	55	0	1	0	1	0	1	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	04	0	0	0	0	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	0000
Program Status Word(PSW)	5504
Program Counter(PC)	0006
Clock Cycle Counter	29
Instruction Counter	4

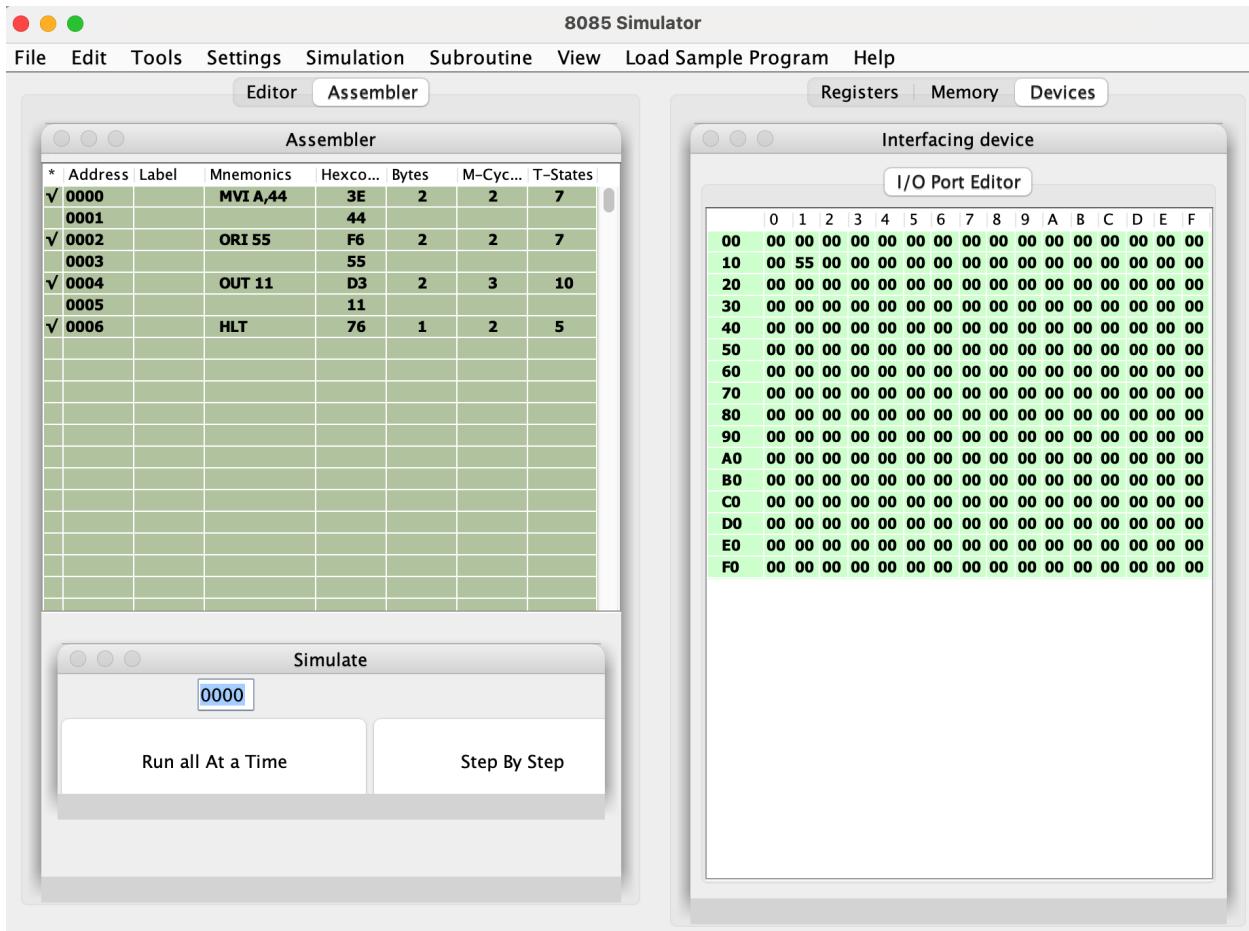
SOD	SID	INTR	TRAP	R7.5	R6.5	R5.5
0	0	0	0	0	0	0

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

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

No. Converter Tool :

Hexadecimal	Decimal	Binary
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Created by : Jubin Mitra

4. (case-2):

Code:

MVI A, 44H
ORI 55H
OUT 11H
HLT

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MV1 A,44H	3E44	2	2	7
0001			44			
0002		OR1J3H	F6	2	2	7
0003			55			
0004		OUT11H	D3	2	3	10
0005			11			
0006		HLT	F6	1	2	5

Case 3: Answer after unmasking becomes all bits one.

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8085 Simulator

Assembler

* Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓ 0000		MVI A,44	3E	2	2	7
0001			44			
✓ 0002		ORI FF	F6	2	2	7
0003			FF			
✓ 0004		OUT 12	D3	2	3	10
0005			12			
✓ 0006		HLT	76	1	2	5

Registers

Register	Value	7	6	5	4	3	2	1	0
Accumulator	FF	1	1	1	1	1	1	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	84	1	0	0	0	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	0000
Program Status Word(PSW)	FF84
Program Counter(PC)	0006
Clock Cycle Counter	29
Instruction Counter	4

Simulate

Start From → 0000

Run all At a Time Step By Step

Registers :

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

SID	I7.5	I6.5	I5.5	IE	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

No. Converter Tool :

Hexadecimal Decimal Binary

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8085 Simulator

Assembler

* Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓ 0000		MVI A,44	3E	2	2	7
0001			44			
✓ 0002		ORI FF	F6	2	2	7
0003			FF			
✓ 0004		OUT 12	D3	2	3	10
0005			12			
✓ 0006		HLT	76	1	2	5

Registers

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	FF	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Interfacing device

I/O Port Editor

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	FF	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
80	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Simulate

Start From → 0000

Run all At a Time Step By Step

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4. (case-3) :

code :

```
MVI A,44H
ORI FFH
OUT 12H
HLT
```

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,44	3E 44	2	2	7
0001			44			
0002		ORI FF	F6 FF	2	2	7
0003			FF			
0004		OUT 12	0C 12	2	3	10
0005			12			
0006		HLT	7F	1	2	5

5. Get data byte from input port 03H and complement Lower Nibble. Store the result on the next memory location.

8085 Simulator

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Assembler

*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓	0000		MVI A,11	3E	2	2	7
	0001			11			
✓	0002		OUT 03	D3	2	3	10
	0003			03			
✓	0004		MVI A,00	3E	2	2	7
	0005			00			
✓	0006		IN 03	DB	2	3	10
	0007			03			
✓	0008		XRI 0F	EE	2	2	7
	0009			0F			
✓	000A		OUT 04	D3	2	3	10
	000B			04			
✓	000C		HLT	76	1	2	5

Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	1E	0	0	0	1	1	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	04	0	0	0	0	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	0000
Program Status Word(PSW)	1E04
Program Counter(PC)	000C
Clock Cycle Counter	56
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

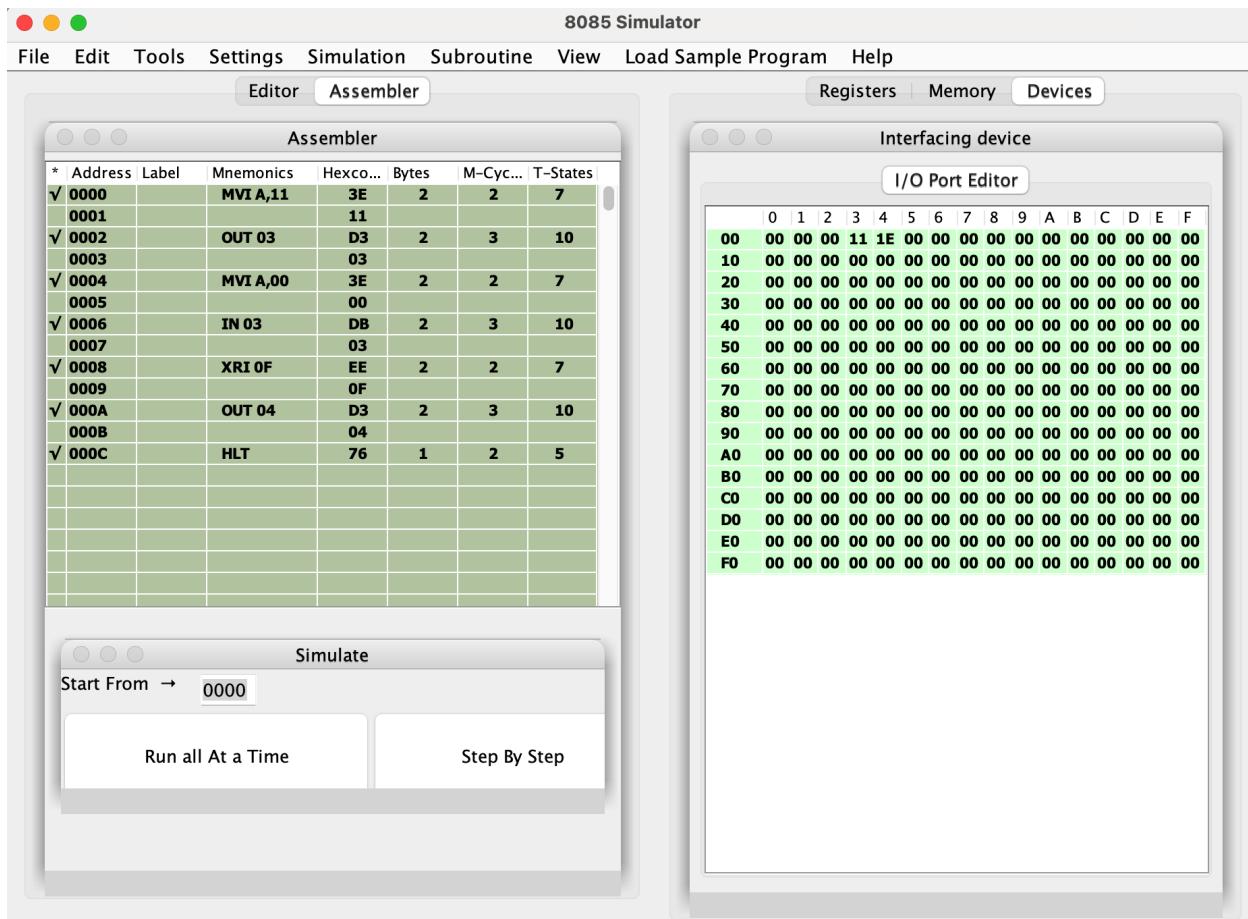
For RIM instruction

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

No. Converter Tool :

Hexadecimal	Decimal	Binary
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S' Code :

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,11H	3E 11	2	2	7
0001		OUT 03H	D3 03	2	3	10
0002		MVI A,00H	3E 00	2	2	7
0003		IN 03H	DB 03	2	3	10
0004		XRI OFH	C6 OF	2	2	7
0005		OUT 04H	D3 04	2	3	10
0006		HLT	76	1	2	5

6. Get data byte from input port 30H and complement Upper Nibble. Store the result on the next memory location.

8085 Simulator

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Editor Assembler Registers Memory Devices

Assembler

*	Address	Label	Mnemonics	Hexco...	Bytes	M-Cyc...	T-States
✓	0000		MVI A,11	3E	2	2	7
	0001			11			
✓	0002		OUT 30	D3	2	3	10
	0003			30			
✓	0004		MVI A,00	3E	2	2	7
	0005			00			
✓	0006		IN 30	DB	2	3	10
	0007			30			
✓	0008		XRI F0	EE	2	2	7
	0009			F0			
✓	000A		OUT 31	D3	2	3	10
	000B			31			
✓	000C		HLT	76	1	2	5

Registers :

Register	Value	7	6	5	4	3	2	1	0
Accumulator	E1	1	1	1	0	0	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	00	0	0	0	0	0	0	0	0
Register L	00	0	0	0	0	0	0	0	0
Memory(M)	3E	0	0	1	1	1	1	1	0

Resister	Value	S	Z	*	AC	*	P	*	CY
Flag Resister	84	1	0	0	0	0	1	0	0

Type	Value
Stack Pointer(SP)	0000
Memory Pointer (HL)	0000
Program Status Word(PSW)	E184
Program Counter(PC)	000C
Clock Cycle Counter	56
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

For RIM instruction		SID	I7.5	I6.5	I5.5	IE	M...	M...	M...
		0	0	0	0	0	0	0	0

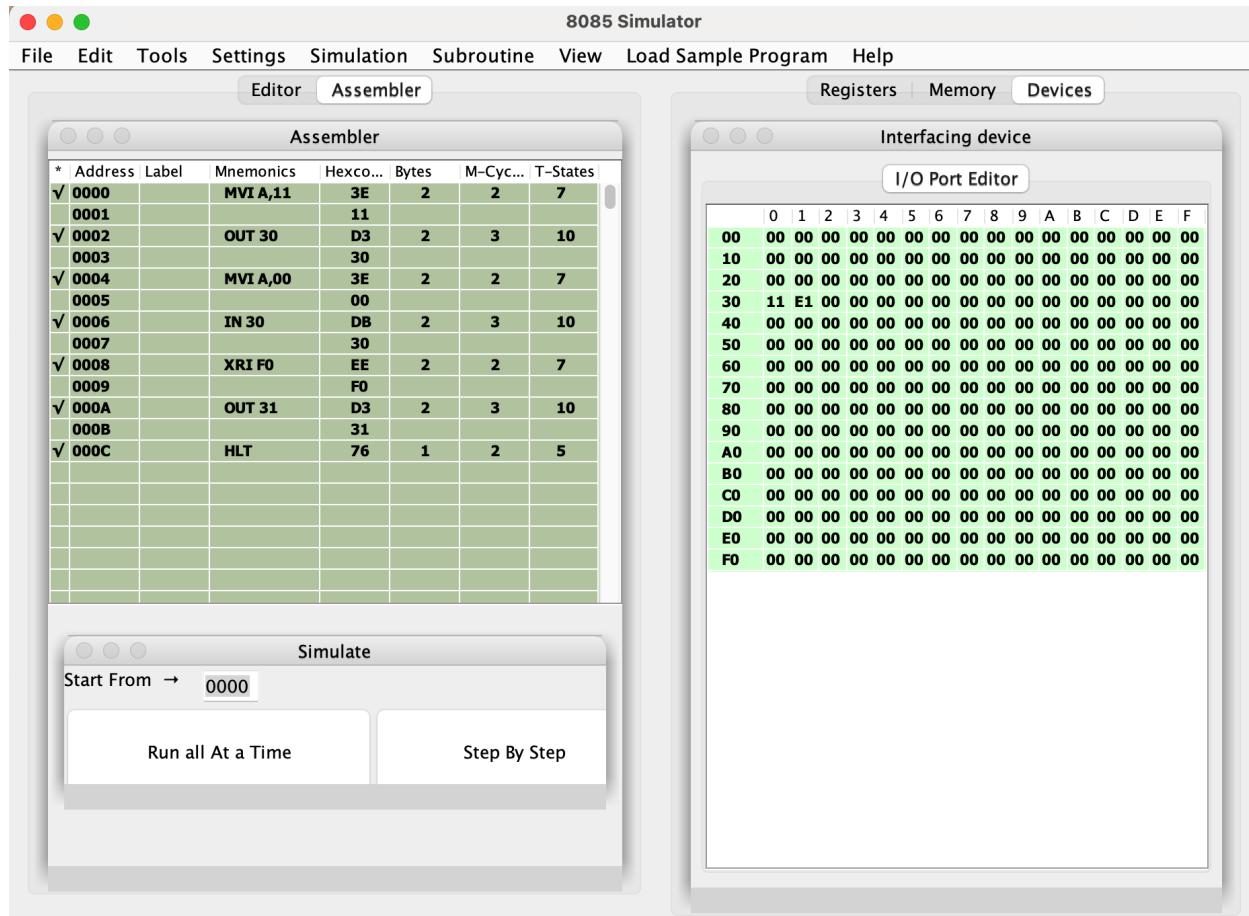
No. Converter Tool :

Hexadecimal	Decimal	Binary
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KARIYA RAJ

21162101011



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G.J Code :

Address	Label	Mnemonics	hexCode	Bytes	M-Cycles	T-States
0000		MVI A,11	3E	2	2	7
0001			11			
0002		OUT 30	D3	2	3	10
0003			30			
0004		MVI A,00	3E	2	2	7
0005			00			
0006		IN 30	DB	2	3	7
0007			30			
0008		XRI F0	EE	2	2	7
0009			F0			
000A		OUT 31	D3	2	3	10
000B			31			
000C		HLT	76	1	2	5

MVI A,11H
OUT 30H
MVI A,00H
IN 30H
XRI F0H
OUT 31H
HLT

7. Write functionality of following mnemonics/code. Explain with example

- RLC, RAL, RRC, RAR, CMP, CPI

7.	1. RLC	RLC Stands for "Rotate Left Accumulator". It rotates the accumulator contents to the left by 1-bit position.	MVI A, 11H RLC HLT
	2. RAL	RAL Stands for "Rotate Accumulator left". It rotates the accumulator content to left by 1-bit pos.	MVI A, 11H RAL HLT
	3. RRC	RRC stands for "Rotate Right Accumulator". It rotates eight bits in the accumulator & one bit in the carry flag one bit position.	MVI A, 11H RRC HLT
	4. RAR	RAR Stands for "Rotate Accumulator right including cyflag in rotation". It rotates the accumulated contents to the right by 1-bit position .	MVI A, 11H RAR HLT
5.	CMP	The CMP instruction compares two operands. It is generally used in conditional execution. This basically subtracts one operand from the other comparing whether the operands are equal or not.	MOV A, 11H MOV B, 11H CMP B HLT
6.	CPI	CPI stands for "compare immediate with Accumulator". for any 8-bit data. This instn is used to compare Accumulator with 8-bit immediate data.	MVI A, 11H CPI, 10H HLT