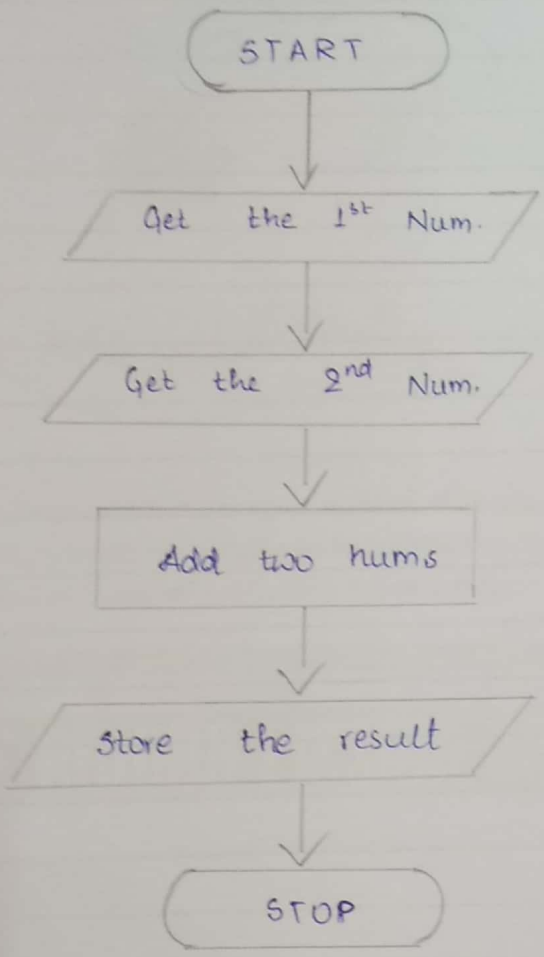


Q. Write an assembly language program to add two 8-bit numbers. by :-

a) Fetching two numbers from memory location and storing the results back into memory location:

- CODE

```
LDA   003AH
MOV   B,A
LDA   003BH
ADD   B
STA   003CH
HLT
```

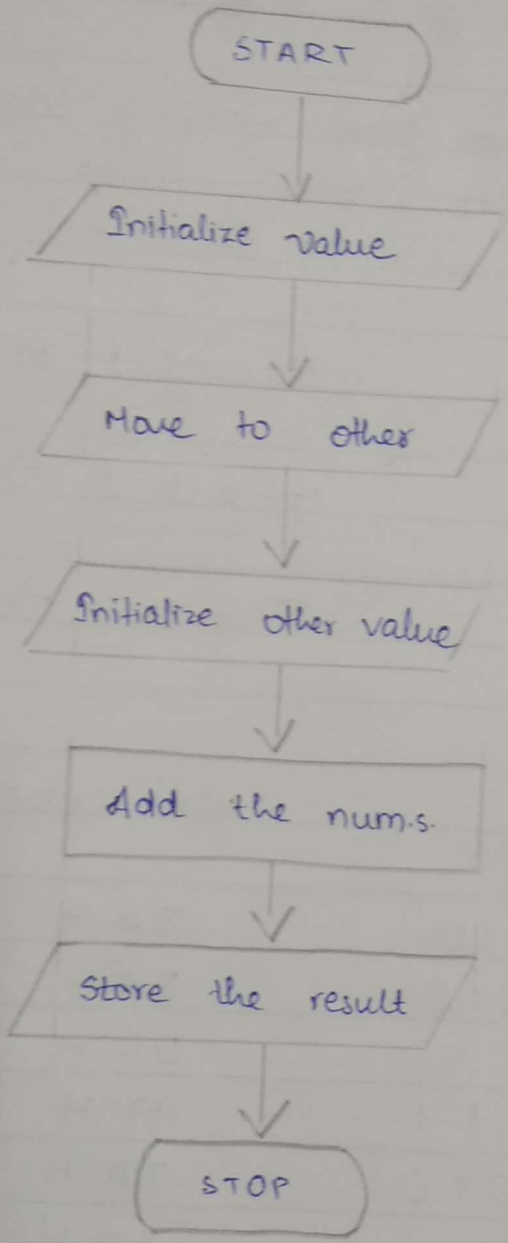
- SAMPLE PROBLEM

operand 1 => 0002H (value)
003AH (Add.)

operand 2 => 0003H (value)
003BH (Add.)

Result => 0005H (02H + 03H)
003CH (Add.)

PROGRAM COUNTER	MAIN MEMORY	HEX CODE	MNEMONICS
0000H	0011 1010	3A H	
	0011 1010	3A H	LDA 003A H
	0000 0000	00 H	
0003H	0100 0111	47 H	MOV B,A
0004H	0011 1010	3A H	
	0011 1011	3B H	LDA 003B H
	0000 0000	00H	
0007H	1000 0000	80 H	ADD B
0008H	0011 0010	32 H	
	0011 1100	3C H	STA 003C H
	0000 0000	00 H	
000BH	0111 0110	76 H	HLT



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b) Loading the values of two numbers to registers & storing the result in a memory location:

- CODE

```
MVI   B,05H
MOV   A,B
MVI   B,06H
ADD   B
STA   003AH
HLT
```

- SAMPLE PROBLEM

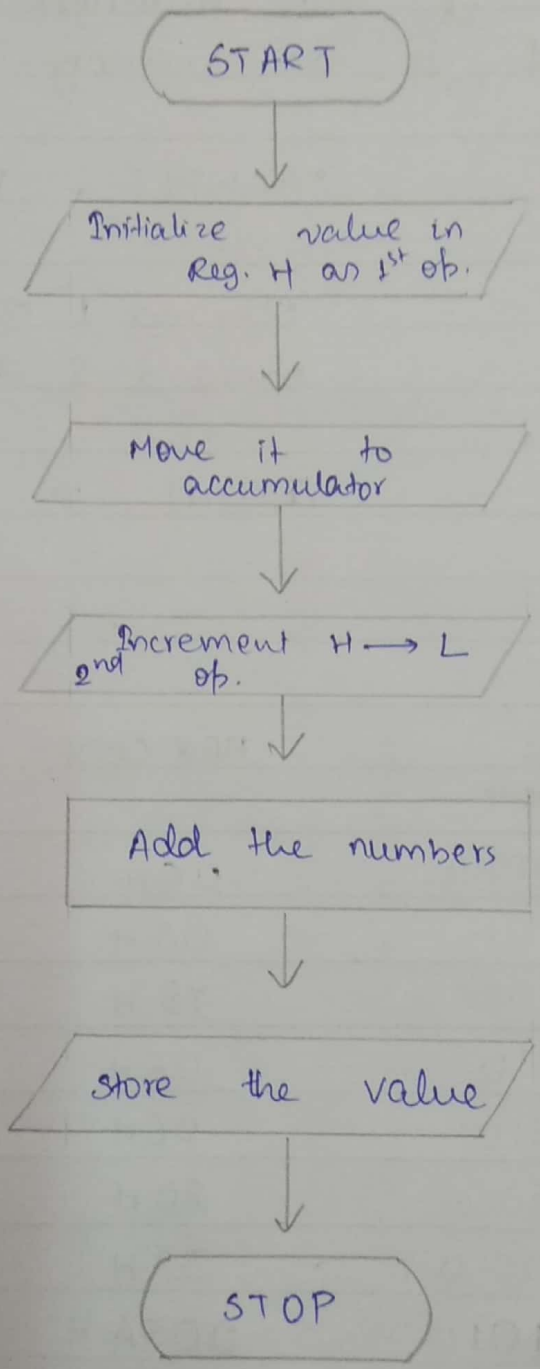
Operand 1 ⇒ 05 H (value)
Operand 2 ⇒ 06H (value)

Result ⇒ 000B H
003A H (Add.)

PROGRAM COUNTER	MAIN MEMORY	HEX CODE	MNEMONICS
0000H	0000 0110	06H	MVI B, 05H
	0000 0101	05H	
0002H	0111 1000	78 H	MOV A, B
0003H	0000 0110	06 H	MVI B, 06H
	0000 0110	06H	
0005H	1000 0000	80 H	ADD B
0006H	0011 0010	32 H	STA 003A H
	0011 0010	003A H	
	000 0000	00 H	
0009H	0111 0110	76 H	HLT

c) Indirect addressing of two numbers using register pairs & storing the result in a memory location.

Teacher's Signature : _____



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• CODE

```
LXI H,003AH
MOV A,M
INX H
ADD M
STA 003CH
HLT
```

• SAMPLE PROBLEM

HL → 003A H → 05 H

003A H

(on increment) ++

07 H

003B H

Result ⇒ 0C H

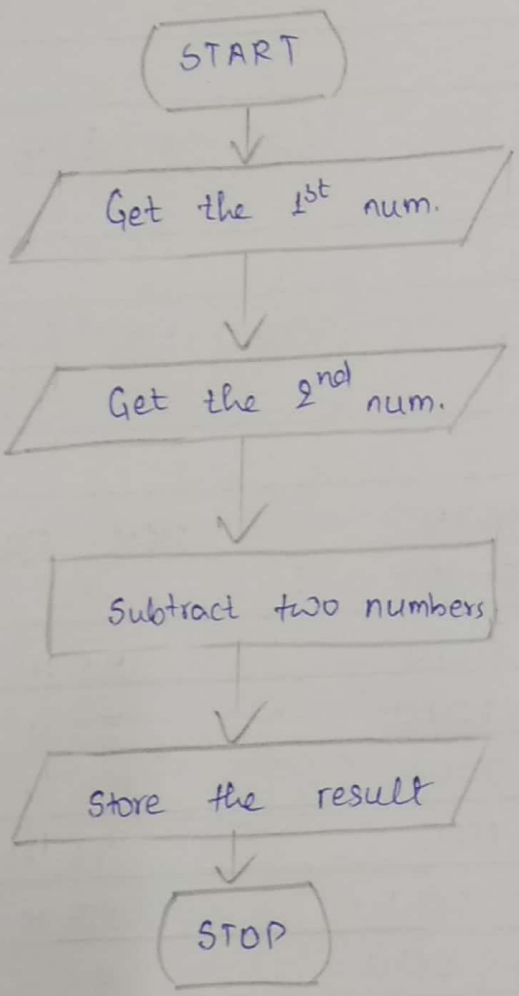
003C H

PROGRAM COUNTER	MAIN MEMORY	HEX CODE	MNEMONICS
0000H	0010 0001	21 H	LXI H, 003A H
	0011 1010	3A H	
	0000 0000	00 H	
0003H	0111 1110	7E H	MOV A,M
0004H	0010 0011	23 H	INX H
0005H	1000 0110	86 H	ADD M
0006H	0011 0010	32H	STA 003CH
	0011 1100	3CH	
	0000 0000	00H	
0009H	0111 0110	76H	HLT

Q. Write an assembly language program to subtract two 8-bit numbers by:

a) Fetching two numbers from memory location.

Teacher's Signature : _____



and storing the result back into a memory location.

- CODE

```
LDA  003A H
MOV  B, A
LDA  003B H
SUB  B
STA  003C H
HLT
```

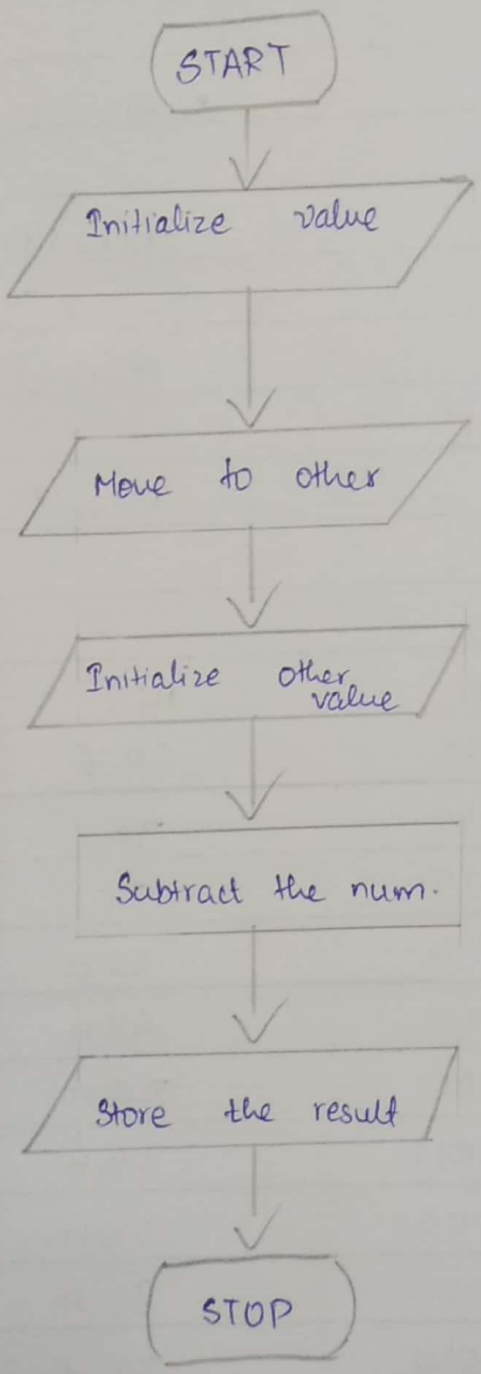
- SAMPLE PROBLEM

Operand 1 ⇒	03A H (Value) 003A H (Add)	
Operand 2 ⇒	05 H 003B H	
Result ⇒	02 H 003C H	

PROGRAM COUNTER	MAIN MEMORY	HEX. CODE	MNEMONICS
0000 H	0011 1010	3A H	LDA 003A H
	0011 1010	3A H	
	0000 0000	00 H	
0003 H	0100 0111	47 H	MOV B, A
0004 H	0011 1010	3A H	LDA 003B H
	0011 1011	3B H	
	0000 0000	00 H	
0007 H	1001 0000	90 H	SUB B
0008 H	0011 0010	32 H	STA 003C H
	0011 1100	3C H	
	0000 0000	00 H	
000B H	0111 0110	76 H	HLT

b) Loading the values of two numbers to registers & storing the result in a memory location.

Teacher's Signature : _____



• CODE

```
MVI   B, 05H
MOV   A, B
MVI   B, 02H
SUB   B
STA   003AH
HLT
```

• SAMPLE PROBLEM

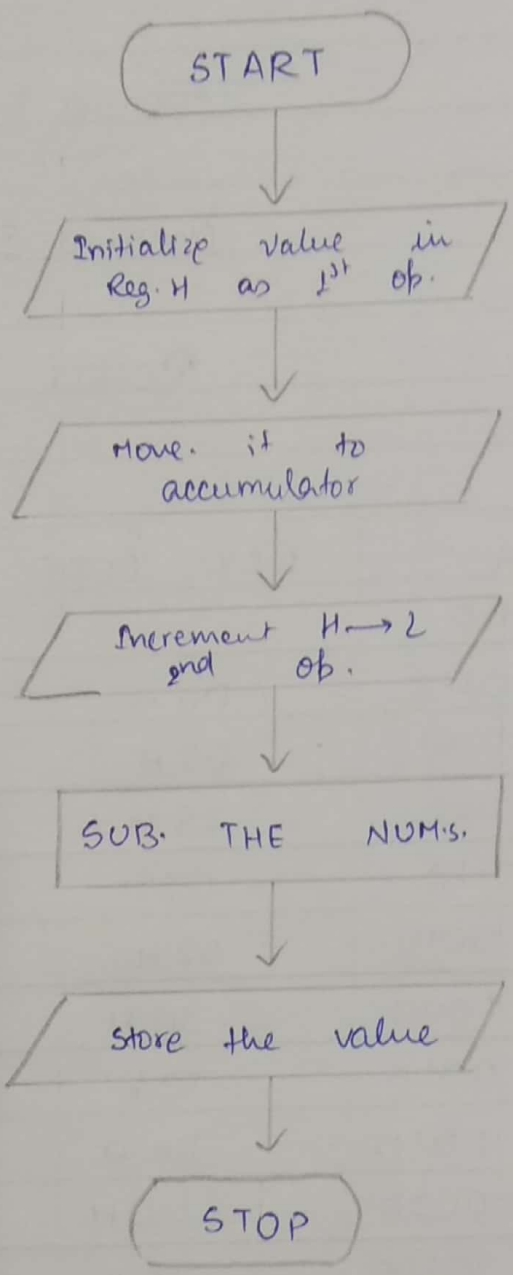
Operand 1 (value) => 05 H

Operand 2 (value) => 02 H

Result => 03 H
003A H (Add.)

PROGRAM COUNTER	MAIN MEMORY	HEX. CODE	MNEMONICS
0000 H	0000 0110	06 H.	MVI B, 05H
	0000 0101	05 H	
0002 H	0111 1000	78 H	MOV A, B
0003 H	0000 0110	06 H	MVI B, 02H
	0000 0010	02 H	
0005 H	1001 0000	90 H	SUB B
0006 H	0011 0010	32 H	STA 003AH
	0011 1010	3A H	
	0000 0000	00H	
0009 H	0111 0110	76 H	HLT

c) Indirect addressing of two numbers using register pairs & storing the result in a memory location.



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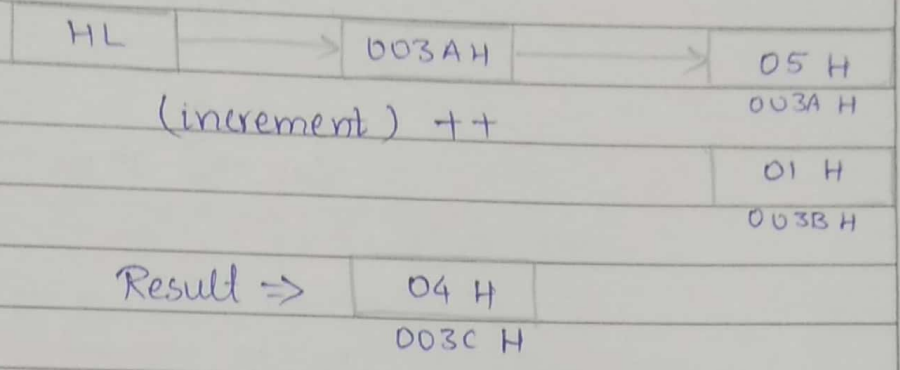
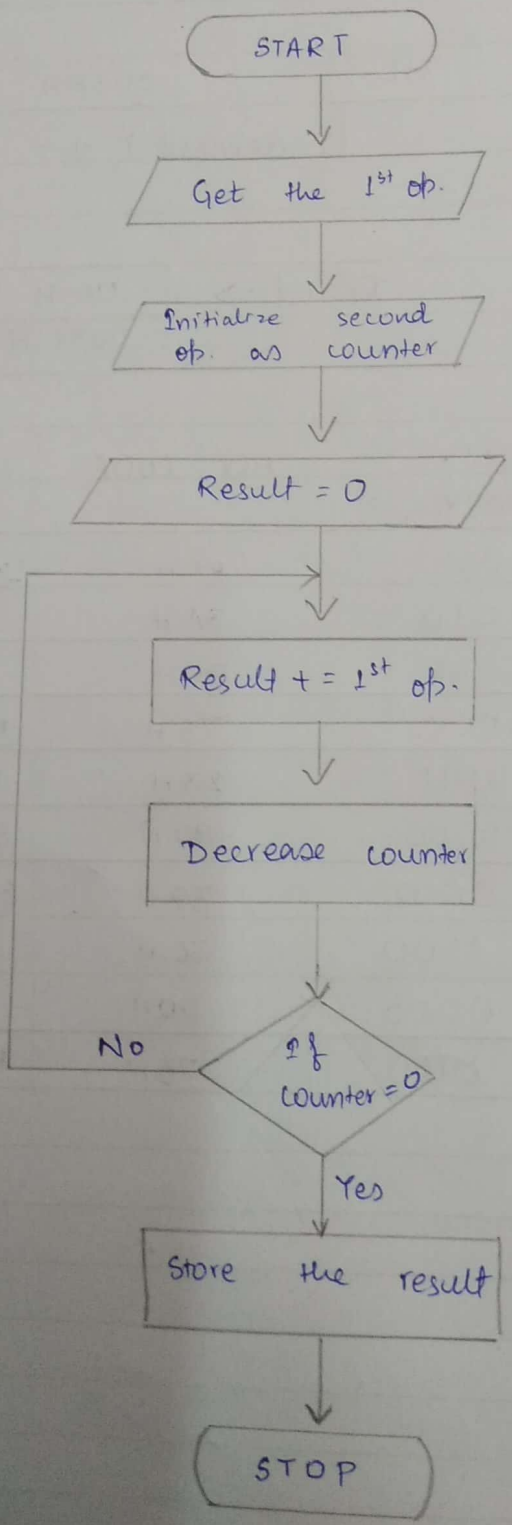
- CODE

```
LXI  H, 003A H
MOV  A, M
INX  H
SUB  M
STA  003C H
HLT
```

- SAMPLE PROBLEM



PROGRAM COUNTER	MAIN MEMORY	HEX. CODE	MNEMONICS
0000 H	0010 0001	21 H	LXI H, 003A H
	0010 1010	3A H	
	0000 0000	00H	
0003 H	0111 1000	78 H	MOV A, M
0004 H	0010 0011	23 H	INX H
0005 H	1001 0000	90 H	SUB M
0006 H	0011 0010	32 H	STA 003C H
	0011 1100	3C H	
	0000 0000	00H	
0009 H	0111 0110	76 H	HLT



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Q. Write an assembly language program to multiply two 8-bit numbers by

a) Using recursive addition :-

- CODE

```
LDA  2400H
MOV  B, A
LDA  2401H
MOV  D, A
LDA  2406H
ADD  D
DCR  B
JNZ  000BH
STA  240AH
HLT
```

- SAMPLE PROBLEM

Operand 1 ⇒ | 04 H | Value
2400 H (Add)

Operand 2 ⇒ | 05 H | Value
2401 H (Add.)

When B = 0004 H
D = D + 0005 H = 0005 H
B-- ; (Decrementing B)
when B = 0003H ; D = D + 0005H = 000AH

when B = 0000H ; D = 0014 H

Result ⇒ | 0014 H | value
240A H (Add.)

PROGRAM COUNTER	MAIN MEMORY	HEX CODE	MNEMONICS
0000 H	0011 1010	3AH	LDA 2400H
	0000 0100	04 H	
	0000 0000	00 H	
0003 H	0100 0111	47 H	MOV B, A
0004 H	0011 1010	3A H	LDA 2401 H

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~~0005 H~~	0000 0101	05 H	
	0000 0000	00 H	
0007 H	0100 0111	47 H	MOV D, A
0008 H	0011 1010	3A H	LDA 2406 H
	0010 0100 0000 0110	2406 H	
	0000 000	00 H	A
000B H	1000 0110	86 H	ADD D
000C H	0000 1011	0B H	DCR B
000D H	1100 0010	C2 H	JNZ 000BH
	0000 1011	0B H	
0010 H	0011 0010	32 H	STA 2408 H
~~0010 H~~	0010 0100 0000 1000	~~2408~~ H	~~STA 2408 H~~
	0000 0000	00 H	
0013 H	0111 0110	76 H	HLT