

LAB - 7

- Write an ALP to perform 8-bit addition.

Program :

```
MVI A 08h  
MVI B 07h  
ADD B  
STA 2050 H  
HLT
```

Address	Data
2000	3E
2001	08H
2002	06
2003	07H
2004	80
2005	32
2006	50
2007	20
2008	76

Result :-

$$2050 = 0Fh$$

Question 2 : Write an ALP to perform 8 bit Subtraction.

Program :

```
MVI A 09h  
MVI B 03h  
SUB B  
STA 2055H  
HLT
```

ADDRESS	Data
2000 H	3E
2001	09
2002	06
2003	03
2004	90
2005	32
2006	55
2007	20
2008	76

Output :

$$2055 = 06 \text{ h}$$

Question 3 : Write an ALP to perform
8 bit Multiplication.

Program :

MVI A 00h

MVI B 08h

MVI C 03h

Loop : ADD B

DCR C

JNZ Loop

MOU D A

HLT

ADDRESS	DATA
3000	3E
3001	00
3002	06
3003	08
3004	0E
3005	03
3006	80
3007	0D
3008	C2
3009	06
300A	30
300B	57
300C	76

Result :

D = 18h

Question 4: Write an ALP to Perform
16-bit addition.

Program
LHLD 3400h
XCMG
LHLD 3402h
DAD D
SHLD 3404
HLT

Memory ADDRESS	Opcode & Data	Input	Output
3400	2A	3400 = 34	
3401	00	3401 = 12	
3402	34	3402 = 25	
3403	E8	3403 = 78	
3404	2A		3404 = 59
3405	02		3405 = 8A
3406	34		
3407	19		
3408	22		
3409	04		
340A	34		
340B	76		

Question 5 : Write an ALP program of 8 bit number for I's complement

Program :

LDH C050H

CMA

STA C059H

HLT

Memory Address

Opcode & Data

C080 3A

C081 50

C082 C0

C083 2F

C084 32

C085 59

C086 C0

C087 76

Input	Output
C050	OF
C059	FO

Q.N 6 : Write an ALP to perform logical AND operation

Program
MVI A 09H
MVI B 07H
ANA B
STA 2050
HLT

Memory Address	Opcode & Data	
3000	3E	<u>Input:</u>
3001	09	A = 09H
3002	08	B = 07H
3003	07	<u>Output:</u>
3004	A0	2050 = 01H
3005	32	
3006	50	
3007	20	
3008	76	

QN 7 : Write an ALP to perform logical OR operation between two 8 bit dat

Program
MVI A 03h
MVI B 02h
OR A B
STA 2050h
HLT

Memory Address	Opcod & Data
3001	3E
3002	03
3003	06
3004	02
3005	30
3006	32
3007	50
3008	20
3009	76

Input :

A = 03h

B = 02h

Output :

2050 = 05h

QN8 : Write an ALP to perform logical XOR operation between 2, 8 bit data

Program:

MVI A 05h
MVI B 03h
XRA B
STA 2050h
HLT

Memory Address	Opcode & Data
300 1	3E
300 2	05
300 3	06
300 4	03
300 5	A8
300 6	32
300 7	50
300 8	20
300 9	76

Input:

A = 05h

B = 03h

Output:

2050 = 08h

QNG: Write an ALP to find Largest of two number 1st in C001 and 2nd in C002 and store the result in C003.

Program:

```
LXI H, C001H  
MOVA, M  
INX H  
CMP M  
JNC Loop  
MOVA, M  
Loop: STA C003H  
HLT
```

Memory Address	opcode & Data
2000	21
2001	01
2002	C0
2003	7E
2004	23
2005	BE
2006	D2
2007	0A
2008	7E
2009	12
200A	32
200B	03
200C	C0
200D	76

Input:

C001 = 08H

C002 = 09H

Output:

C003 = 09H

Q.N 10: Write an ALP to find the number is odd or Even.

Program :

```
MVI A, 03H  
ANI 01H  
JZ X  
MVI A, 11H //For odd  
JMP Y  
X: MVI A, 22H //Even  
Y: STA 2050H  
HLT
```

Memory Address	Opcode & Data
0000	3E
0001	03
0002	E6
0003	01
0004	CA
0005	0B
0006	C3
0007	OD
0008	3E
0009	22
000B	32
000C	50
000D	20
000E	76

Input :

A = 03 H

Output :

2050 = 11 H

Q. NII: Write an ALP to find the smallest no in a data array. Data from location COOH to C005 H

Program:
LXI H, C000H
MVI C, 06H
MOV A, M
DCR C
LOOP: INX H
CMP M
JC LOOPZ
MOVA, M
LOOP1: DCR C
JNZ LOOP
STA COOH
HLT

Memory Address	Value
0000	21
0002	C0
0003	OE
0004	06
0005	7E
0006	0D
0007	23
0008	BE
0009	DA
000A	0D
000C	7E
000D	0D
000E	C2
000F	07
CO01	32
CO02	C0
CO03	C0
CO04	76

Input:

C000 = 02

C001 = 01

C002 = 04

C003 = 08

C004 = 09

C005 = 05

Output:

CO00 = 01

12. The following block of data of data is stored in memory location from C055 to C05A H. Transfer the entire block of data to the locations C080 to C085H. In reverse order.
Data: 22, A5, B2, 99 7F, 3F

Program :

LXI H, C055 H

LXI D, C085H

MVI B, 06H

NEXT: MOVA,M

STAX D

INX H

DCX D

DCR B

JNZ NEXT

HLT

Note: We don't write the memory address for 00H in value but we write in hexacode.

Memory ADDRESS	Values
0000	21
0001	55
0002	C0
0003	71
0004	85
0005	C0

0006	06
0007	06
0008	7E
0009	12
000A	23
000B	1B
000C	05
000D	C2
000E	08
0010	76

Input :

C055 = 22

C056 = A5

C057 = B2

C058 = 99

C059 = 7F

C05A = 3F

Output :

C081 = 3F

C082 = 7F

C083 = 99

C084 = B2

C085 = A5

C086 = 22

3. Write an ALP to find the 2's complement

Program:

LDA C050 H

CMA

INR A

STA, C051 H

HLT

Memory ADDRESS	Opcode & Data
0000	3A
0001	50
0002	C0
0003	2F
0004	3C
0005	32
0006	51
0007	C0
0008	76

Input :

$$C050 = 11H$$

Output :

$$C051 = EF$$

Q.N 14: Write an ALP to count the no of 1's in the given string "10100 and display the result at COCOH

Program:

```
MVI A, A6H  
MVI B, 00H  
MVI C, 08H  
LOOP1: RAL  
        JNC Loop2  
        INR B  
LOOP2: DCR C  
        JNZ LOOP1  
        MOV A, B  
        STA COCOH  
        HLT
```

Memory Address	Opcode & Data
0000	3E
0001	A6
0002	06
0003	00
0004	OE
0005	08
0006	17
0007	D2
0008	0B
0009	00
000A	04
000B	0D
000C	C2
000D	06
000E	00
000F	78
0010	32
0011	C0
0012	C0
0013	76

Input:

A6 = 10100110

Output:

COCO = 4

Q.N 15: The following data are stored in memory location starting from COBO to CO B5 H. Take a test no 48. find out how many times the no 48 is repeated. Display the result at COCOH. Data : 32, 15, 48, 48, 58, 48

Program

```

LXI H, COBO H
MVI B, 00 H
MVI C, 06 H
LOOP1: MOV A, M
        CPI 48 H
        JNZ LOOP2
        INR B
LOOP2: INX H
        DCR C
        JNZ LOOP1
        MOV A, B
        STA COCOH
        HLT
    
```

Memory Address	Data & Opcode
0000	21
0001	30
0002	C0
0003	06
0004	00
0005	0E

0006	06	
0007	7E	
0008	FE	
0009		
000A	48	<u>Input:</u>
	C2	$COB0 = 12$
000B	0E	$COB1 = 15$
000C	00	
000D	04	$COB2 = 48$
000E	23	$COB3 = 48$
000F	09	
0010	C2	$COB4 = 58$
0011	07	$COB5 = 48$
0012	00	<u>Output:</u>
0013	78	
0014	32	$COCO = 3$
0015	C0	
0016	C0	
0017	78	

Q.N16: A program to find the factorial
'n' number.

Program:

```
MVI B, 04H
MOV C, B
DCR C
LOOP1: MOVE, C
SUB A
LOOP2: ADD B
DCRE
JNZ LOOP2
MOV B, A
DCR C
JNZ LOOP1
STA 8000H
HLT
```

Input:

$$B = 04$$

Output:

$$8000 = 18$$

Memory Address	Opcode & Data
0000	06
0001	04
0002	48
0003	0D
0004	59
0005	97
0006	80
0007	ID
0008	C2
0009	06
000A	00
000B	47
000C	0D
000D	C2
000E	04
000F	00
0010	32
0011	00
0012	80
0013	76

Note: The value of decimal 24 is 18.

QN 17 : Write an ALP to perform 8-bit Division

Program :

MVI A, 08H
MVI B, 03H
MVI C, 00H

X : CMP B

SC Y

SUB B

INR C

JMP X

Y : STA 2056 H

MOVA, C

STA 2057 H

HLT

Input :

A = 08H

B = 03H

Output :

2056 = 02 (remainder)

2057 = 02 (result)

ADDRESS	Data
2000	3E
2001	08
2002	06
2003	03
2004	0E
2005	00
2006	08
2007	DA
2008	0F
2009	20
200A	90
200B	0C
200C	C3
200D	06
200E	20
200F	32
2010	56
2011	20
2012	79
2013	32
2014	57
2015	20
2016	76

QN: 18) Write a program to mask the high-order bits (D7-D4) and display the low order bit (D3-D0) at '2050'. Exclusive-OR the result with 57.

Program :

```
MVI C,A8H
MOVA,C
ANI 0FH
STA 2050
XRI 57H
STA 2051
HLT
```

Memory Address

0000

0001

0002

0003

0004

0005

0006

0007

0008

0009

000A

000B

000C

000D

Data & Opcode

OE

A8

79

E6

OF

32

50

20

EE

57

32

51

20

76

Input :

C = A8 H

Output :

2050 = 08

2051 = 57 (X-OR)

Q.N 19: WAP to load the byte 8EH in register D and F7H in register E. Make the higher order bits (D7-D4) maskable from both the data bytes, EX-OR the low order bits (D3-D0) and display the answer.

Program:

```
MVI D, 8EH  
MOV A, D  
ANI 0FH  
MVI D, 8EH  
MVI E, F7H  
MOUD, A  
MOV A, E  
ANI 0FH  
XRA D  
STA 2050 H  
HLT
```

Memory Address	Opcode & Data
0000	36
0001	8E
0002	7A
0003	E6

0004
0005
0006
0007
0008
0009
000A
000B
000C
000D
000E
000F
0010
0011

0F
16
8E
1E
F7
57
7B
E6
0F
AA
32
50
20
76

Input:

$$D = 8E$$

$$E = F7$$

Output:

$$2050 = 09$$

Q.N 20

WAP to add Series of number

Program :

MVI A, 00H

MVI B, 04H

LOOP1: MOV C, B

LOOP2: ADD B

DCR C

JNZ LOOP2

DCR B

JNZ LOOP1

STA 2050H

HLT

Memory Address	Opcode & Data
0000	3E
0001	00
0002	06
0003	04
0004	48
0005	80
0006	00
0007	00
0008	C2
0009	05
000A	00
000B	05
000C	C2
000D	04
000E	32
000F	50
0010	20
	76

Input:

0010 = 01
 0011 = 02
 0012 = 03
 0013 = 01

Output:

2050 = 07