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Practical No:-1

Aim :-To learn and Perform addition operation for two 8-bit; sum is 8-bit and 16 bit respectively.

Apparatus :- 8085 Kit /GNUsim8085 software.

Program:-

Memory address	Opcode	Mnemonics	Comment
0800	3E 90	MVI A,90h	Place 1st number in accumulator
0802	C6 90	ADI 90h	Add 2nd number to accumulator & store the result in accumulator
0804	0E 00	MVI C,000h	Store value 00 in Register C
0806	32 00 00	STA 0000h	Store the content of Accumulator to address 0000
0809	D2 0d 08	JNC Loc1	Jump to Loc1 if No carry.
080C	0C	INR C	Increment the value of Register C by 1.
080D	79	Loc1:MOV A,C	Shift contents of register C to accumulator.
080E	32 01 00	STA 0001h	Store the contents of Accumulator to address 0001.
0811	76	HLT	End of Program.

Procedure:-

1. Switch on the power supply and kit will display “UP 8085”.
2. Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3. To execute the program press Reset ~ go ~ starting address ~ execute buttons
4. To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result 20 H at the memory address 0000H and carry 01H at the memory address 0001H , which is the addition of 90H and 90H.

Memory View 0x 8000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
000	20	01	00	00	00	00	00	00	00	00	00	00	00	00	00	00
001	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
002	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Assembler Output

```
1  3E 90          MVI A,90h
2  C6 90          ADI 90h
3  0E 00          MVI C,000h
4  32 00 00       STA 0000h
5  D2 0d 08       JNC Loc1
6  0C             INR C
7  79             Loc1:MOV A,C
8  32 01 00       STA 0001h
9  76             HLT
```

Practical No:-02

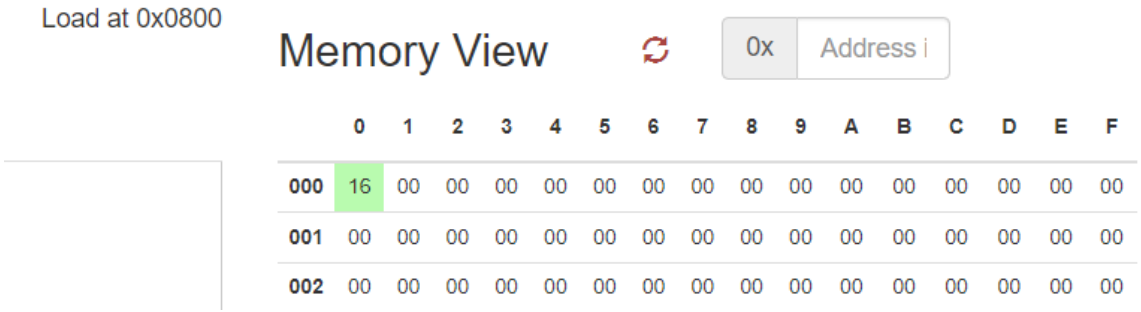
Aim :- Perform subtraction operation of two 8-bit and 16-bit numbers.
Apparatus :- 8085 Kit /GNUsim8085 software.
Program:-

Memory address	Op code(HEX)	Mnemonics	Comment
0800	3E 56	MVI A,56h	Place 1st number in accumulator
0802	06 40	MVI B,40h	Place 2nd number in register B
0804	90	SUB B	Subtract B from accumulator and store result inaccumulator.
0806	32 00 00	STA 0000h	Store the content of Accumulator to address 0000.
0809	76	HLT	End of Program.

Procedure:-
1.Switch on the power supply and kit will display “UP 8085”.
2.Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3.To execute the program press Reset ~ go ~ starting address ~ execute buttons
4.To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result 16 H at the memory address 0000H , which is the subtraction of 56H and 40H.



Assembler Output

1	3E 56	MVI A,56h
2	06 40	MVI B,40h
3	90	SUB B
4	32 00 00	STA 0000h
5	76	HLT

Practical No:-03

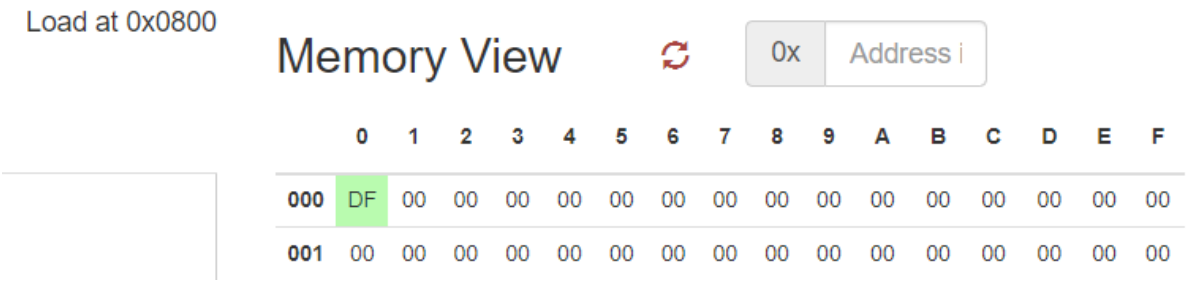
Aim :- Find 1's complement of 8 bit number.
Apparatus :- 8085 Kit /GNUsim8085 software.
Program:-

Memory address	Op code	Mnemonics	Comment
0800	3E 20	MVI A ,20h	Place 1st numbet in accumulator
0802	2F	CMA	Complement the content of accumulator
0804	32 00 00	STA 0000h	Store the content of accumulator to address 0000
0806	76	HLT	End of the program

Procedure:-
1. Switch on the power supply and kit will display "UP 8085".
2. Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3. To execute the program press Reset ~ go ~ starting address ~ execute buttons
4. To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result DF H at the memory address 0000H address , which is the 1's complement of 20H.



Assembler Output

1	3E 20	MVI A ,20h
2	2F	CMA
3	32 00 00	STA 0000h
4	76	HLT

Practical No:-04

Aim :- Find 1's complement of 16 bit number.
Apparatus :- 8085 Kit /GNUsim8085 software.
Program:-

Memory address	Op code	Mnemonics	Comment
0800	3E 25	MVI A,25h	Place 1st number(MSB) in accumulator
0802	32 00 00	STA 0000h	Store the content of accumulator at adddress 0000
0805	3E 26	MVI A,26h	Place 2nd number(LSB) in accumulator
0807	32 01 00	STA 0001h	Store the content of accumulator at adddress 0001
080A	2A 00 00	LHLD 0000h	Load H-L pair with address 0000.
080D	7C	MOV A,H	Place content of H in accumulator.
080E	2F	CMA	Complement the content of accumulator.
080F	67	MOV H,A	Move the content of accumulator in register H.
0810	7D	MOV A,L	Move the content of register L to accumulator.
0811	2F	CMA	Complement the content of accumulator.
0812	6F	MOV L,A	Move the content of accumulator in register L.
0813	22 20 00	SHLD 0020h	Store the content of H-L pair at address 0020.
0816	76	HLT	End of the program.

Procedure:-
1. Switch on the power supply and kit will display "UP 8085".
2. Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3. To execute the program press Reset ~ go ~ starting address ~ execute buttons
4. To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result DAD9 H at the memory address 0020H address , which is the 1's complement of 2526H.

Memory View

0x Address i

	0	1	2	3	4	5	6	7	8	9	A	B
000	25	26	00	00	00	00	00	00	00	00	00	00
001	00	00	00	00	00	00	00	00	00	00	00	00
002	DA	D9	00	00	00	00	00	00	00	00	00	00

Assembler Output

```
1    3E 25          MVI A,25h
2    32 00 00       STA 0000h
3    3E 26          MVI A,26h
4    32 01 00       STA 0001h
5    2A 00 00       LHLD 0000h
6    7C             MOV A,H
7    2F             CMA
8    67             MOV H,A
9    7D             MOV A,L
10   2F             CMA
11   6F             MOV L,A
12   22 20 00       SHLD 0020h
13   76             HLT
14
```

Practical No:-05

Aim :- Find 2's complement of 8 bit number.
Apparatus :- 8085 Kit /GNUsim8085 software.
Program:-

Memory address	Op code	Mnemonics	Comment
0800	3E 20	MVI A ,20h	Place 1st numbet in accumulator
0802	2F	CMA	Complement the content of accumulator
0804	32 00 00	STA 0000h	Store the content of accumulator to address 0000
0806	C6 01	ADI 01	Add 1 to content of accumulator.
0809	32 01 00	STA 0001h	Store the contents of accumulator to address 0001.
080C	76	HLT	End of the program

Procedure:-
1. Switch on the power supply and kit will display "UP 8085".
2. Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3. To execute the program press Reset ~ go ~ starting address ~ execute buttons
4. To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result DF H at the memory address 0000H address and E0 at memory address 0001H , which is the 2's complement of 20H.

Memory View 0x 8000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
000	DF	E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00
001	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
002	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Assembler Output

1	3E 20	MVI A ,20h
2	2F	CMA
3	32 00 00	STA 0000h
4	C6 01	ADI 01
5	32 01 00	STA 0001h
6	76	HLT

Practical No:-06

Aim :- Find 2's complement of 16 bit number.

Apparatus :- 8085 Kit /GNUsim8085 software.

Program:-

Memory address	Op code	Mnemonics	Comment
0800	3E 26	MVI A,26h	Place 1st no (LSB) to accumulator
0802	32 00 00	STA 0000h	Store the content of accumulator to address 0000
0805	06 00	MVI B,00h	Move value 00 in register B.
0807	3E 4f	MVI A,4Fh	Place 2nd no (MSB) to accumulator
0809	32 01 00	STA 0001h	Store the content of accumulator to address 0001
080C	21 00 00	LXI H,0000h	Load H-L pair with adderss 0000.
080F	7E	MOV A,M	Move the LSB to accumulator
0810	2F	CMA	Complement the content of accumulator
0811	C6 01	ADI 01h	Add 1 to accumulator.
0813	32 21 00	STA 0021h	Store the content of accumulator to address 0021
0816	D2 1a 08	JNC L1	Jump direct to L1 if there is no Carry.
	04	INR B	Increment in the value of register B.
081A	21 01 00	L1:LXI H,0001h	Load H-L pair with adderss 0001.
081D	7E	MOV A,M	Move the MSB to accumulator
081E	2F	CMA	Complement the content of accumulator
081F	80	ADD B	Add the content of register B to accumulator.
0820	32 20 00	STA 0020h	Store the content of accumulator to address 0021
0823	76	HLT	End of program.

Procedure:-

1. Switch on the power supply and kit will display “UP 8085”.
2. Press reset ~examine memory ~ program starting memory address ~ next ~ opcode ~ next and so on up to the end of program opcodes.
3. To execute the program press Reset ~ go ~ starting address ~ execute buttons
4. To check the result press Reset ~ examine memory~Memory address(where the result has beenstored in program) ~Next.

Result:-

We have seen the result B0DA H at the memory address 0020H address , which is the 1’s complement of 4F26H.

Memory View

0x Address i

	0	1	2	3	4	5	6	7	8	9	A	B	C
000	26	4F	00	00	00	00	00	00	00	00	00	00	00
001	00	00	00	00	00	00	00	00	00	00	00	00	00
002	B0	DA	00	00	00	00	00	00	00	00	00	00	00

Assembler Output

```
1   3E 26          MVI A,26h
2   32 00 00       STA 0000h
3   06 00          MVI B,00h
4   3E 4f          MVI A,4Fh
5   32 01 00       STA 0001h
6   21 00 00       LXI H,0000h
7   7E             MOV A,M
8   2F             CMA
9   C6 01          ADI 01h
10  32 21 00       STA 0021h
11  D2 1a 08       JNC L1
12  04             INR B
13  21 01 00       L1:LXI H,0001h
14  7E             MOV A,M
15  2F             CMA
16  80             ADD B
17  32 20 00       STA 0020h
18  76             HLT
```

Practical No:-07

Aim :- Find sum of series of 8 bit numbers

Apparatus :- 8085 Kit /GNUsim8085 software.

Program:-

Memory address	Op code(HEX)	Mnemonics	Comment
8000	3E 04	MVI A,04h	Place the number i.e.count of numbers which we want to add in accumulator.
8002	32 00 00	STA 0000h	Store the content of accumulator to adderss 0000.
8005	3E 05	MVI A,05h	Place 1st number in accumulator.
8007	32 01 00	STA 0001h	Store the content of accumulator to adderss 0001.
800A	3E 09	MVI A,09h	Place 2nd number in accumulator.
800C	32 02 00	STA 0002h	Store the content of accumulator to adderss 0002.
800F	3E 52	MVI A,52h	Place 3rd number in accumulator.
8011	32 03 00	STA 0003h	Store the content of accumulator to adderss 0003.
8014	3E 80	MVI A,80h	Place 4th number in accumulator.
8016	32 04 00	STA 0004h	Store the content of accumulator to adderss 0004.
8019	21 00 00	LXI H,0000	Load H-L pair with adderss 0000.
801C	4E	MOV C,M	Move the counter form memory to register C
801D	3E 00	MVI A,00	Initilize the value of A with 00**.**
801F	06 00	MVI B,00	Initilize the value of A with 00**.**
8021	21 01 00	LXI H,0001	Load H-L pair with adderss 0001.
8024	86	Loc1: ADD M	Add the value of memory pointer to accumulator
8025	D2 29 08	JNC Loc2	Jump directly at Loc2 if No carry
8029	04	INR B	Increment the value of register B
802A	23	Loc2: INX H	Increment of H-L pair.
802B	0D	DCR C	Decrement the value of register C.
802E	C2 24 08	JNZ Loc1	Jump directly at Loc1 if value of register is Non Zero.
8031	32 08 00	STA 0008	Store the content of accumulator to adderss 0008.
8032	78	MOV A,B	Move the content of register B to accumulator.
8035	32 09 00	STA 0009	Store the content of accumulator to adderss 0009.
8036	76	HLT	End of the program.

Result:-

We have seen the result E0 H at the memory address 0008H address and 00 at memory address 0009H because there is no carry.

Load at 0x0800

Memory View

0x Address i

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
000	04	05	09	52	80	00	00	00	E0	00	00	00	00	00	00	00
001	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
002	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
003	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Assembler Output

```
1   3E 04          MVI A,04h
2   32 00 00       STA 0000h
3   3E 05          MVI A,05h
4   32 01 00       STA 0001h
5   3E 09          MVI A,09h
6   32 02 00       STA 0002h
7   3E 52          MVI A,52h
8   32 03 00       STA 0003h
9   3E 80          MVI A,80h
10  32 04 00       STA 0004h
11
12  21 00 00       LXI H,0000
13  4E             MOV C,M
14  3E 00          MVI A,00
15  06 00          MVI B,00
```

```
16    21 01 00          LXI H,0001
17    86                Loc1: ADD M
18    D2 29 08          JNC Loc2
19    04                INR B
20    23                Loc2: INX H
21    0D                DCR C
22    C2 24 08          JNZ Loc1
23    32 08 00          STA 0008
24    78                MOV A,B
25    32 09 00          STA 0009
26    76                HLT
```