

MIT Practicals
Assignment 3
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Question 1: Store the data byte 32H into memory location 4000H.

Load me at

```
1
2 ;<Question 1>
3
4 jmp start
5
6 ;data
7
8
9 ;code
10 start: nop
11 lxi h,4000h
12 mvi m,32h
13 hlt
```

Data Stack AL KeyPad Memo

Start 4000h

Address (Hex)	Address	Data
4000	16384	50
4001	16385	0
4002	16386	0
4003	16387	0
4004	16388	0
4005	16389	0
4006	16390	0
4007	16391	0
4008	16392	0
4009	16393	0
400A	16394	0

Line No

Assembler Message

0

Program assembled successfully

Question 2: Exchange the contents of memory location 2000H and 4000H.

```
1
2
3
4 jmp start
5
6 ;data
7
8
9 ;code
10 start: nop
11 lxi h,4000h
12 mov b,m
13 xchg
14 lxi h,2000h
15 mov a,m
16 mov m,b
17 xchg
18 mov m,a
19 hlt
```

Start 4000h

Address (Hex)	Address	Data
4000	16384	32
4001	16385	0
4002	16386	0
4003	16387	0
4004	16388	0
4005	16389	0
4006	16390	0
4007	16391	0
4008	16392	0
4009	16393	0
400A	16394	0

Line No

Assembler Message

0

Program assembled successfully

Question 3: Add two 8-bit numbers: Add the contents of memory locations 4000H and 4001H and place the result in memory location 4002H.

Start		4000h	
Address (Hex)	Address	Data	
4000	16384	32	
4001	16385	48	
4002	16386	80	
4003	16387	0	
4004	16388	0	
4005	16389	0	
4006	16390	0	
4007	16391	0	
4008	16392	0	
4009	16393	0	
400A	16394	0	

Line No	Assembler Message
0	Program assembled successfully

Question 4: Subtract two 8-bit numbers: Subtract the contents of memory location 4001H from the memory location 2000H and place the result in memory location 4002H.

Start		4000h	
Address (Hex)	Address	Data	
4000	16384	20	
4001	16385	0	
4002	16386	30	
4003	16387	0	
4004	16388	0	
4005	16389	0	
4006	16390	0	
4007	16391	0	
4008	16392	0	
4009	16393	0	
400A	16394	0	

Line No	Assembler Message
0	Program assembled successfully

Question 5:Add the 16-bit number in memory locations 4000H and 4001H to the 16-bit number in memory locations 4002H and 4003H. The most significant eight bits of the two numbers to be added are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.

```
1
2
3
4  jmp start
5
6  ;data
7
8
9  ;code
10 start: nop
11  lda 4000h
12  mov b,a
13  lda 4002h
14  add b
15  sta 4004h
16  lda 4001h
17  mov b,a
18  lda 4003h
19  adc b
20  sta 4005h
21  hlt
22
```

Start 4000h

Address (Hex)	Address	Data
4000	16384	20
4001	16385	15
4002	16386	30
4003	16387	11
4004	16388	50
4005	16389	26
4006	16390	0
4007	16391	0
4008	16392	0
4009	16393	0
400A	16394	0

Line No	Assembler Message
0	Program assembled successfully

Question 6: Add contents of two memory locations: Add the contents of memory locations 4000H and 4001H and place the result in the memory locations 4002H and 4003H.

1
2
3
4 jmp start
5
6 ;data
7
8
9 ;code
10 start: nop
11 lda 4000h
12 mov h,a
13 lda 4001h
14 add h
15 mov l,a
16 mvi a,0
17 adc a
18 mov h,a
19 shld 4002h
20 hlt
21

Start4000h

Address (Hex)	Address	Data
4000	16384	150
4001	16385	212
4002	16386	106
4003	16387	1
4004	16388	1
4005	16389	26
4006	16390	0
4007	16391	0
4008	16392	0
4009	16393	0
400A	16394	0

Line No	Assembler Message
0	Program assembled successfully

Question7: Write a program for one's complement of an 8 bit number.

1
2
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```
jmp start  
  
;data  
  
;code  
start: nop  
lda 4000h  
cma  
sta 4001h  
hlt
```

Start4000h

Address (Hex)	Address	Data
4000	16384	16
4001	16385	239
4002	16386	0
4003	16387	0
4004	16388	0
4005	16389	0
4006	16390	0
4007	16391	0
4008	16392	0
4009	16393	0
400A	16394	0

Line No	Assembler Message
0	Program assembled successfully

Question 8: Write a program for two's complement of an 8 bit number.

1		Start	4000h
2			
3		Address (Hex)	Address Data
4	jmp start	4000	16384 16
5		4001	16385 240
6	;data	4002	16386 0
7		4003	16387 0
8		4004	16388 0
9	;code	4005	16389 0
10	start: nop	4006	16390 0
11	lda 4000h	4007	16391 0
12	cma	4008	16392 0
13	inr a	4009	16393 0
14	sta 4001h	400A	16394 0
15	hlt		
16			
	Line No	Assembler Message	
	0	Program assembled successfully	

Question 9: Subtract the 16-bit number in memory locations 4002H and 4003H from the 16-bit number in memory locations 4000H and 4001H. The most significant eight bits of the two numbers are in memory locations 4001H and 4003H. Store the result in memory locations 4004H and 4005H with the most significant byte in memory location 4005H.

1		Start	4000h
2			
3		Address (Hex)	Address Data
4	jmp start	4000	16384 12
5		4001	16385 14
6	;data	4002	16386 7
7		4003	16387 20
8		4004	16388 251
9	;code	4005	16389 5
10	start: nop	4006	16390 0
11	lhld 4002h	4007	16391 0
12	xchg	4008	16392 0
13	lhld 4000h	4009	16393 0
14	mov a,e	400A	16394 0
15	sub l		
16	sta 4004h		
17	mov a,d		
18	sbb h		
19	sta 4005h		
20	hlt		
21			
	Line No	Assembler Message	
	0	Program assembled successfully	

Question 10: Write a program using the ADI instruction to add the two hexadecimal numbers 3AH and 48H and store the result in memory location 2100H.

1
2
3
4 `jmp start`
5
6 `;data`
7
8
9 `;code`
10 `start: nop`
11 `mvi a, 3ah`
12 `adi 48h`
13 `sta 2100h`
14 `hlt`
15

Start 2100h

Address (Hex)	Address	Data
2100	8448	130
2101	8449	0
2102	8450	0
2103	8451	0
2104	8452	0
2105	8453	0
2106	8454	0
2107	8455	0
2108	8456	0
2109	8457	0
210A	8458	0

Line No	Assembler Message
0	Program assembled successfully

Question 11: Write an assembly language program that AND, OR and XOR together the contents of register B, C and E and place the result into memory location 3000H, 3001H and 3002H.

```
1  jmp start
2
3  ;data
4
5
6  ;code
7  start: nop
8  mvi b,20h
9  mvi c,30h
10 mvi d,25h
11
12 mov a,b
13 ana c
14 ana d
15 sta 3000h
16
17 mov a,b
18 ora c
19 ora d
20 sta 3001h
21
22 mov a,b
23 xra c
24 xra d
25 sta 3002h
26 hlt
27
```

Start 3000H

Address (Hex)	Address	Data
3000	12288	32
3001	12289	53
3002	12290	53
3003	12291	0
3004	12292	0
3005	12293	0
3006	12294	0
3007	12295	0
3008	12296	0
3009	12297	0
300A	12298	0

Line No	Assembler Message
0	Program assembled successfully

Question 12: Program to Find 1's Complement of 16-bit Number.

<pre>1 jmp start 2 3 ;data 4 5 6 ;code 7 start: nop 8 lhld 3000h 9 mov a,h 10 cma 11 mov h,a 12 mov a,l 13 cma 14 mov l,a 15 shld 3002h 16 hlt 17</pre>	Start 3000h																																					
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Question 13: Program to Find 2's Complement of 16-bit Number.

<pre>1 jmp start 2 3 ;data 4 5 6 ;code 7 start: nop 8 lhld 3000h 9 mov a,h 10 cma 11 mov h,a 12 mov a,l 13 cma 14 mov l,a 15 inc h 16 shld 3002h 17 18 hlt 19</pre>	Start 3000h																																					
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