M.I.T. LAB Assignment – 07

U19CS012

(1) A string of readings is stored in memory, locations starting at 2070H, and the end of the string is indicated by the byte 0DH.
WAP to check each byte in the string, and the save the bytes in the range of 30H to 39H (both inclusive) in memory locations starting from 2090H.

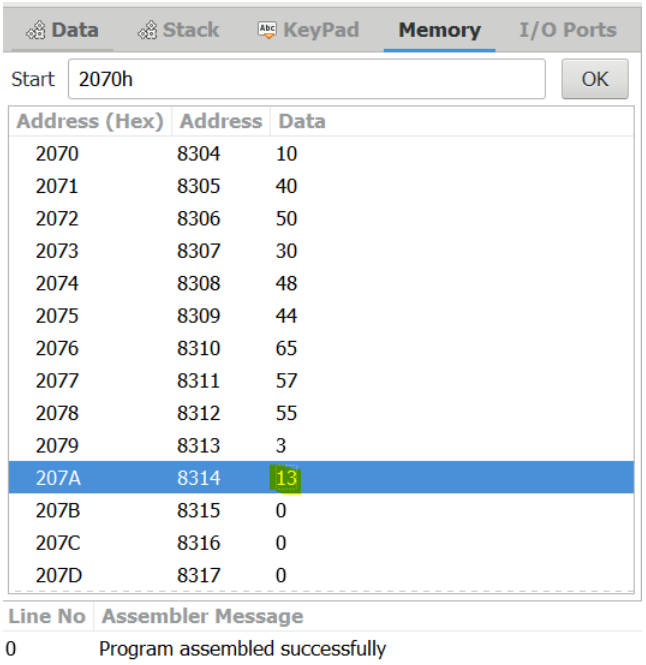
Notepad Code:

```
LXI H, 2070H
LXI D, 2090H
; Intialise it with 30H-1 = 2FH
MVI B, 2FH

LOOP: MVI A, 0DH
        CMP M
        JZ exit
        MOV A, B
        CMP M
        JC ok1
        INX H
        JMP LOOP

exit: HLT

; 30H <= M [Checks]
ok1: MOV A, M
      CPI 3AH
      JC ok2
      INX H
      JMP LOOP

; M <= 39H [Check]
ok2: MOV A, M
      STAX D
      INX D
      INX H
      JMP LOOP
```

Test Case:

Input : [10, 40, 50, 30, 48, 44, 65, 57, 55, 3, 13]

Output : Numbers 48 <= x <= 57 [50,48,57,55]

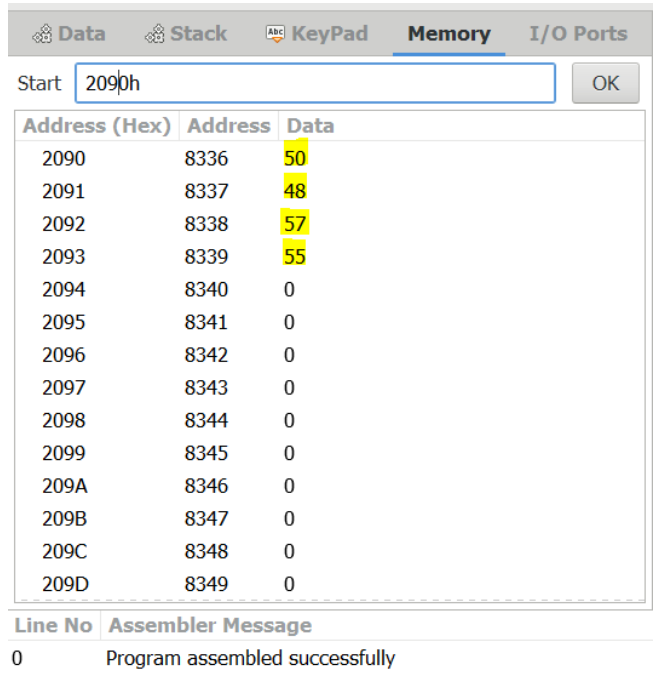


Data | Stack | KeyPad | Memory | I/O Ports

Start 2070h OK

Address (Hex)	Address	Data
2070	8304	10
2071	8305	40
2072	8306	50
2073	8307	30
2074	8308	48
2075	8309	44
2076	8310	65
2077	8311	57
2078	8312	55
2079	8313	3
207A	8314	13
207B	8315	0
207C	8316	0
207D	8317	0

Line No	Assembler Message
0	Program assembled successfully



Data | Stack | KeyPad | Memory | I/O Ports

Start 2090h OK

Address (Hex)	Address	Data
2090	8336	50
2091	8337	48
2092	8338	57
2093	8339	55
2094	8340	0
2095	8341	0
2096	8342	0
2097	8343	0
2098	8344	0
2099	8345	0
209A	8346	0
209B	8347	0
209C	8348	0
209D	8349	0

Line No	Assembler Message
0	Program assembled successfully

(2) A set of ten bytes is stored in memory starting with the address 2050H. Write a program to check each byte , and save the bytes that are higher than 6010 and lower than 10010 in memory locations starting from 2060H.

Notepad Code:

```
;A set of ten bytes is stored in memory starting with the address 2050H.
; WAP to check each byte ,  and
; save the bytes that are higher than 60and lower than 100 in memory locations starting from 2060H.

; [U19CS012] [BHAGYA VINOD RANA]

LXI H, 2050H
LXI D, 2060H
MVI B, 3BH
MVI C, 0AH
MVI A, 00H

LOOP:  MOV A, B
       CMP M
       JC ok1
       INX H
       DCR C
       JNZ LOOP
       JMP exit

exit: HLT
```

```
exit: HLT

; 3CH (60) <= M [Checks]
ok1: MOV A, M
        CPI 65H
        JC ok2
        INX H
        DCR C
        JNZ LOOP
        JMP exit

; M <= 65H (100) [Checks]
ok2: MOV A, M
        STAX D
        INX D
        INX H
        DCR C
        JNZ LOOP
        JMP exit
```

Test Case:

Input : [10, 20, 30, 50, 48, 75, 100, 105, 45, 85, 66]

Output : Numbers 60 <= x <= 100 [75,100,85,66]

Data | Stack | KeyPad | Memory | I/O Ports

Start 2050h OK

Address (Hex)	Address	Data
2050	8272	10
2051	8273	20
2052	8274	30
2053	8275	55
2054	8276	75
2055	8277	100
2056	8278	105
2057	8279	45
2058	8280	85
2059	8281	66
205A	8282	0
205B	8283	0
205C	8284	0
205D	8285	0

Line No	Assembler Message
0	Program assembled successfully

Data | Stack | KeyPad | Memory | I/O Ports

Start 2060h OK

Address (Hex)	Address	Data
2060	8288	75
2061	8289	100
2062	8290	85
2063	8291	66
2064	8292	0
2065	8293	0
2066	8294	0
2067	8295	0
2068	8296	0
2069	8297	0
206A	8298	0
206B	8299	0
206C	8300	0
206D	8301	0

Line No	Assembler Message
0	Program assembled successfully

(3) Data bytes are stored in memory locations from 2050H to 205FH.To insert an additional five bytes of data, It is necessary to shift the data string by five memory locations. Write a program to store the data string from 2055H to 2064H.Use any sixteen bytes of data to verify your program.

Notepad Code:

```
; Q-(3) Data bytes are stored in memory locations from 2050H to 205FH.
; To insert an additional five bytes of data, It is necessary to shift the data string by five memory locations.
; WAP to store the data string from 2055H to 2064H.
; Use any sixteen bytes of data to verify your program.

; [U19CS012] [BHAGYA VINOD RANA]

LXI H, 205FH      ;Last location of our intial bytes
LXI D, 2064h      ;Last Location of our final bytes i.e.after shifting
MVI B, 016h       ; Total number of elements (22)

LOOP: MOV A, M        ; Move to Acc. A from memory
      STAX D          ; Store it to new required location
      DCX H           ; Previous Memory Location
      DCX D           ; Previous Memory Location
      DCR B           ; Decrease in elements
      JNZ LOOP        ; Loop until all elements are iterated.

HLT
```

Test Case:

Input : Location **2050H to 205FH** [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16]

Data | Stack | KeyPad | Memory | I/O Ports

Start 2050h OK

Address (Hex)	Address	Data
2050	8272	1
2051	8273	2
2052	8274	3
2053	8275	4
2054	8276	5
2055	8277	6
2056	8278	7
2057	8279	8
2058	8280	9
2059	8281	10
205A	8282	11
205B	8283	12
205C	8284	13
205D	8285	14

Line No	Assembler Message
0	Program assembled successfully

Data | Stack | KeyPad | Memory | I/O Ports

Start 2050h OK

Address (Hex)	Address	Data
2058	8280	9
2059	8281	10
205A	8282	11
205B	8283	12
205C	8284	13
205D	8285	14
205E	8286	15
205F	8287	16
2060	8288	0
2061	8289	0
2062	8290	0
2063	8291	0
2064	8292	0
2065	8293	0

Line No	Assembler Message
0	Program assembled successfully

Output :

Location **2055H to 2064H** [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16]

Data | Stack | KeyPad | Memory | I/O Ports

Start 2050h OK

Address (Hex)	Address	Data
2050	8272	0
2051	8273	0
2052	8274	0
2053	8275	0
2054	8276	0
2055	8277	1
2056	8278	2
2057	8279	3
2058	8280	4
2059	8281	5
205A	8282	6
205B	8283	7
205C	8284	8
205D	8285	9

Line No	Assembler Message
0	Program assembled successfully

Data | Stack | KeyPad | Memory | I/O Ports

Start 2050h OK

Address (Hex)	Address	Data
2058	8280	4
2059	8281	5
205A	8282	6
205B	8283	7
205C	8284	8
205D	8285	9
205E	8286	10
205F	8287	11
2060	8288	12
2061	8289	13
2062	8290	14
2063	8291	15
2064	8292	16
2065	8293	0

Line No	Assembler Message
0	Program assembled successfully

SUBMITTED BY:

BHAGYA VINOD RANA

[*U19CS012*]