MIT (Assignment – 4)

U20CS110
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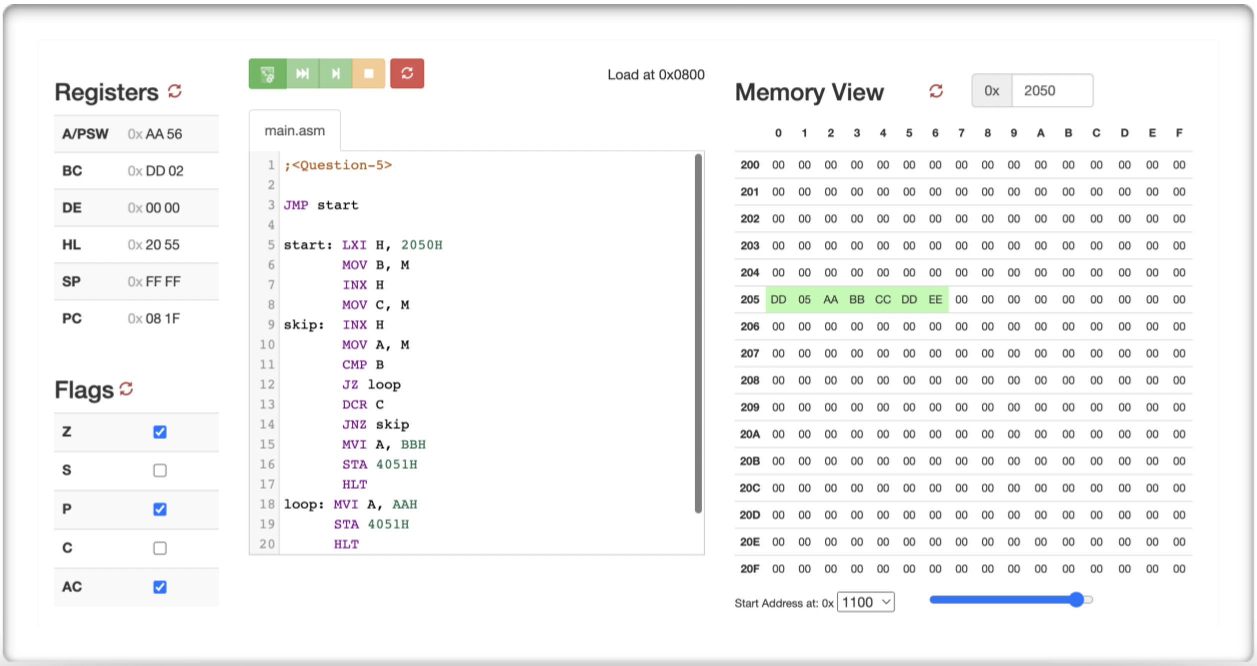
(1). Write an assembly language program in 8085 to search a given number in an array of n numbers. If number is found, then store AA in memory location 4051 otherwise store BB in 4051.

```
;<Question-1>
JMP start
 start: LXI H, 2050H
        MOV B, M
        INX H
        MOV C, M
skip:  INX H
        MOV A, M
        CMP B
        JZ loop
        DCR C
        JNZ skip
        MVI A, BBH
        STA 4051H
        HLT
loop: MVI A, AAH
       STA 4051H
       HLT
```



Registers

A/PSW	0x AA 56
BC	0x DD 02
DE	0x 00 00
HL	0x 20 55
SP	0x FF FF
PC	0x 08 1F

Flags

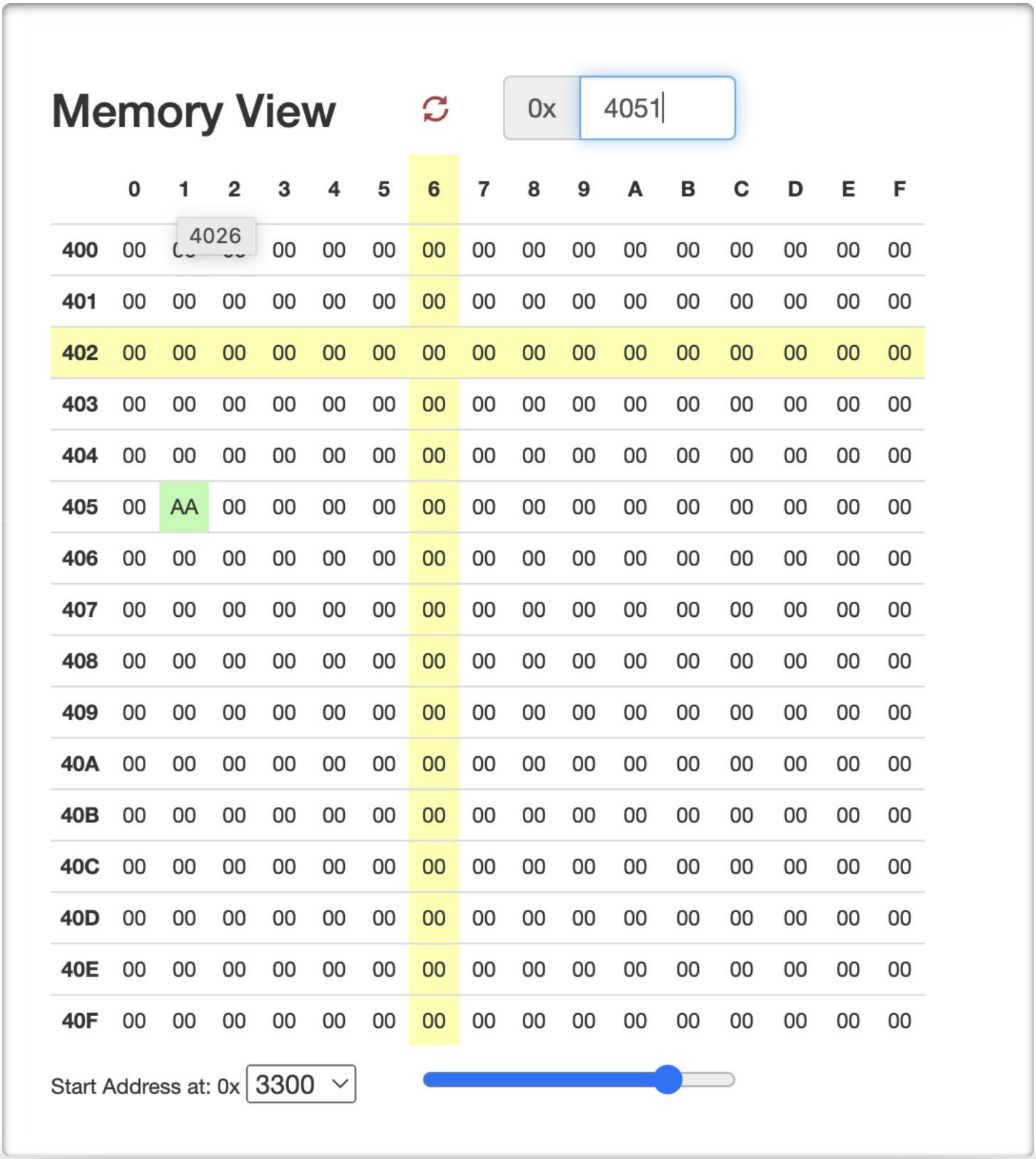
Z	☑
S	☐
P	☑
C	☐
AC	☑

```
;<Question-5>

JMP start

start: LXI H, 2050H
       MOV B, M
       INX H
       MOV C, M
skip:  INX H
       MOV A, M
       CMP B
       JZ loop
       DCR C
       JNZ skip
       MVI A, BBH
       STA 4051H
       HLT
loop: MVI A, AAH
      STA 4051H
      HLT
```

Memory View 0x 2050

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
200	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
201	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
202	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
203	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
204	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
205	DD	05	AA	BB	CC	DD	EE	00	00	00	00	00	00	00	00	00
206	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
207	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
208	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
209	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 1100

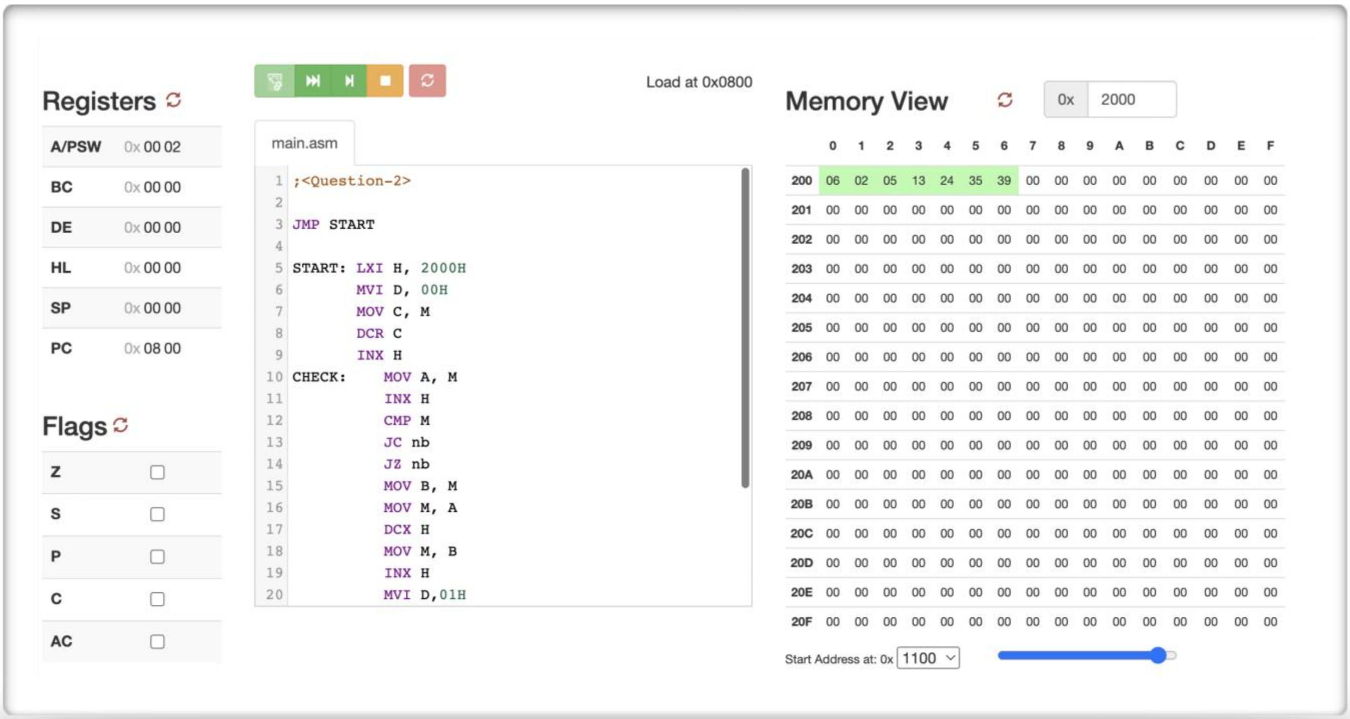


	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
400	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
401	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
402	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
403	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
404	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
405	00	AA	00	00	00	00	00	00	00	00	00	00	00	00	00	00
406	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
407	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
408	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
409	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 3300

(2).Write an assembly language program to sort numbers in ascending order where six numbers are stored in consecutive memory locations starting from 2000H.

```
;<Question-2>
JMP START
START: LXI H, 2000H
         MVI D, 00H
     MOV C, M
     DCR C
     INX H
CHECK: MOV A, M
           INX H
       CMP M
       JC NEXTBYTE
       JZ NEXTBYTE
       MOV B, M
       MOV M, A
       DCX H
       MOV M, B
       INX H
       MVI D,01H
NEXTBYTE: DCR C
               JNZ CHECK
               MOV A, D
               CPI 01H
               JZ START
               HLT
```



Registers

A/PSW	0x 00 02
BC	0x 00 00
DE	0x 00 00
HL	0x 00 00
SP	0x 00 00
PC	0x 08 00

Flags

Z	☐
S	☐
P	☐
C	☐
AC	☐

```
;<Question-2>

JMP START

START: LXI H, 2000H
        MVI D, 00H
        MOV C, M
        DCR C
        INX H
CHECK:     MOV A, M
           INX H
           CMP M
           JC nb
           JZ nb
           MOV B, M
           MOV M, A
           DCX H
           MOV M, B
           INX H
           MVI D,01H
```

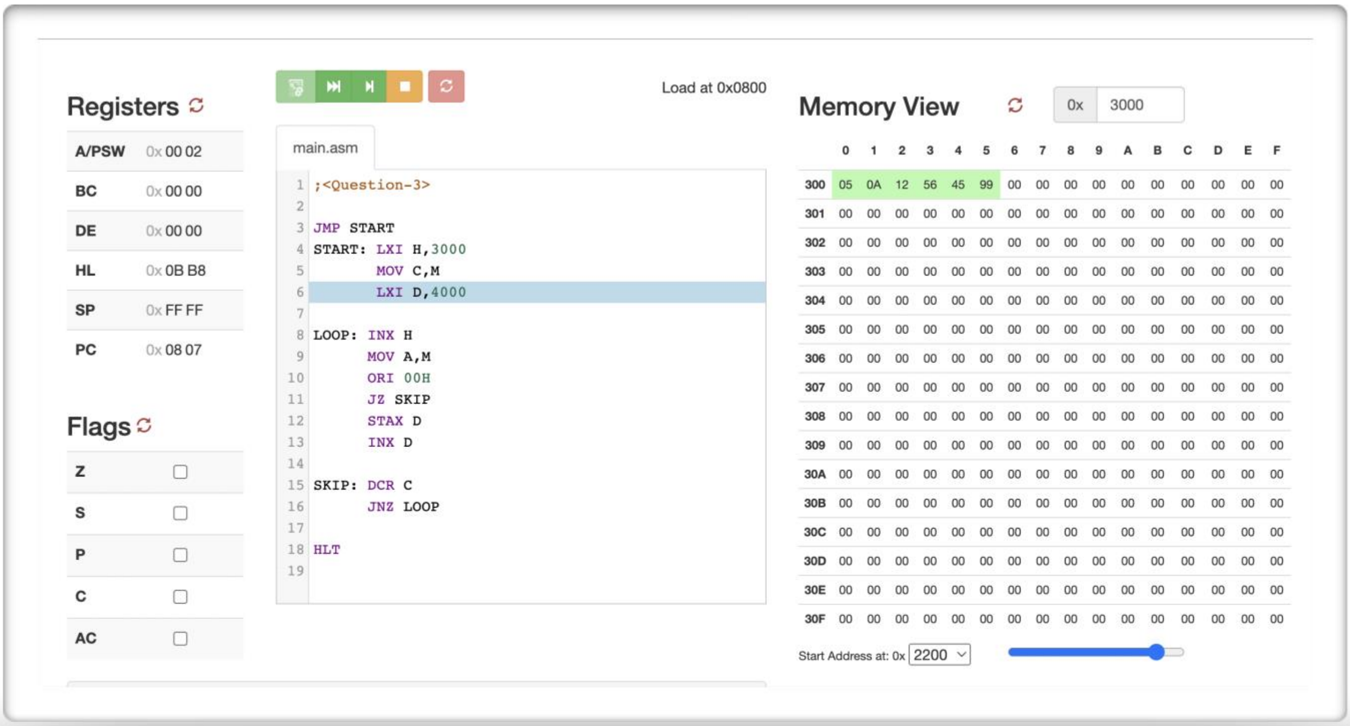
Memory View 0x 2000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
200	06	02	05	13	24	35	39	00	00	00	00	00	00	00	00	00
201	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
202	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
203	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
204	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
205	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
206	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
207	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
208	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
209	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 1100

(3).Write an assembly language program to take all numbers which are not 00H from array, and store them into different location. Numbers are stored at 3001 onwards, 3000 is holding the size of array, the results will be stored from 4000.

```
;<Question-3>
JMP START
START: LXI H,3000H
           MOV C,M
           LXI D,4000H

LOOP: INX H
          MOV A,M
     ORI 00H
          JZ SKIP
          STAX D
     INX D

SKIP: DCR C
          JNZ LOOP

HLT
```



Registers

A/PSW	0x 00 02
BC	0x 00 00
DE	0x 00 00
HL	0x 0B B8
SP	0x FF FF
PC	0x 08 07

Flags

Z	☐
S	☐
P	☐
C	☐
AC	☐

Load at 0x0800

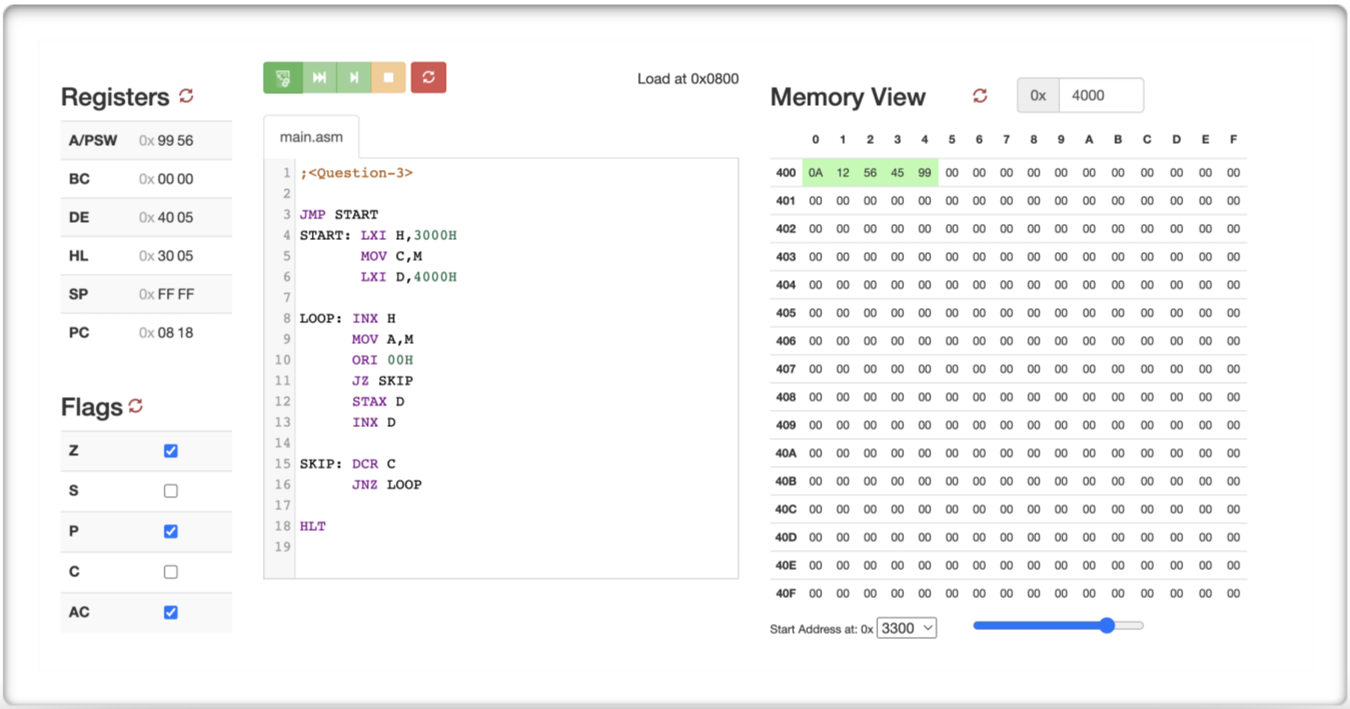
main.asm

```
;<Question-3>

JMP START
START: LXI H,3000
        MOV C,M
        LXI D,4000

LOOP: INX H
       MOV A,M
       ORI 00H
       JZ SKIP
       STAX D
       INX D

SKIP: DCR C
       JNZ LOOP

HLT
```

Memory View 0x 3000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
300	05	0A	12	56	45	99	00	00	00	00	00	00	00	00	00	00
301	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
302	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
303	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
304	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
305	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
306	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
307	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
308	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
309	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 2200



Registers

A/PSW	0x 99 56
BC	0x 00 00
DE	0x 40 05
HL	0x 30 05
SP	0x FF FF
PC	0x 08 18

Flags

Z	☑
S	□
P	☑
C	□
AC	☑

Load at 0x0800

main.asm

```
;<Question-3>

JMP START
START: LXI H,3000H
       MOV C,M
       LXI D,4000H

LOOP: INX H
      MOV A,M
      ORI 00H
      JZ SKIP
      STAX D
      INX D

SKIP: DCR C
      JNZ LOOP

HLT

```

Memory View

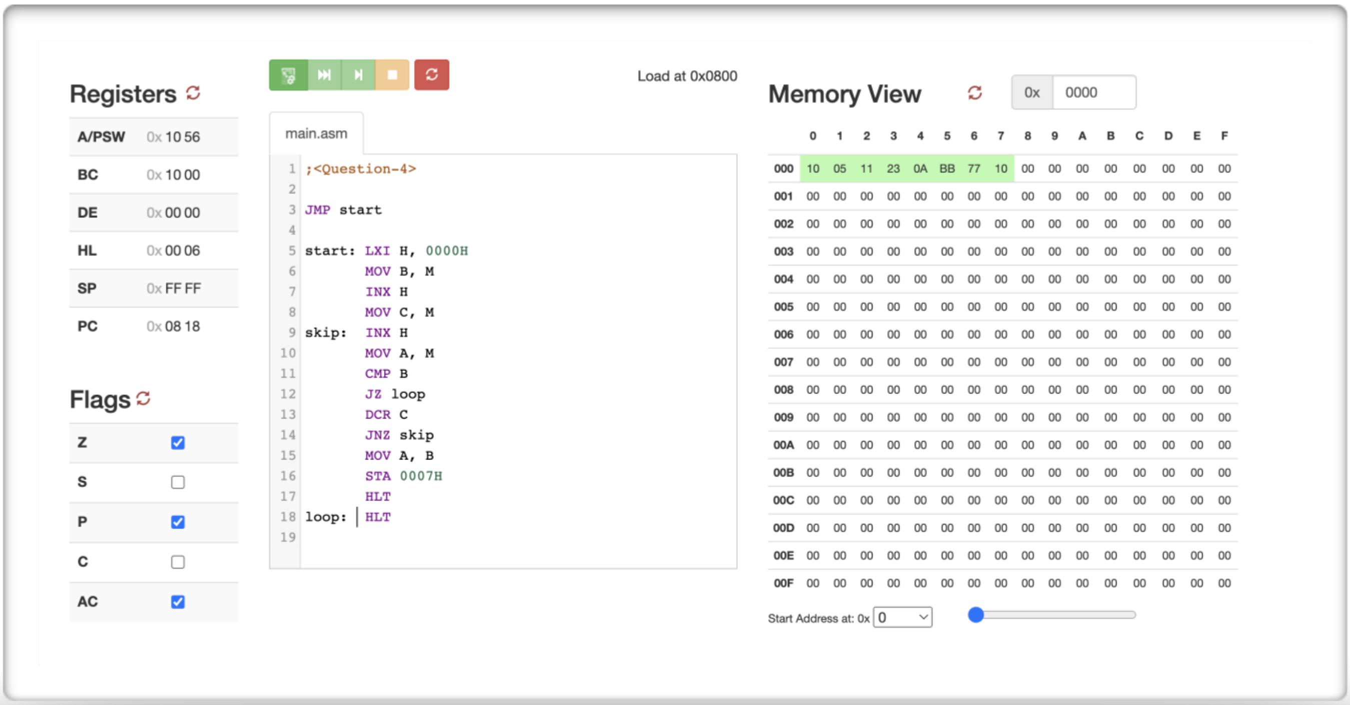
0x 4000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
400	0A	12	56	45	99	00	00	00	00	00	00	00	00	00	00	00
401	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
402	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
403	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
404	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
405	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
406	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
407	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
408	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
409	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
40F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 3300

(4).Write an assembly language program to insert a new value in an array of data only if it is not present in the array. Assume suitable data and memory location.

```
;<Question-4>
JMP start

start: LXI H, 0000H
          MOV B, M
     INX H
     MOV C, M
skip:  INX H
          MOV A, M
     CMP B
     JZ loop
     DCR C
     JNZ skip
     MOV A, B
     STA 0007H
     HLT
loop:  HLT
```



Registers

A/PSW	0x 10 56
BC	0x 10 00
DE	0x 00 00
HL	0x 00 06
SP	0x FF FF
PC	0x 08 18

Flags

Z	☑
S	□
P	☑
C	□
AC	☑

```
;<Question-4>

JMP start

start: LXI H, 0000H
       MOV B, M
       INX H
       MOV C, M
skip:  INX H
       MOV A, M
       CMP B
       JZ loop
       DCR C
       JNZ skip
       MOV A, B
       STA 0007H
       HLT
loop:  HLT
```

Memory View 0x 0000

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
000	10	05	11	23	0A	BB	77	10	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
003	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
004	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
005	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
006	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
007	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
008	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
009	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00A	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00B	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00D	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00F	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Start Address at: 0x 0