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REG NO: 690

Microprocessor and Microcontroller (ECC 512)

Lab Assignment 1

PROB.1 FIND OUT THE 2'S COMPLEMENT OF THE NUMBER STORED IN MEMORY LOCATION

8C00H AND PLACE THE RESULT IN MEMORY LOCATION 8C01H.

The screenshot shows a microcontroller simulation interface. On the left, the assembly code is displayed:

```
Assembler: Atmel Studio 7.0.0.10000
File   Debugger   Help
[File] [Open] [Save] [Exit]
[Run] [Stop] [Break]
[Step Into] [Step Out] [Step Over]
[Reset]
[Watch] [Registers] [Memory] [I/O Ports]
[Conversion] [Hex]
[Port Value]
[Memory]

Flag: S: 1 Z: 0 AC: 0 P: 0 C: 0 FF: 0
Conversion: Hex
Port Value:
Memory:

Load me at: [ ] ;<Program title>
1
2
3
4 jmp start
5
6 ;data
7
8
9 ;code
10 start: nop
11 LDA 8C00H
12 CMA
13 INR A
14 STA 8C01H
15
16 hlt
```

On the right, the memory dump shows the following data:

Address (Hex)	Address	Data
8C00	35840	5
8C01	35841	251
8C02	35842	0
8C03	35843	0
8C04	35844	0
8C05	35845	0
8C06	35846	0
8C07	35847	0
8C08	35848	0
8C09	35849	0
8C0A	35850	0
8C0B	35851	0
8C0C	35852	0
8C0D	35853	0
8C0E	35854	0
8C0F	35855	0
8C10	35856	0
8C11	35857	0
8C12	35858	0
8C13	35859	0

Message: Line No: Assembler Message
0 Program assembled successfully.

PROB.2 TWO 8 BIT NUMBERS ARE STORED IN MEMORY LOCATIONS 8C00H AND 8C01H.

PERFORM ADDITION AND STORE THE RESULT IN 8C02H.

The screenshot shows a software interface for a microcontroller. On the left is the assembly code editor with the following content:

```
1  ;<Program title>
2
3
4  jmp start
5
6  ;data
7
8
9  ;code
10 start: nop
11
12 LXI H,8C00H
13 MOV A,M
14 INX H
15 ADD M
16 INX H
17 MOV M,A
18
19 hlt
```

On the right is the memory dump window titled "Memory" with "Start" set to "8C00H". It displays the following memory map:

Address (Hex)	Address	Data
8C00	35840	15
8C01	35841	2
8C02	35842	17
8C03	35843	0
8C04	35844	0
8C05	35845	0
8C06	35846	0
8C07	35847	0
8C08	35848	0
8C09	35849	0
8C0A	35850	0
8C0B	35851	0
8C0C	35852	0
8C0D	35853	0
8C0E	35854	0
8C0F	35855	0
8C10	35856	0
8C11	35857	0
8C12	35858	0
8C13	35859	0

At the bottom of the memory dump window, there is a message: "Line No Assembler Message" followed by "0 Program assembled successfully".

PROB.3 TWO 8 BIT NUMBERS ARE STORED IN MEMORY LOCATIONS 8C00H AND 8C01H.

PERFORM SUBTRACTION AND STORE THE RESULT IN 8C02H.

The screenshot shows a software interface for a microcontroller. On the left is the assembly code editor with the following content:

```
1  ;<Program title>
2
3
4  jmp start
5
6  ;data
7
8
9  ;code
10 start: nop
11 LXI H,8C00H
12 MOV A,M
13 INX H
14 SUB M
15 INX H
16 MOV M,A
17
18 hlt
```

On the right is the memory dump window titled "Memory" with "Start" set to "8C00H". It displays the following memory map:

Address (Hex)	Address	Data
8C00	35840	23
8C01	35841	2
8C02	35842	21
8C03	35843	0
8C04	35844	0
8C05	35845	0
8C06	35846	0
8C07	35847	0
8C08	35848	0
8C09	35849	0
8C0A	35850	0
8C0B	35851	0
8C0C	35852	0
8C0D	35853	0
8C0E	35854	0
8C0F	35855	0
8C10	35856	0
8C11	35857	0
8C12	35858	0
8C13	35859	0

At the bottom of the memory dump window, there is a message: "Line No Assembler Message" followed by "0 Program assembled successfully".

**PROB.4 ONE 16 BIT NUMBER IS IN 8C00H AND 8C01H. ANOTHER NUMBER IS IN
MEMORY LOCATIONS 8C02H AND 8C03H. ADD THE NUMBERS AND STORE THE
RESULT IN 8C04H AND 8C05H.**

The screenshot shows a Z80 assembly debugger interface. On the left, the assembly code is listed:

```
Load me at: [empty]
1  ;<Program title>
2  jmp start
3
4  ;data
5
6
7
8
9  ;code
10 start: nop
11 LXI H,8C01H
12 MOV A,M
13 INX H
14 INX H
15 ADD M
16 INX H
17 INX H
18 MOV M,A
19 LXI H,8C00H
20 MOV A,M
21 INX H
22 INX H
23 ADD M
24 INX H
25 INX H
26 MOV M,A
27
28 hlt
```

On the right, the memory dump window displays the following data:

Address (Hex)	Address	Data
8C00	35840	3
8C01	35841	32
8C02	35842	4
8C03	35843	53
8C04	35844	7
8C05	35845	85
8C06	35846	0
8C07	35847	0
8C08	35848	0
8C09	35849	0
8C0A	35850	0
8C0B	35851	0
8C0C	35852	0
8C0D	35853	0
8C0E	35854	0
8C0F	35855	0
8C10	35856	0
8C11	35857	0
8C12	35858	0
8C13	35859	0