

## **8086 Microprocessor Lab**

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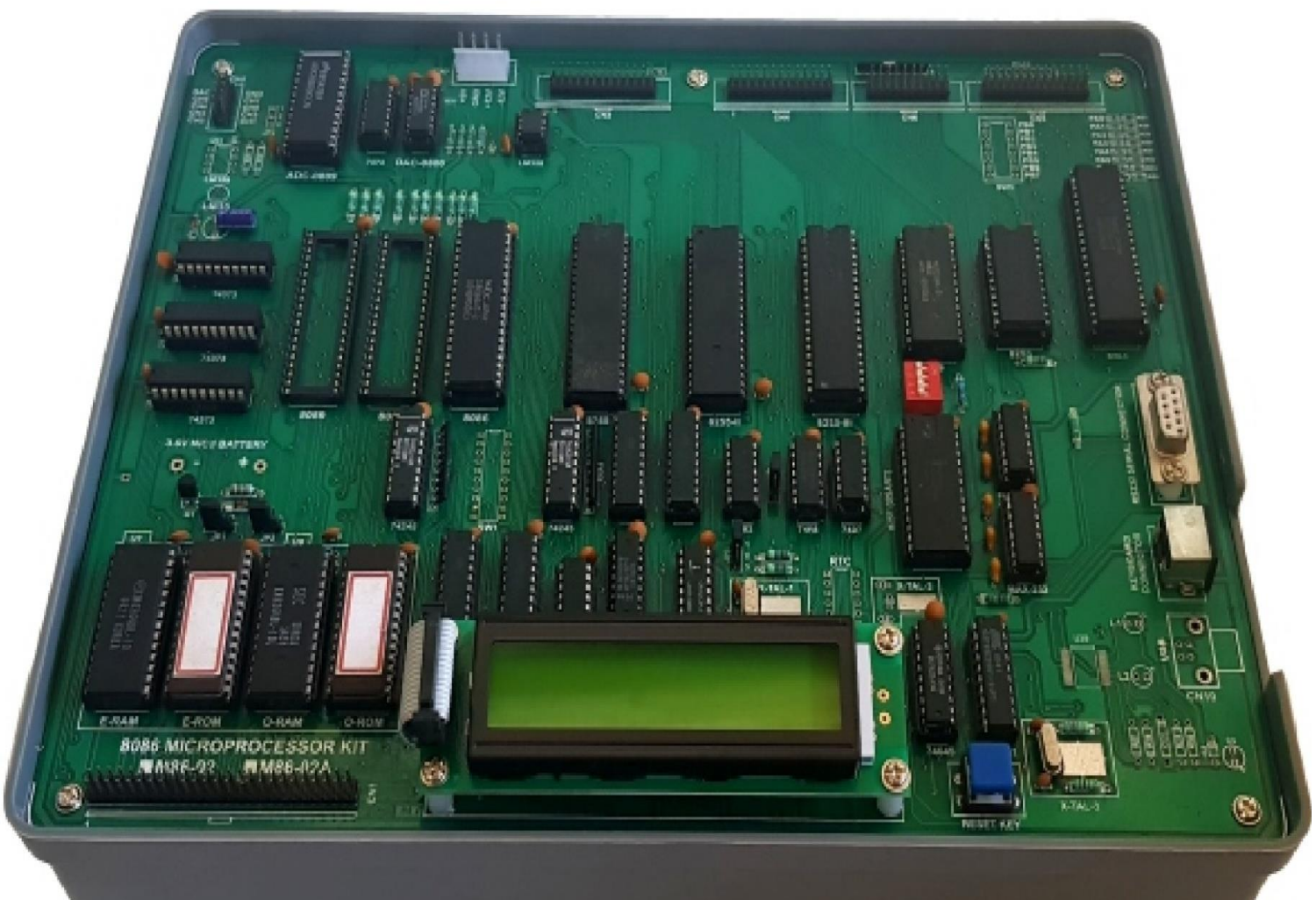
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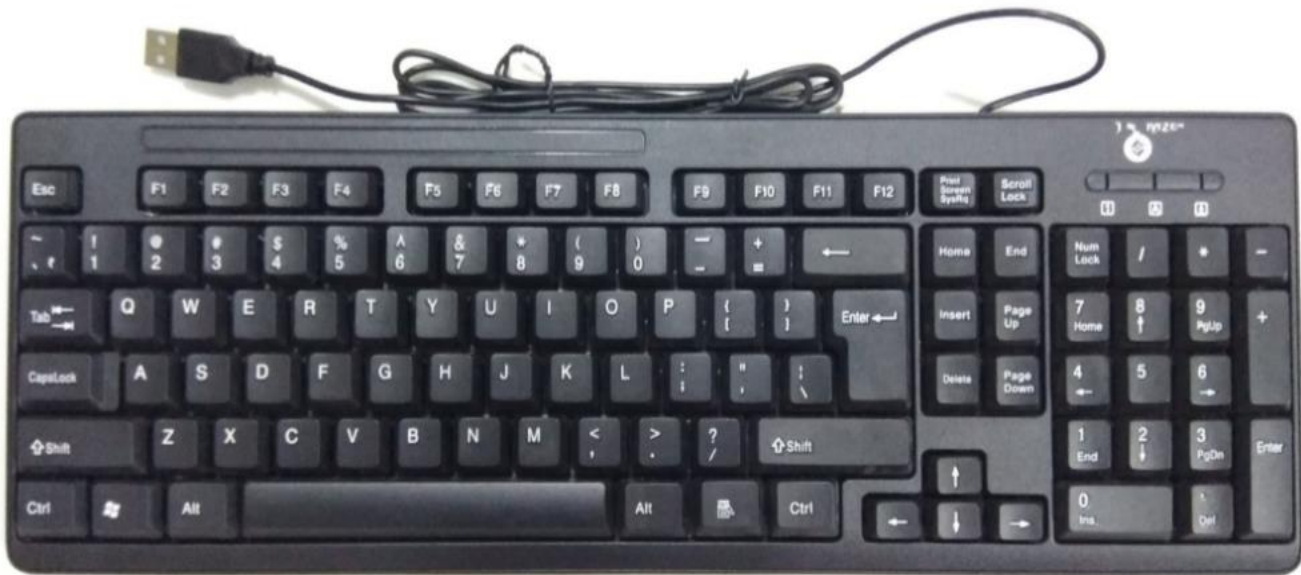
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## Experiment No. 01

**Objective-:** Write 8086 assembly language program to add two 16 bit numbers where starting address is 0400H and the numbers are at 0500H and 0502H memory address and store result into 0504H and 0506H memory address.

**Apparatus Required-:** 8086 microprocessor trainer kit, Keyboard.





## Program:-

Memory Address	Mnemonics	Operands	Comment
0400	MOV	CX,0000	Initialise count register with 0000H
0403	MOV	AX,[0500]	Load the first number into AX
0407	MOV	BX,[0502]	Load second number into BX
040B	ADD	AX,BX	Add AX and BX, and store to AX
040D	JNC	0410	If CY=0, jump to 0410H
040F	INC	CX	Increase the count register by 1
0410	MOV	[0504],AX	Store the AX content into memory
0414	MOV	[0506],CX	Store CX value into next memory location
0418	HLT		Terminate the program

## Procedure-:

1. **To Enter the Mnemonics and Operands:**
  - i. Connect the keyboard in keyboard connector.
  - ii. Switch ON the trainer kit.
  - iii. Press **RESET** button. Then display shows;

**[ M86 – 02 L ]**  
**ENTER RETURN KEY...**

- iv. Press **ENTER** key. Then display shows;

**[ M86 – 02 L ]    7FFF**  
**> A. D. F. G. I. M. P. T. U.**

- v. Press **"A"** for enter the starting address of the program. Then display shows;

**[ M86 – 02 L ]    7FFF**  
**A    \_**

- vi. Type the starting address like as;



```
[ M86 - 02 L ] 7FFF  
A 0000:0400_
```

Then after pressing the **ENTER** key the display shows;

```
0400 _
```

vii. Type the mnemonics **MOV CX,0000** like as;

```
0400 MOV CX,0000_
```

Then after pressing the **ENTER** key the display shows;

```
0403 _
```

viii. Again type the mnemonics **MOV AX,[0500]** press **ENTER** key, type the mnemonics **MOV BX,[0502]** press **ENTER** key and continue the same procedure till the end of the program.

**0403 MOV AX,[0500]\_**

**0407 MOV BX,[0502]\_**

**040B ADD AX,BX\_**

**040D JNC 0410\_**

**040F INC CX\_**

**0410 MOV [0504],AX\_**

**0414 MOV [0506],CX\_**

**0418 HLT\_**

**0419 \_**

## 2. To Enter the Input Data:

- i. Press **"F7"**. Then display shows;

**0419**  
**> A. D. F. G. I. M. P. T. U.**

- ii. Press **"D"**. Then display shows;

**0419**  
**D \_**

- iii. Type the address where the input data is to be store.

**0419**  
**D 0000:0500\_**



Then after pressing the **ENTER** key and enter the input data, the display shows;

```
0000:0500 02 F0 02
      F0 00 00 00 00
```

### 3. Execution Procedure:

- i. Press "**F7**". Then display shows;

```
0000:0500 02 F0 02
> A.D. F. G. I.M.P.T.U.
```

- ii. Press "**G**" and then press **ENTER** key, display shows;

```
0000:0500 02 F0 02
G 0000:0400_
```

4. **To see Output:**

- i. Press **RESET** button. Then display shows;

**[ M86 – 02 L ]  
ENTER RETURN KEY...**

- ii. Press **ENTER** key. Then display shows;

**[ M86 – 02 L ] .. 7FFF  
> A. D. F. G. I. M. P. T. U.**

- iii. Press **“D”**. Then display shows;

**[ M86 – 02 L ] .. 7FFF  
D \_**

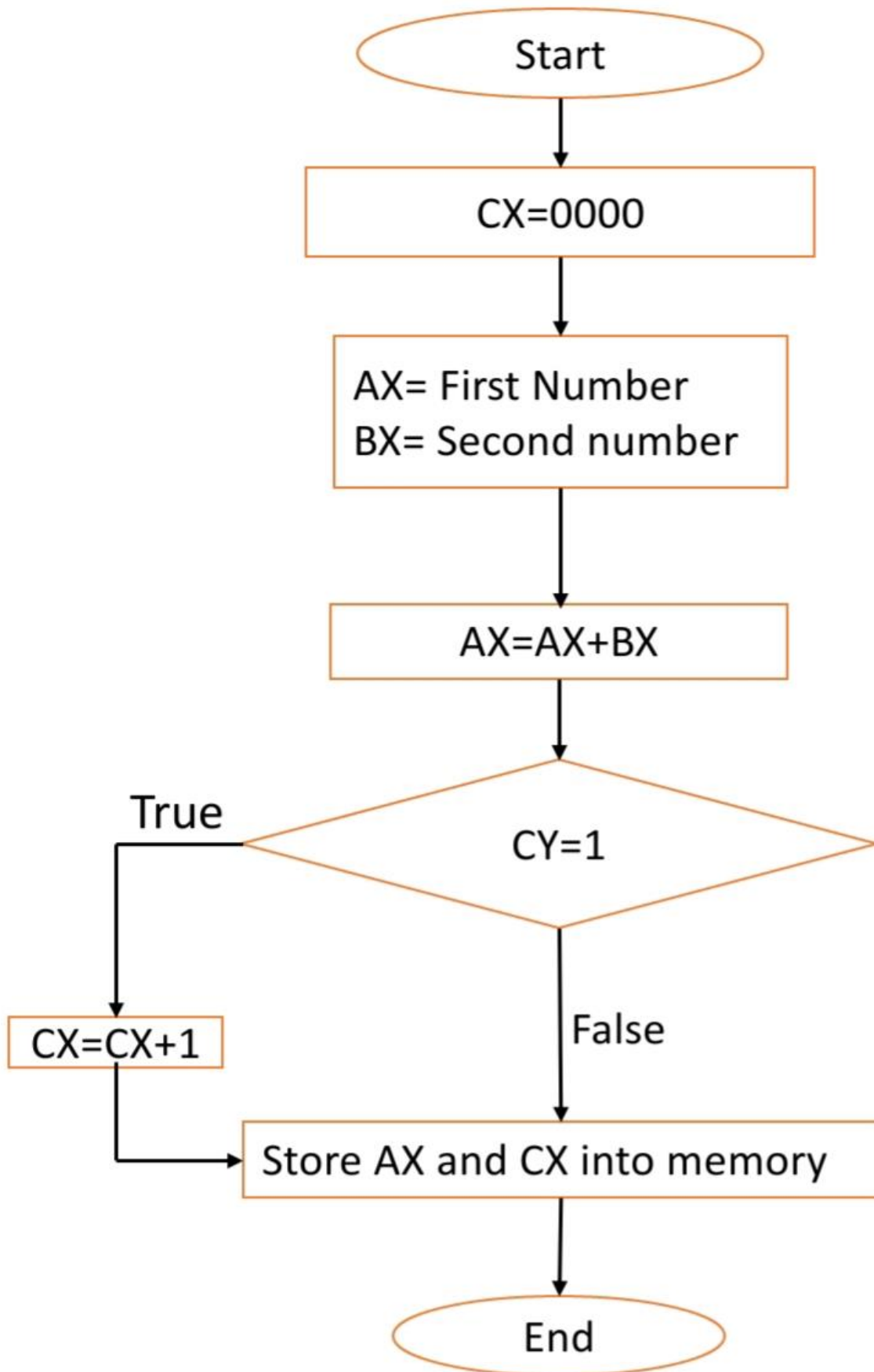
- iv. Type the address of result. Then display shows;

**[ M86 – 02 L ] .. 7FFF**  
**D 0000:0504\_**

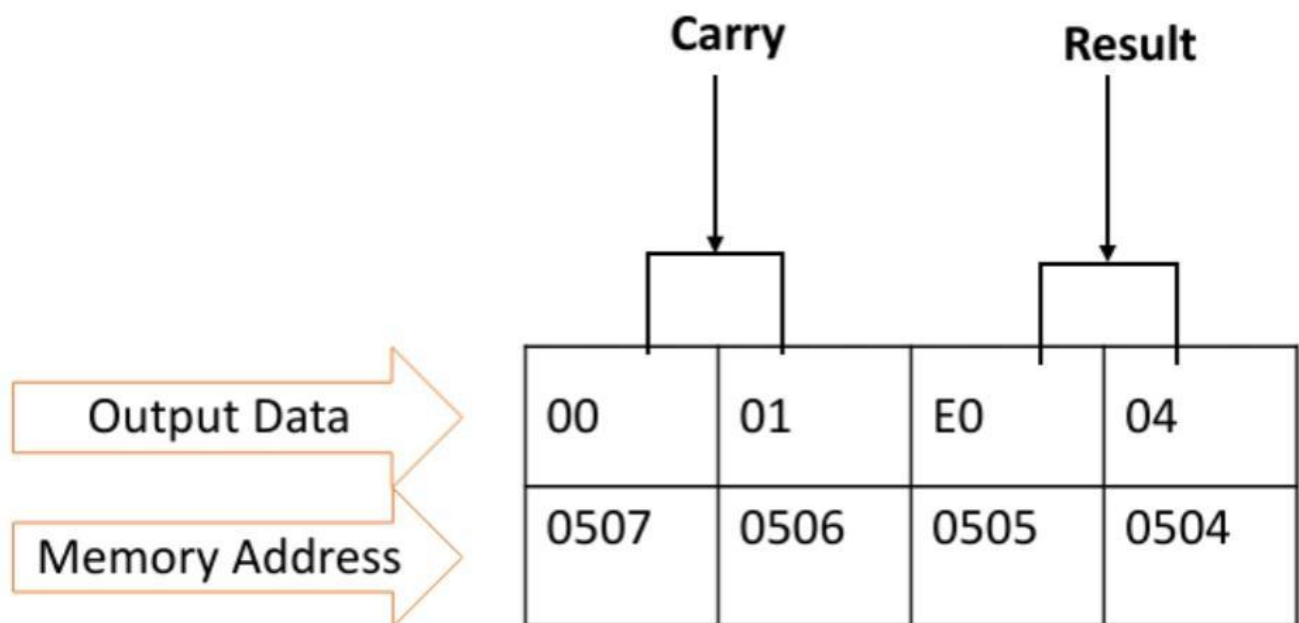
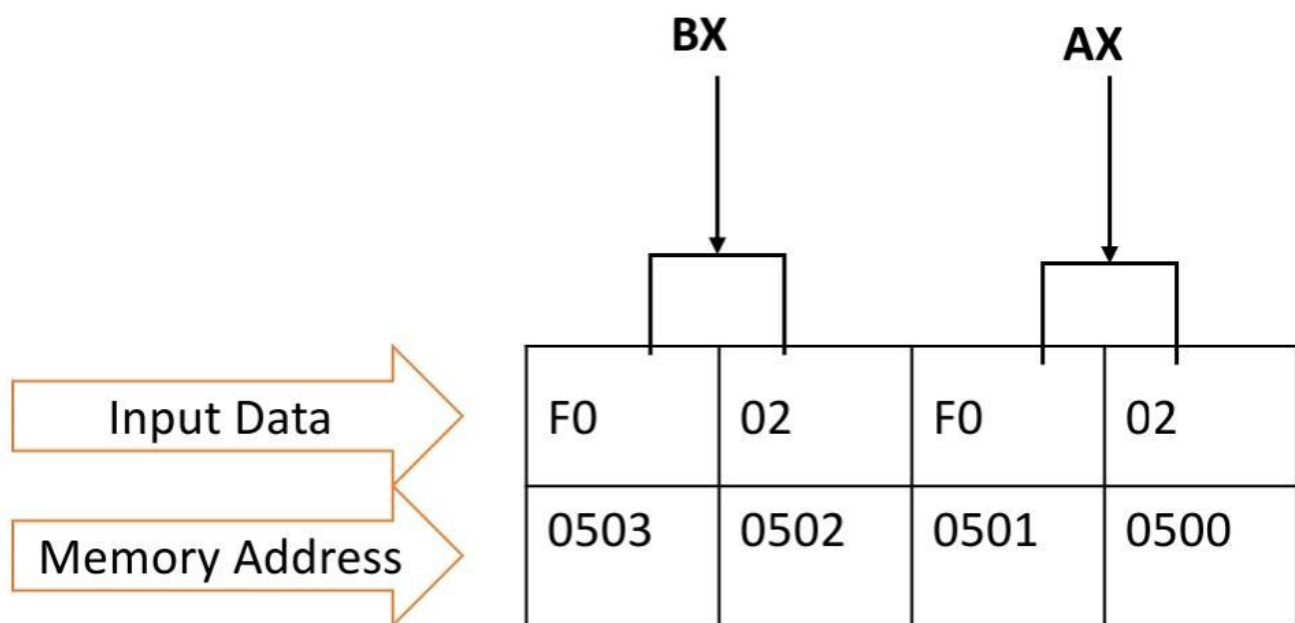
- v. After pressing **ENTER** key, display shows the result;

**0000:0504 04 E0 01**  
**00 00 00 00 00**

## Flow Chart:-



## Result-:





## **Experiment No. 02**

**Objective-**: Write 8086 assembly language program to Subtract two 16-bit number where starting address is 0400H and the numbers are at 0500H and 0502H memory address and store result into 0504H and 0506H memory address.

**Apparatus Required-**: 8086 trainer kit, Keyboard.

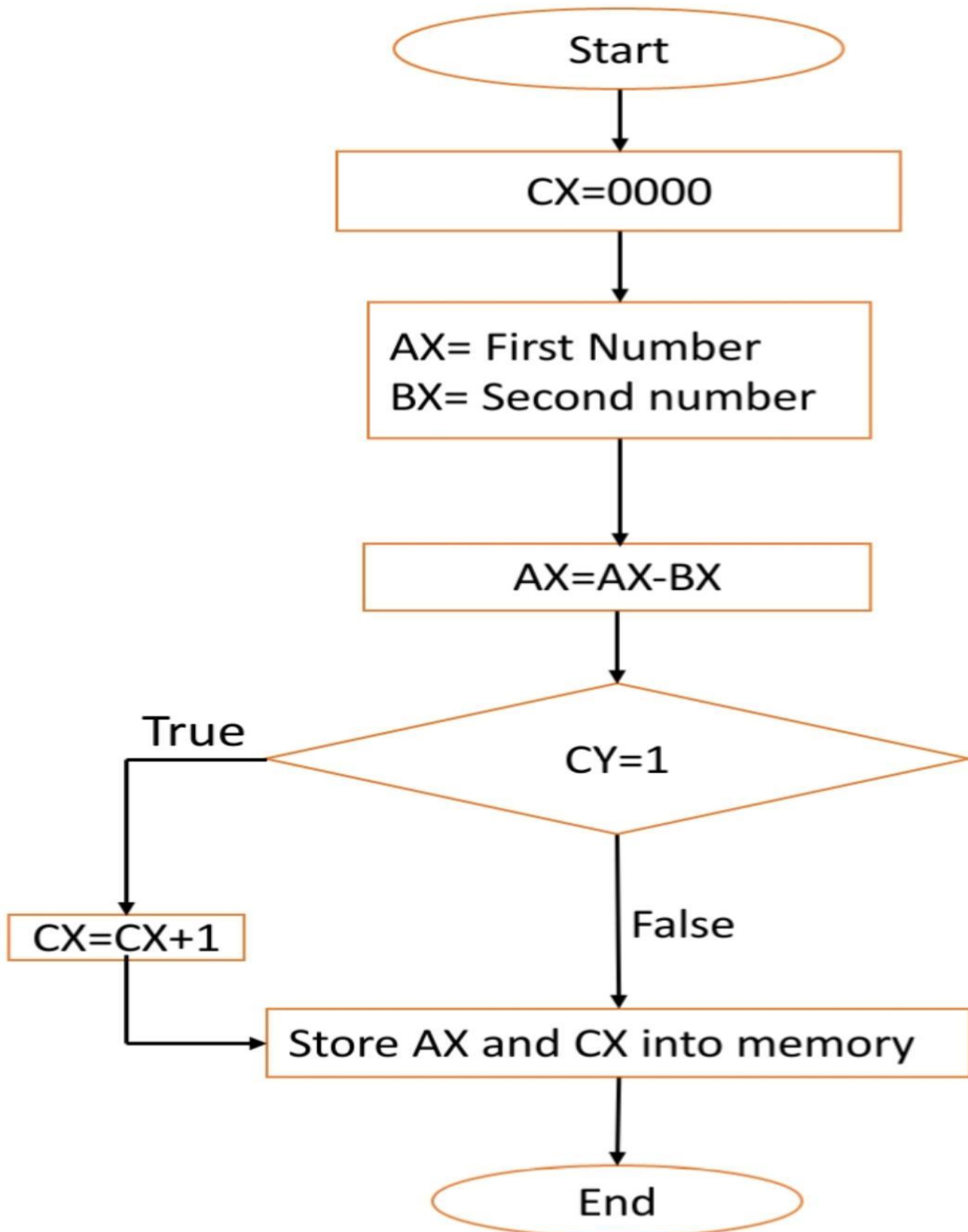
## Program-:

Memory Address	Mnemonics	Operands	Comment
0400	MOV	CX,0000	Initialise count register with 0000H
0403	MOV	AX,[0500]	Load the first number into AX
0407	MOV	BX,[0502]	Load second number into BX
040B	SUB	AX,BX	Subtract BX from AX and store to AX
040D	JNC	0410	If CY=0, jump to 0410H
040F	INC	CX	Increase the count register by 1
0410	MOV	[0504],AX	Store the AX content into memory
0414	MOV	[0506],CX	Store CX value into next memory location
0418	HLT		Terminate the program

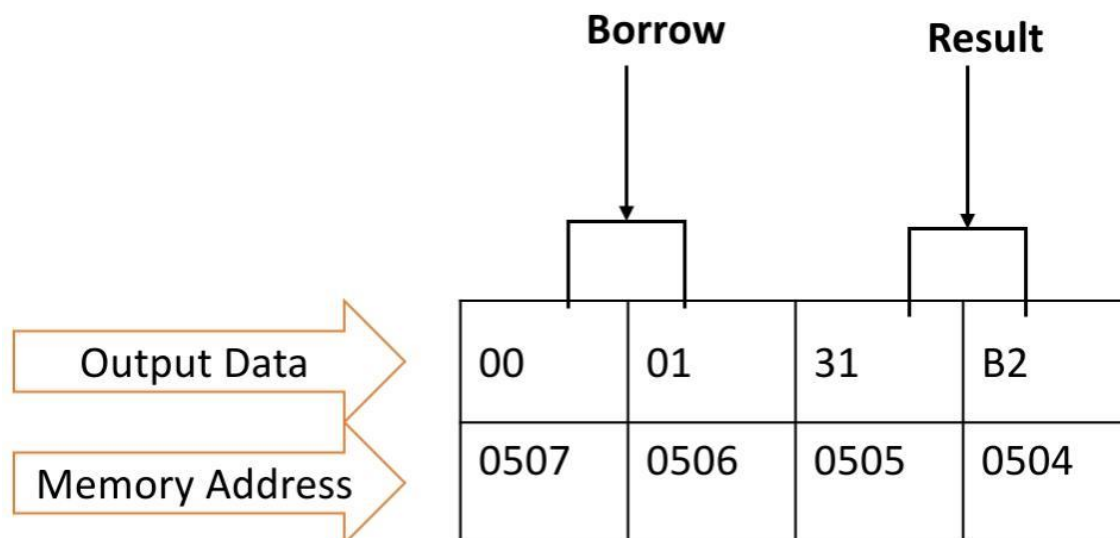
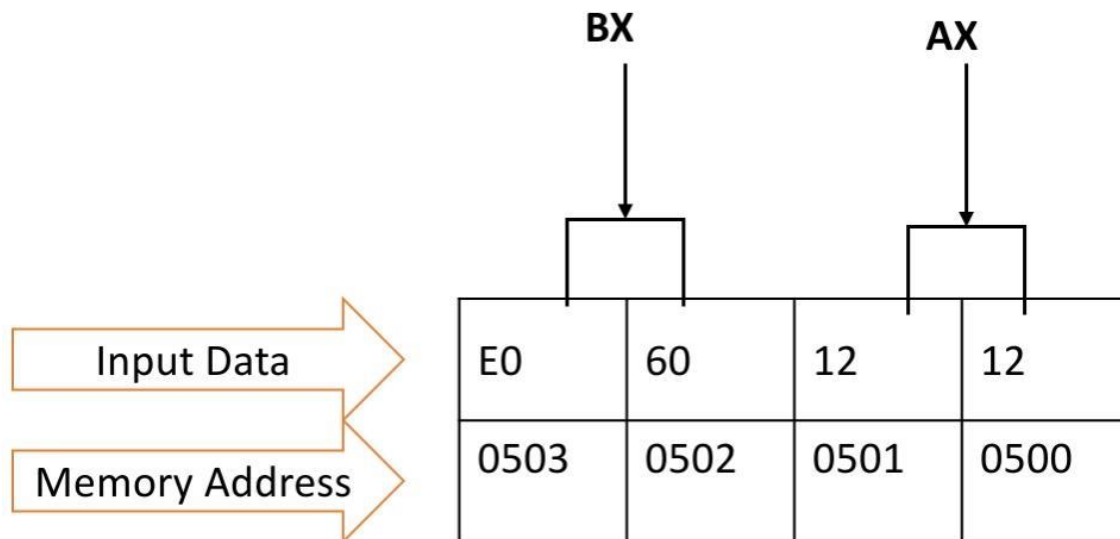
## Procedure-:

- All steps are the same as experiment no. 01.

## Flow Chart -:



## Result-:



## **Experiment No. 03**

**Objective-:** Write 8086 assembly language program to multiply two 8-bit numbers, where numbers are stored from offset 0500 and store the result into offset 0600.

**Apparatus Required-:** 8086 trainer kit, Keyboard.

**Program-:**

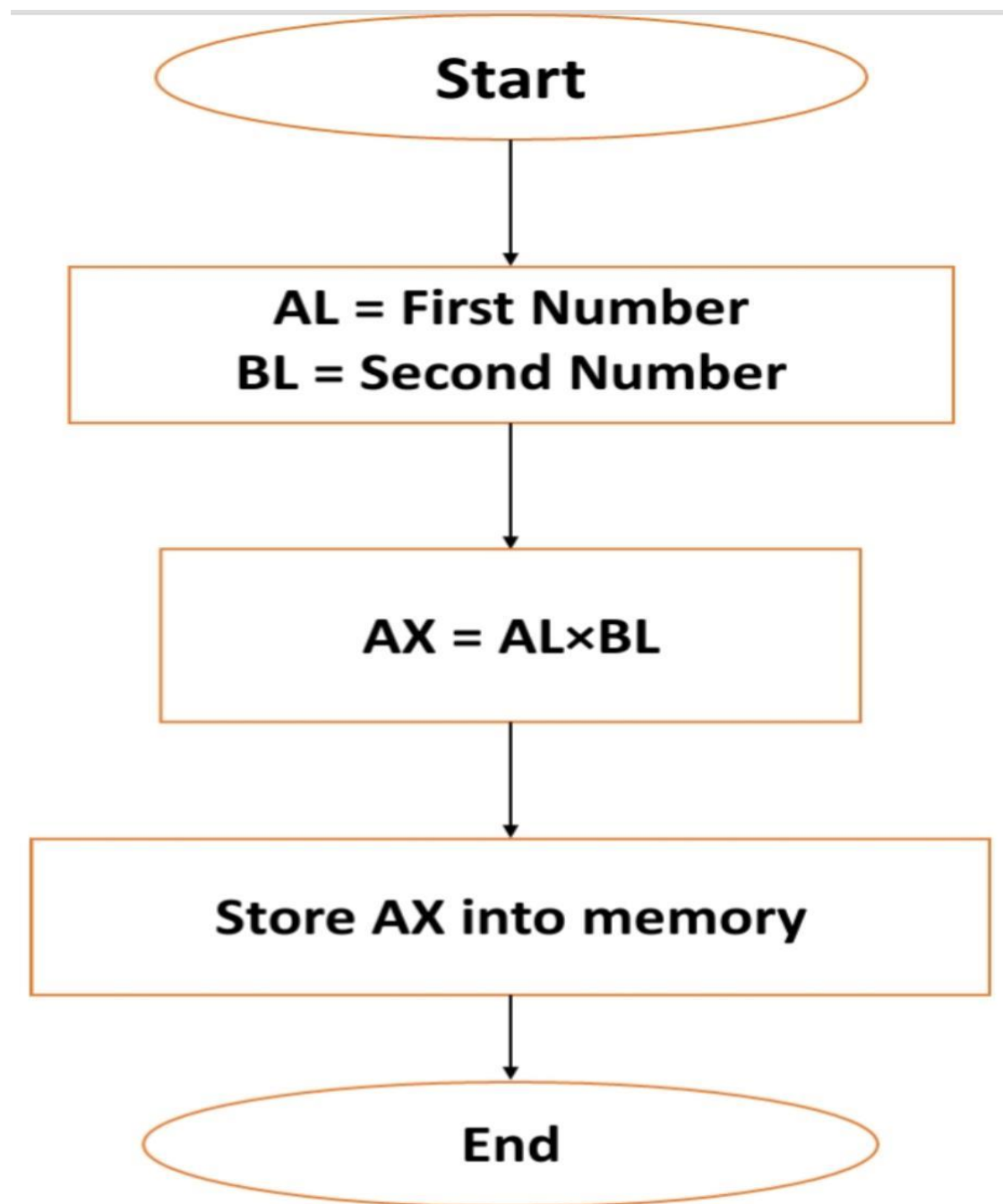
Memory Address	Mnemonics	Operands	Comment
0400	MOV	SI,500	Load 500 into the source index register
0403	MOV	DI,600	Load 600 into the destination index register
0406	MOV	AL,[SI]	Take the first number from memory
0408	INC	SI	Source index point to next address
0409	MOV	BL,[SI]	Take the second number from memory
040B	MUL	BL	Multiply AL and BL
040D	MOV	[DI],AX	Store the 16-bit result into memory
040F	HLT		Terminate the program



## Procedure-:

- All steps are the same as experiment no. 1.

## Flow Chart-:



## Result-:

Input Data	04	05
Address (offset)	501	500

Output Data	00	14
Address (offset)	601	600

## **Experiment No. 04**

**Objective-:** Write 8086 assembly language program to divide 16-bit number by 8-bit number.

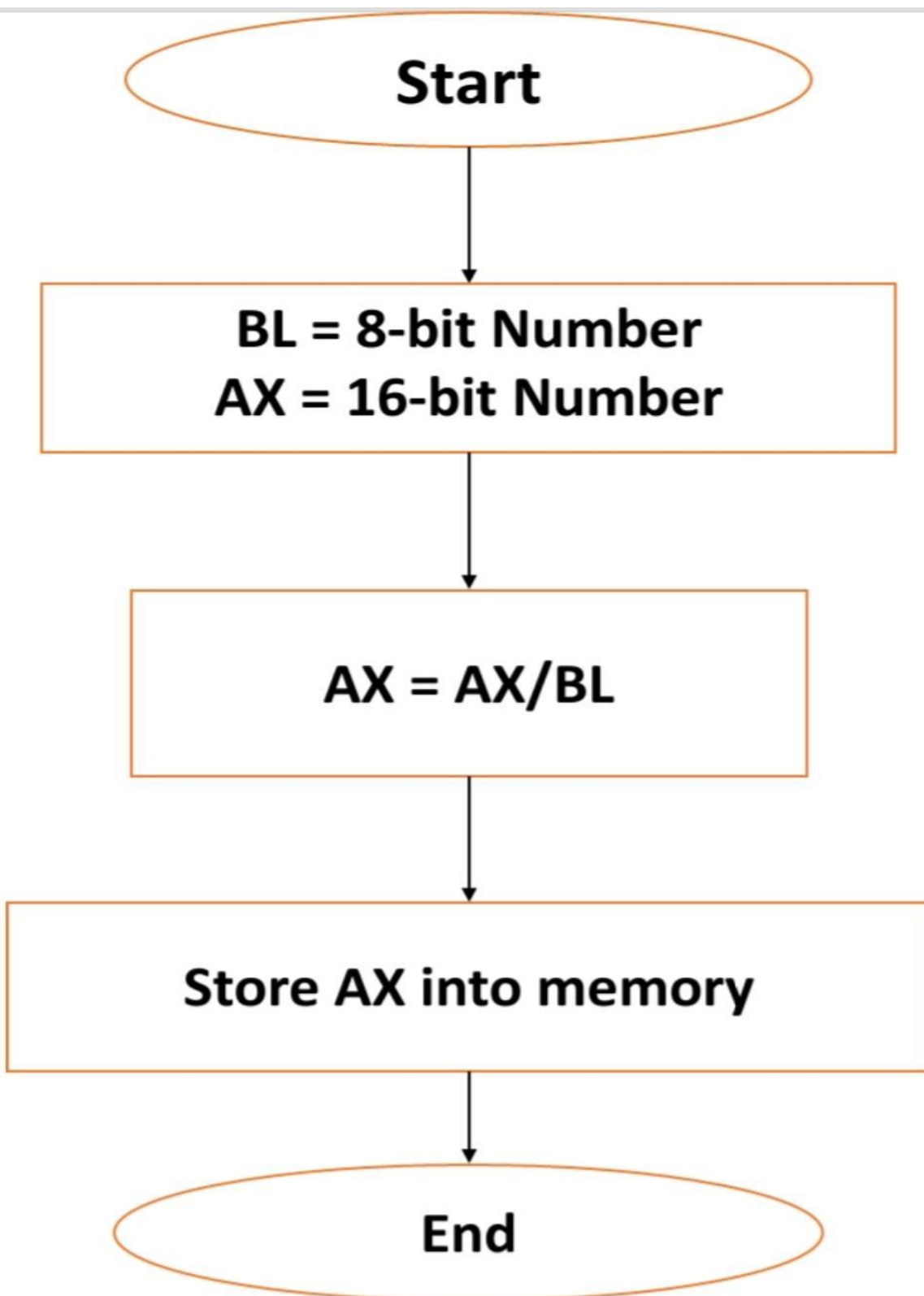
**Apparatus required-:** 8086 trainer kit, keyboard.

**Program-:**

Memory Address	Mnemonics	Operands	Comment
0400	MOV	SI,500	Load 500 into the source index register
0403	MOV	DI,600	Load 600 into the destination index register
0406	MOV	BL,[SI]	Take the 8-bit number from memory to BL
0408	INC	SI	Source index point to next address
0409	MOV	AX,[SI]	Take the 16-bit number from memory to AX
040B	DIV	BL	Divide AL by BL
040D	MOV	[DI],AX	Store the 16-bit result into memory
040F	HLT		Terminate the program

## Flow Chart-:

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## Result-:

