

**BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY**



**Department of Electrical and Electronic Engineering**

**Course No. : EEE 416**

**Course Title:** Microprocessor and Interfacing Laboratory

**Arithmetic of Signed Integers, Double Precision, BCD and  
Floating Point Numbers in 8086**

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**Level:** 4

**Term:** 1

**Section:** A

**Submission Deadline:** 03 - 06 -2021

## **Problem 1**

Adding two 16 bit numbers and multiplying the result with another 16 bit number

### **Assembly Code:**

```
CODE    SEGMENT

    ASSUME CS:CODE, DS:CODE

    . ***** MAIN ***** .
    ;

    MOV AX, A

    ADD AX, B
    MOV S, AX
    ADC S+2, 0 ; S+2:S = A+B

    MOV CX, C
    MUL CX
    MOV P, AX
    MOV P+2, DX
    MOV AX, S+2
    MUL CX
    ADD AX, P+2
    MOV P+2, AX
    ADC P+4, 0

    HLT

    . ***** DATA ***** .
    ;

    A DW 0F042H
    B DW 0ECFFH
    C DW 321BH
    S DW ?, ?
    P DW ?, ?, ?

CODE    ENDS
    END
```

Result:

size:	word	elements:	3
edit		show as:	hex
A	0F042h		
B	0ECFFh		
C	321Bh		
S	0DD41h, 0001h		
P	07DBh, 5D69h, 0000h		

Fig: Output matching the example in problem statement

## Hex Calculator

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

Result

Hex value:

FFFE + ECCC = 1ECCA

## Hex Calculator

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

Result

Hex value:

1ECCA × ABCD = 14AB58BC2

size:	word	elements:	3
edit		show as:	hex
A	0FFFEh		
B	0ECCCh		
C	0ABCDh		
S	0ECCAh, 0001h		
P	8BC2h, 4AB5h, 0001h		

Fig: Second demonstration using different values and comparing to online calculator

## **Problem 2**

Adding two 16 bit numbers and multiplying the result with another 16 bit number

### **Assembly Code:**

CODE SEGMENT

ASSUME CS:CODE, DS:CODE

; \*\*\*\*\* MAIN \*\*\*\*\* ;

; C+4:C+2:C = A+2:A x B

MOV BX, B

MOV AX, A

MUL BX

MOV C, AX

MOV C+2, DX

MOV AX, A+2

MUL BX

ADD AX, C+2

ADC DX, 0

MOV C+2, AX

MOV C+4, DX

; C+6:C+4:C+2 = A+2:A x B+2 + C+4:C+2

MOV BX, B+2

MOV AX, A

MUL BX

ADD AX, C+2

ADC DX, C+4

ADC CX, 0

MOV C+2, AX

MOV C+4, DX

MOV C+6, CX

MOV AX, A+2

MUL BX

ADD AX, C+4

ADC DX, C+6

MOV C+4, AX

MOV C+6, DX

HLT

```
. ***** DATA ***** ;
```

```
A DW 0BA98H, 0FEDCH
```

```
B DW 03210H, 07654H
```

```
C DW ?, ?, ?, ?
```

```
CODE ENDS
```

```
END
```

**Result:**

## Hex Calculator

### Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

#### Result

Hex value:

FEDCBA98 × 76543210 = **75CD9046541D5980**

Fig: Multiplication result from online calculator

size:	<b>word</b>	elements:	<b>4</b>
<input type="button" value="edit"/>		show as:	<b>hex</b>
<b>A</b>	<b>0BA98h, 0FEDCh</b>		
<b>B</b>	<b>3210h, 7654h</b>		
<b>C</b>	<b>5980h, 541Dh, 9046h, 75CDh</b>		

Fig: Result matching with online calculator