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

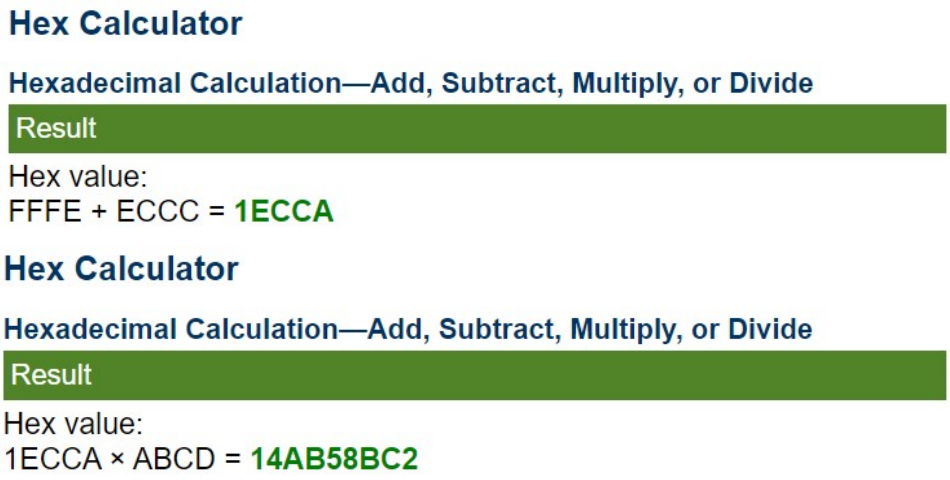
Adding two 16 bit numbers and multiplying the result with another 16 bit number

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:

Fig: Output matching the example in problem statement



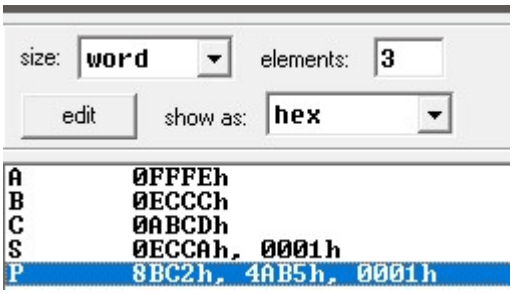


Fig: Second demonstration using different values and comparing to online calculator

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:

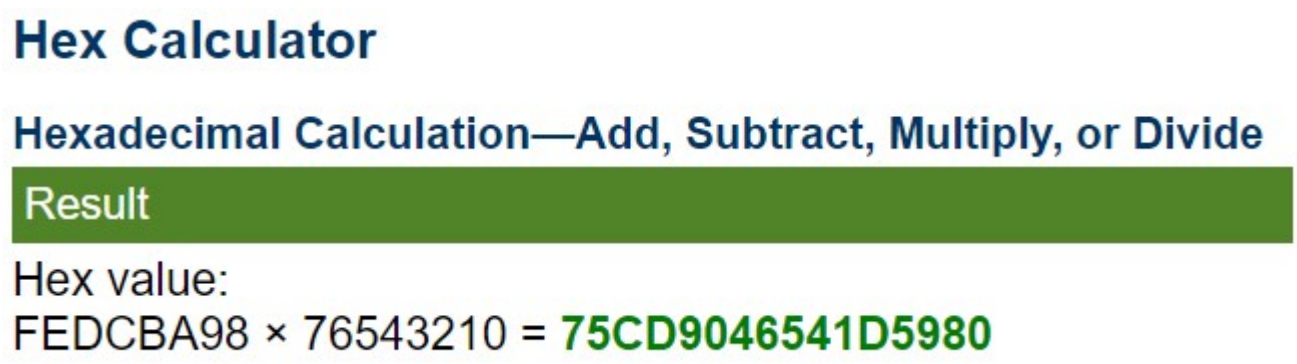


Fig: Multiplication result from online calculator

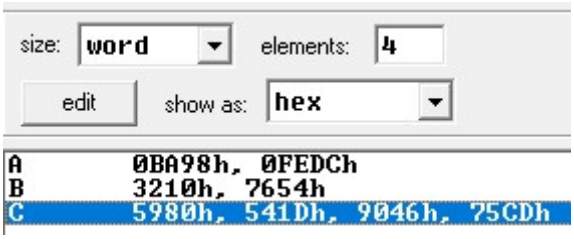


Fig: Result matching with online calculator