HW4

- Due Feb 12 by 5pm
- Points 100
- Submitting a file upload
- File Types docx, pdf, asm, and lst
- Available Jan 28 at 8am - Feb 19 at 5pm

This assignment was locked Feb 19 at 5pm.

HW # 4: Theme: Debugging, Flags, Data Declarations

All main questions carry equal weight.

(Credit will be awarded to only those answers for which work has been shown.)

Note: For Problems 1 to 6, you must NOT program on computer. Only handwritten answers are required. For Problem 7, you must code the program inside the Visual Studio/MASM environment and submit a screenshot showing the output of you running your code. You must also provide your code in the Word/PDF file you are submitting. The above-mentioned screenshots should also be embedded in the same file.

1. (Flags) A. What will be the value of the flags after the following operations (write 'x' for unknown). Show work by writing by hand.

```
Mov AL, 7Fh; SF =

OR AL, AL;  SF =

ADD AL, 1; SF =   ; OF =

ADD AL, 50; CF =
mov al, 37h;
add al, 11h; PF =
```

2. Given the following data declarations:

```
.data
 MyArray  BYTE 4Eh, 64h, 9Ah, 7Fh, 3Ch
 Total    WORD ?

.code
```

Write instructions that sum the elements of the array into AX and then save the resultant sum in the location Total.

3. (Little Endian) Fill in the requested register values after the executions of the instructions:

Show the memory map using an address-data table.

```
.data
;assume data segments starts at memory address 0x0040 2070
myBytes      BYTE   34h, 6Bh, 12h, 0AEh
myWords      WORD   25E8h, 19F2h, 0C133h, 2479h, 0DA2Dh
myDoubles    DWORD  31D2h, 0D124h, 57A2h, 0E396h, 13A4h
myPointer    DWORD  myDoubles

.code
     mov esi, OFFSET myBytes              ;          ESI =
     mov ax, WORD PTR [esi+1]             ;          AX =
     mov eax, DWORD PTR myWords           ;          EAX =
     mov esi, myPointer
     mov ax, WORD PTR [esi+2]             ;          AX =
     mov ax, WORD PTR [esi+3]             ;          AX =
     mov ax, WORD PTR [esi-2]             ;          AX =
```

4. What is the value of ax after each of the following instructions?

```
.data
myArray WORD 2 DUP (5), 2330, 97, 0CDEh, 4 DUP (30)

.code
     mov ax, TYPE myarray            ; AX =
```

```
        mov ax, sizeof myarray          ; AX =
        mov ax, lengthof myarray        ; AX =
```

5. (Sign Extension) Fill in the requested register values after executions of the instructions:

```
    .code
        mov bx, 0F26Bh
        movzx eax, bx                   ; EAX =
        movzx edx, bh                   ; EDX =


        mov bx, 0D312h
        movsx eax, bx                   ; EAX =
        movsx edx, bl                   ; EDX =
```

6. (Indirect, Little Endian) What will be the value of the destination operand after each of the following instructions execute?

```
.data
var1 BYTE    7, 6, 0Fh, 3
var2 WORD    2122h, 9396h, 0F10Dh, 9527h
var3 SWORD   -55, -25
var4 DWORD   21B3h, 40C2h, 4CAFh, 5D79h

.code
     mov ax, [var1+1]                          ;  AX  =
     mov ax, [var2+2]                          ;  AX  =
     mov ax, var3                              ;  AX  =
     mov ax, [var3-2]                          ;  AX  =
```

7. Write a program that prints your <FirstName Lastname> on your screen. You can use the template provided. Assemble and generate the output using MASM and Visual Studio. Embed your output in your submission. (Group work: do it with a friend, submit individually and write the names of the group members)

```
TITLE My first assembly program
INCLUDE Irvine32.inc
.DATA
Message BYTE “FirstName Lastname”,0
.CODE
main PROC
      mov edx, offset message
      Call WriteString
exit
main ENDP
END main
```