CSC 3210 – Assignment #4 Fall 2021 Due 11/18/21, 11:59 PM

1. (9 points) Write an assembly program to implement the following.

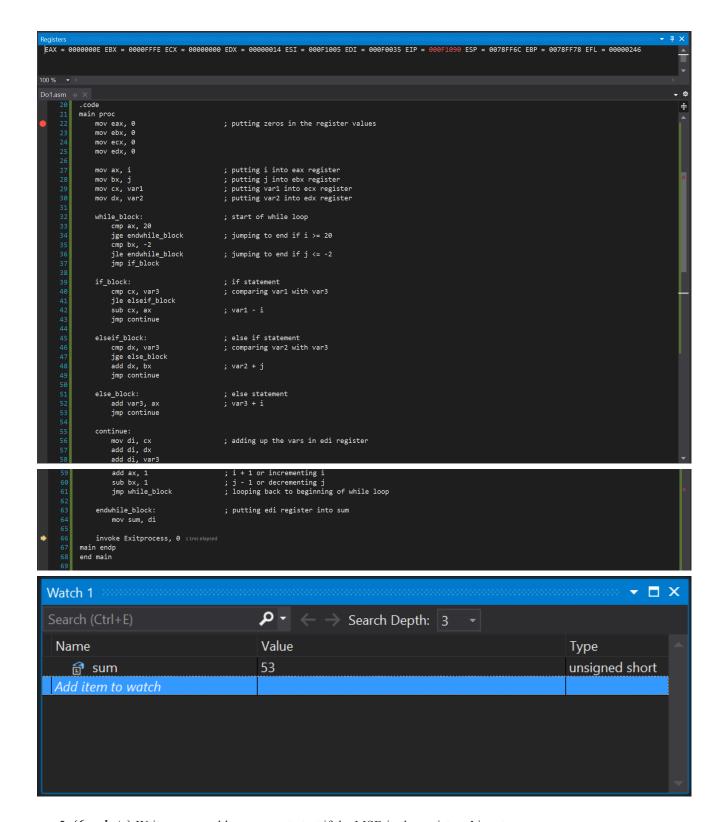
```
sum = 0
i = 0
j = 12
var1 = 3
var2 = 3
var3 = 0
while ((i < 20) \text{ and } (j > -2))
 if (var1 > var3):
var1 =var1 - i
else if (var2 < var3):</pre>
var2 = var2 + j
 else:
 var3 = var3 + i
 sum = var1 + var2 + var3
 i = i+1
 j = j-1
```

- Use short-circuit evaluation
- Assume that A, B, and X are 16-bit signed integers variables
- You are not allowed to make any logical reduction to the code. You need to implement it the way it is provided.

Submit the following:

- Rename the asm file using your last name as Lastname1.asm and submit it.
- Screenshot of the code
 - Then run the code until you reach INVOKE ExitProcess, 0
 - Then take a screenshot of the watch window showing Sum variable content.

Screenshot(s):



- **2.** (6 points) Write an assembly program to test if the MSB in the register al is set:
 - If it is set, then divide the content of **al** by 8 using the appropriate shift instruction and exit.
 - Else, if it is not set, then multiply the content of al by 4 using the appropriate shift instruction and exit.
 - When checking al MSB, do not change al content.
 - Assume that al is equal to the signed integer 88h.
 - You need to come up with the appropriate *mask* to check the MSB.
 - Run your program using the debugger to verify your answers.
 - Submit the following:
 - Rename the asm file using your last name as Lastname2.asm and submit it.

- Screenshot of the code
 - Then run the code until you reach INVOKE ExitProcess, 0
 - Then take a screenshot of the register window.

Screenshot(s):

```
004 EBX = 004AA000 ECX = 00DD100A EDX = 00DD100A ESI = 00DD100A EDI = 00DD100A EIP = 00DD10D5 ESP = 0073FA5C EBP = 0073FA68 EFL = 0
100 %
          ; Vivian Do
          ; Class: CSC 3210
          ; Assignment 4 Question 2
; This program will test if MSB in al register is set
; If set, al is divided by 8 using shift and exiting; if not set, al is multiplied by 4 using shift and exiting
           .model flat, stdcall
           .stack 4096
          ExitProcess proto, dwExitCode:dword
           .code
           main proc
                                                     ; putting zeros in the register values
               mov al, 88h
               test al, 1000000b
jnz msb_set
sal al, 2
                                                     ; bit masking to check MSB
                                                     ; msb is set
; msb is not set
               msb_set:
               invoke Exitprocess, 0 ; End Results: AL = F1 ≤1ms elapsed
          main endp
           end main
```

Note:

• Comment header for .ASM files:

Student Name Class: CSC3210

Assignment#: 4

Description: This program

• Follow the program standards as presented in your book. Pay more attention to code comments and consistent indentation.

• Create a new project for every question. Do not use one project with multiple .asm files.