60 pts

Name: _____

Class Day / Time: _____

Due Date: _____

Assignment #3 – Assembly - Division/Procedure

In this assignment you will write **two** x86-assembly programs to divide two unsigned integer numbers. Each program will read two numbers from the console; calculate the result of the division and output the result to the console. The first number will be dividend of the division and the second number will be the divisor. You will also need to have a **procedur**e to check the input to be within the **range from 1 to 200**. Finally, you will need to **round off** the quotient to the nearest whole number.

The first program will calculate the result of the division using multiple subtractions, using an assembly SUB and LOOP instructions. The second program will calculate the result of the division using an assembly DIV instruction.

Instruction	**Comment**	**Code**	**Operation**
SUB	Subtract	SUB Dest, Source	Dest = Dest - Source
LOOP	Counting Loop	LOOP Dest	ECX = ECX – 1; If ECX != 0; jump Dest
DIV	Divide (unsig.)	DIV Op (8-bits)	AL = AX/Op *

*non integer results are always truncated.

The programs will have the following steps:

1) Call procedure to read each number from console within the correct range. If the incorrect number is entered, the procedure should ask the user to re-enter the number in the correct range. You need to define the necessary parameter(s) and return value(s) for your procedure
2) Implement the division using the appropriate method described above. You will divide the first number by the second number
3) If using the subtraction method, implement the round off if necessary (see details following)
4) Display the result at the console

The pseudo-code for the round off is as follow:

IF ((2*Remainder – Divisor) > 0)
  THEN Quotient = Quotient + 1

Draw a flowchart and **write the corresponding assembly language program** in the flowchart for each program you are implementing. It is not necessary to indicate memory locations in the flowchart, but include **all the variable** declaration as part of the flow chart.

Implement the two programs; test each program a number of times with a different data. You may limit the numbers to one unsigned byte (< 256). You will need to turn in **three** test runs for each program:

a. Result produces an exact division
b. Result where the quotient must be round off (this case will not work for the DIV method)
c. Result where the quotient must be truncated

Turn in (STAPLED IN THIS ORDER)

1. The **FIRST PAGE** of this assignment as a coversheet
2. Include the **flowcharts** properly documented. The listing of **.asm source codes** properly documented.
3. The **three** output from each program, either pasted into .asm source code or using print screen