CST 370
Programming Assignment (Stacks)

1. Download the sample code of a stack class (**Stack class namely, Stack.h, Stack.cpp, Sample_Stack_tester.cpp**) from the **iLearn**. Make a project with the three files.

Your assignment has two parts

a) Design an algorithm to sort a group of numbers in ascending order using two stacks. You can assume that the numbers are initially given to you in one of the stacks. You can assume that the stack data structure is available to you (i.e., you use can use the functions push, pop, top, isempty in the stack). Describe the steps of the algorithm in simple English (i.e., pseudo code).

b) Implement the above algorithm using the sample stack class provided to you on iLearn. Note that you do not need to change Stack.h and Stack.cpp files. You only need to make changes to the Sample_Stack_tester.cpp (i.e., the driver) file. In this assignment, you should begin by pushing the numbers (1, 5, 3, -3, 4, 8, 10, -5) on to the first stack in the given order.

After your program executes one of your stacks should contain the numbers sorted in ascending order (i.e., the top of the stack has the highest value). This means that your sorted stack should look like this.

10
8
5
4
3
1
-3
-5

Pop elements out of the stack and display them on the screen. Note that the numbers will be displayed in descending order, as the highest value is present at the top of the stack.

For the example stack given above, the numbers will be displayed in the following way.
10, 8, 5, 4, 3, 1, -3, -5

Test the functioning of your program with two other sample inputs

Sample Input 1: 1, 5 -4, 6, 2

Sample Input 1: -1, -4 -4, 6, 6, 9

Grading

I will download your code on my computer and execute it. If your code does not compile, you may lose more than 50% of your points (based on my discretion). If your code compiles, but still produces incorrect results you may still lose more than 30% of your points (based on my discretion).

Your code should have the following characteristics for you to get full points on the assignment

1. Compile without error.
2. Produce correct output.
3. Good programming structure.
4. Comments. (Title, Abstract, Author, ID, and Date are mandatory.)
5. Meaningful and related variable names.

Extra credit

You will receive extra credit equal to 10% of your score if you submit a video (a link) explaining how you implement it (as well as some running samples of your program). Note that there is a separate place for you to submit the video link and that is where extra credit will be recorded. It should be submitted before the submission is closed (i.e., two days after the submission due date), but not subject to the late submission penalty. I will initiate a new topic on Discussion Forum for you to publish the video link to the class.

What to turn in?

Submit your source programs **and 'HomeworkSubmission_yourlastname.pdf'** as a single zipped file ***'Program2_yourfullname'*** on iLearn.

If you do not submit the above mentioned documents in the format specified your assignment will not be graded. You will get 0 points for your assignment.

Homework Submission_yourlastname.pdf

For each homework problem, you are expected to submit screenshots of the results obtained from running your code. You should also explain what each screenshot means and why the result on the screenshot is correct.

This link explains how to take screenshots in Mac and Windows.
http://www.take-a-screenshot.org/