ECCS 1611 – Programming 1

Lab 6 – **Programming practice with iteration.**

Please write the following programs using Visual Studio. When completed, please demonstrate each program to either your instructor or a lab assistant.

**P6.1** Write a program that reads an integer *n*, with *n* ≥ 2, and displays, using asterisks, a ﬁlled diamond of the given side length. For loops must be used to solve the problem. **For hints please refer to Table 3 in Section 4.8 of your textbook** and <https://www.w3resource.com/cpp-exercises/for-loop/cpp-for-loop-exercise-44.php>.

Example run (with user input indicated with ***bold italics***):

Enter number of asterisks per side: ***4***

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**P6.2** Write a program that reads a set of floating-point data values that uses an appropriate sentinel for indicating the end of the data set. When all values have been read, print out the count of the values, the average, and the standard deviation. Notes: The average of a data set { *x1, . . ., xn* } is:



where *n* is the number of input values. The standard deviation is:



You can compute this quantity by keeping track of the count, the sum, and the sum of squares as you process the input values. Information on performing square roots can be found in Section 2.2.5 of your textbook.

Hint: you need to make sure you have: #include <cmath>

Example runs (with user input indicated with ***bold italics***):

**Run #1**:

Enter numbers - Q to quit: ***1 2 3 4 5 q***

n = 5, average = 3, standard deviation = 1.58114

Press any key to continue . . .

**Run #2:**

Enter numbers - Q to quit: ***q***

No data to process - exiting...

Press any key to continue . . .