CPSC 230: Computer Science I
Spring 2020
Programming Assignment 7
Due: April 15, 2020 @ 11:59pm

Overview

Implement the following problem as a self-contained python module.

Write a program that continually prompts the user for positive integer values and stores them in a list. You should stop prompting when the user enters a negative integer value.

When the user is done entering values, you should print the list of integers they have provided in sorted order. You should then compute the mean and standard deviation of the values in the list.

Recall that the mean is just the arithmetic average...the sum of all the values divided by the number of values. In mathematics notation we represent the mean with the Greek letter mu, μ.

In statistics, standard deviation is the square root of variance and measures how much, on average, values deviate from the mean. So consider a list of N numbers, with mean mu, μ:

Variance = $\sigma^2 = \frac{\Sigma(N_i - \mu)^2}{N}$ where N_i is the value at position i in the list.

Standard Deviation = $\sigma = \sqrt{\sigma^2} = \sqrt{Variance}$

You should not be using any built in modules that calculate variance/standard deviation for you, you need to code this on your own.

In order to make your program as modular as possible, however, you should define your own functions to carry out the computation. These functions should be:

- print_sorted – takes a list of integers as input and prints them in sorted order
- compute_mean – takes a list of integers as input and returns the mean (average) of the list
- compute_variance – takes a list of integers as input and returns the variance of the list. (Note that this method can call the computeMean method.)
- compute_standard_dev – takes the variance as input and returns the standard deviation (just the square root of variance).

Due Date:

This assignment is due at 11:59 pm on 4-15-2020. Submit via Canvas. It should be labeled firstinitiallastname_Assignment7. Please make sure to include all the required files (README, source files).

Grading:

Your program will be evaluated for correctness and elegance. In particular, you should make sure your code is properly commented and obeys standard naming conventions.