(Playing with Array and Probability Theory)

Greetings Students. Do not panic after watching the title of this lab. We are not going to teach you probability theory in depth (at least not in this lab!!!). In this lab, we will play with numbers and arrays. In this lab, you are going to implement something from the scratch!!! The lab task is divided into three parts. What are the parts!!!

1. You need to find the mean of a series of numbers stored in an array.
2. You need to calculate the sample standard deviation of those numbers. 3. You need to create a new array where you will only store the numbers that are at least 1.5 standard deviations away from the mean.

If you are wondering "I don't know all the theories for calculating all these mean and standard deviations!!!!!" Just spare some time to follow the links:

● How to calculate the mean and standard deviation: https://youtu.be/IaTFpp-uzp0 ● How to find numbers that are a certain Standard Deviation away from the mean: https://youtu.be/VB-FzD_REfc
● Mean calculation: https://www.mathsisfun.com/mean.html
● Standard deviation calculation: https://www.mathsisfun.com/data/standard-deviation formulas.html (Use Sample Standard Deviation Formula (N - 1))

For example, if you are dealing with an array with the following numbers:

[10, 8, 13, 9, 14, 25, -5, 20, 7, 7, 4]

The mean of the numbers is: 10.181818181818

The standard deviation is: 7.96

New array: [25, -5]

Explanation:

The mean of the numbers is 10.18 and the standard deviation is 7.96. Only 25 and -5 are at least 1.5 standard deviations away from the mean. And so the new array's length is 2 and only

two items are copied.
Hints to implement this program:

1. Create a function that will take an array and return the mean of the values 2. Create a function that will take an array and return the standard deviation of the values 3. Create a function that will take an array and create a new array whose length will be the
   total number of values of the array which are 1.5 standard deviations away from the mean of that array. Finally, return the new array. If there is no such value then return None.
4. Write the driver code and call the above-created functions. You can use an array with your preferable length and values to test your program.

Try this code, solving this might be a fun experience. And remember,

Confusion is part of programming. — Felienne

Hermans PS: Plagiarism will not be tolerated.