

cs171: Introduction to Programming
Programming Assignment 7

Due Date: Friday, March 3

Points: 40

In this program we will be computing the mean and standard deviation for a collection of exam scores. The exam scores will all be between 0 and 100. There will be n of them (a variable in your program).

First, the mean is the average exam score. This is easy to compute, we have computed an average several times in this course.

Next we need to compute the variance. The *variance* is the average squared difference between the exam scores and the mean. In other words, it is an average of how far away each exam score is from the average. Compute a particular difference as $(score - mean)^2$; notice the squared power. Now we add up all these differences (one per exam) and divide by n to find the average difference. This is called the variance. The standard deviation is simply the square root of the variance.

An example: 70, 90, 100, 85. Mean = $\frac{70+90+100+85}{4} = 86.25$. Variance = $\frac{(70-86.25)^2+(90-86.25)^2+(100-86.25)^2+(85-86.25)^2}{4} \approx 117.19$. Standard deviation = $\sqrt{117.19} \approx 10.8$.

- Prompt the user to enter an integer n . Then create an array to hold n other integers. Now read in and store these additional n integers from the keyboard. These n numbers are our exam scores.
- Use a loop to now compute the mean.
- Use another loop to now compute the variance. Then compute the standard deviation.
- The following are the exam scores from our first midterm: 99 95 93 94 92 91 91 89 87 87 86 85 70 66 63. Compute the mean and standard deviation for these scores. Add an extra line to the comment block at the top of your program where you indicate the mean and standard deviation for these scores.
- Follow the guidelines of formatting, variable naming, and commenting.

Name your program `ExamStats.java` and email me the source code before the start of class on Friday, March 3.