# GLAB 330.2.2 - Standard Deviation

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**Rajeev Vishwamitra**

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**Introduction:**

**Standard Deviation** **(*σ*)** in statistics, typically denoted by **σ**, is a measure of how much a data set varies (dispersion) between values in a set of data. The lower the standard deviation, the closer the data points tend to be to the mean (or expected value), **μ**. In this lab, we will demonstrate how to calculate the standard deviation.

## Learning Objective:

By the end of this lab learners will be able to calculate the standard deviation.

**Given Dataset**

Imagine that we have the following data set representing the number of books read by five learners in a month:

|  |
| --- |
| **Number of Books (X)** |
| 12 |
| 9 |
| 7 |
| 18 |
| 4 |
| 22 |
| 10 |
| 9 |

1. **Calculate the mean:**

***Mean*** = (12 + 9 + 7 + 18 + 4 + 22 + 10 + 9)/8 = 91/8 = ***11.375***

1. **Calculate the squared differences from the mean for each data point:**

(12 - 11.375)^2 = (0.625)^2 = 0.390625

(9 - 11.375)^2 = (-2.375)^2 = 5.640625

(7 - 11.375)^2 = (-4.375)^2 = 19.140625

(18 - 11.375)^2 = (6.625)^2 = 43.890625

(4 - 11.375)^2 = (-7.375)^2 = 54.390625

(22 - 11.375)^2 = (10.625)^2 = 112.890625

(10 - 11.375)^2 = (-1.375)^2 = 1.890625

(9 - 11.375)^2 = (-2.375)^2 = 5.640625

1. **Calculate the average of these squared differences (variance):**

***Variance*** = (0.390625 + 5.640625 + 19.140625 + 43.890625 + 54.390625 + 112.890625 + 1.890625 + 5.640625)/8 = 243.875/8 = ***30.484375***

1. **Calculate standard deviation:**

***Standard Deviation*** = sqrt(30.484375) = ***5.5212657***

**Canvas Submission Instructions:**

* Upload your project to your GitHub account without setting it to private.
* Utilize the `README` file for any necessary additional instructions.
* Incorporate suitable comments throughout your project.
* Share the GitHub link on Canvas by clicking on the "Start Assignment" button located in the top-right corner of the Assignment page.