**GLAB 330.2.2 - Standard Deviation**

**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)** |
| 2 |
| 4 |
| 4 |
| 4 |
| 5 |
| 5 |
| 7 |
| 9 |

My dataset:

|  |
| --- |
| **Number of Pets Each Neighbor Has (X)** |
| 3 |
| 0 |
| 1 |
| 1 |
| 2 |
| 3 |
| 4 |
| 6 |
| 2 |
| 2 |

**Instructions:**

Here are the steps to calculate the standard deviation:

* **Calculate the mean (average) of the data set:**



3 + 0 + 1 + 1 + 2 + 3 + 4 + 6 + 2 + 2 24

X= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_ = **2.4**

10 10

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



|  |
| --- |
| Calculated squared differences from the mean for each data point: |
| (3 - 2.4)2 = (0.6)2 = 0.36 |
| (0-2.4)2 = (-2.4)2 = 5.76 |
| (1-2.4)2 = (-1.4)2 = 1.96 |
| (1-2.4)2 = (-1.4)2 = 1.96 |
| (2-2.4)2 = (-0.4)2 = 0.16 |
| (3 - 2.4)2 = (0.6)2 = 0.36 |
| (4 - 2.4)2 = (1.6)2 = 2.56 |
| (6 - 2.4)2 = (3.6)2 = 12.96 |
| (2-2.4)2 = (-0.4)2 = 0.16 |
| (2-2.4)2 = (-0.4)2 = 0.16 |

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



0.36 + 5.76 + 1.96 + 1.96 + 0.16 + 0.36 + 2.56 + 12.96 + 0.16 + 0.16 26.4

Variance = 10 = 10 = 2.64

* **Take the square root of the variance to get the standard deviation:**



Standard deviation = square root of 2.64 = 1.6248076809

The standard deviation of the number of books read by these students is **2**. This means that on average, the number of books read by each student deviates from the mean by **2** books.

**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.