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**Standard Deviation and Variance**

Standard Deviation and Variance are very similar. They both measure the dispersion of a set of values within a dataset. There difference lies in the scale of their measurements, Interpretability, use in calculations and the units used to represent the values.

* Variance:

A comparison of equations and formulas

Description automatically generated with medium confidence

- Quite simply, Variance is calculated by taking the average of the squared differences between each data point and the mean.

* Standard Deviation:

A black square with a square and square root

Description automatically generated with medium confidence

Standard Deviation (σ):

Standard deviation is simply the square root of the variance. It is used to express the spread of the data in the same units as the original data, making it more interpretable. In this formula the n represents the number of data points, the xi represents each individual data point and Xbar is the mean of the dataset.

As previously mentioned, the units are different, Variance, is in squared units of the original data whilst Standard deviation is in the same units as the original data. And in terms of scale, Variance is highly sensitive to outliers. It also gives more significance to larger differences from the mean because the value is squared. Conversely Standard Deviation gives less significance to larger differences from the mean because it takes the square root of the values, greatly reducing the impact of these outliers.

One final comparison that is recognized throughout the world of statistics, is that Standard Deviation is easier to interpret than Variance. This is because Standard Deviation shares the same units as the original data, however, variance is represented in square units. Taking all these similarities and differences into consideration it is important to note that both Standard Deviation and Variance serve their respective purpose and are utilized in situations that suit their application.