Title: Standard Deviation Vs. Variance

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Probability and Statistics play a major part when collecting and understanding data. However, there are a few terms that offer both similarities and differences between their definitions and examples. These terms are Standard Deviation (SD) and Variance. They both offer solutions that contribute to Data Analysis. Being able to distinguish one another is important as well as they provide two different purposes. To understand them takes more than just knowing their formulas. You must also understand their meaning, especially when dealing with important data to determine the next steps.

Standard Deviation is a way of measuring how far something is when given a set of data values. It is easier to understand than variance since it is stated in the same units as the data. It measures the usual separation between the mean and the data points. A higher SD indicates a wider range of data points. The formula for Standard Deviation is $\sigma = \sqrt{(\sum(x-\bar{x}) (x \ \bar{x}) 2 /n)}$. The variable N represents the number of values in the data set and X^{-} is the average. Since it is impacted by its mean, the Standard Deviation is sensitive to outliers which are the extreme numbers which is the same for Variance.

Variance is a measure used to see how far each number is from the mean and every other number in the set. This is more specific, unlike Standard Deviation since it individually deals

with each number and uses squared units which are much larger. The formula for Variance is $S^2= (\sqrt{(\sum(x-\bar{x})^2)}/ (n-1)$. It is also similar to Standard Deviation as the square root of Variance is the Standard Deviation. Variance is not used as much compared to SD but is also helpful for more complex situations like variability. The higher the variance, the more variability you will have in a set providing much more information than SD. While they are both different, the two terms correlate with each other a lot.

Standard Deviation and Variance both have different functions when dealing with Statistics. One is more general and dependable as it is easy to understand and execute. While the other is specific and provides much more insight about data. Despite the differences, they help with solving problems when finding calculations and Statistical Analysis. Using graphical models or finding numbers, they both help with finding variability, dispersion, and more importantly, solutions. Solutions that help people better understand how to use them not in just work or school, but in the real world.