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Calculate statistics with Python

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Measures of dispersion: Range, variance, and standard deviation

Recently, you learned that **measures of dispersion** let you describe the spread of your dataset, or the amount of variation in your data values. Measures of dispersion like standard deviation can give you an initial understanding of the distribution of your data, and help you determine what statistical methods to apply to your data.

In this reading, you'll learn more about three measures of dispersion: the range, variance, and standard deviation. This reading focuses on the foundational concept of standard deviation. As a data professional, you'll frequently calculate the standard deviation of your data, and use standard deviation as part of more complex data analysis.

Measures of dispersion

Let's examine out the definition of each measure of dispersion: the range, variance, and standard deviation.

Range

The **range** is the difference between the largest and smallest value in a dataset.

For example, imagine you're a biology teacher and you have data on scores for the final exam. The highest score is 99/100, or 99%. The lowest score is 62/100, or 62%. To calculate the range, subtract the lowest score from the highest score.

99 - 62 = 37

The range is 37 percentage points.

The range is a useful metric because it's easy to calculate, and it gives you a very quick understanding of the overall spread of your dataset.

Variance

Another measure of spread is called the **variance,** which is the average of the squared difference of each data point from the mean. Basically, it's the square of the standard deviation. You'll learn more about variance and how to use