Statistics - Descriptive Statistics

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Variance

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Informally, it measures how far a set of numbers are spread out from their average value.

Variance is calculated as average squared deviation of each value from the mean in a data set.

Example: Stock market or other investment returns. The stock market has return on average 7% per year. This does not mean that every year you get a 7% return, some years are more and some years are less. This variability (called volatility in stock terms) is an example of variance and standard deviation.

Standard Deviation

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The standard deviation is a measure that is used to quantify the amount of variation or dispersion of a set of data values.

It is useful in comparing sets of data which may have the same mean but a different range.

It is basically the square root of variance.

It is having the same unit as mean.

Example: A class of students took a math test. Their teacher found that the mean score on the test was an 85%. She then calculated the standard deviation of the other test scores and found a very small standard deviation which suggested that most students scored very close to 85%.

Covariance

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Covariance is a measure of the relationship between two random variables.

It is essentially a measure of the variance between two variables.

Positive covariance: Indicates that two variables tend to move in the same direction.

Negative covariance: Reveals that two variables tend to move in inverse directions.

Correlation Coefficient

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It calculates the strength of the relationship between the relative movements of two variables.

Or in other words,Correlation coefficients are used to measure the strength of the relationship between two variables.

The values range between -1.0 and 1.0.

Example: This measure used in recommendation system.