What is the definition of the Range Rule of Thumb and can you provide an example?

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The Range Rule of Thumb is a statistical tool used to estimate the variability of a data set. It states that the range of a data set is approximately four times the standard deviation. In other words, the difference between the highest and lowest values in a data set is about four times the average distance of the data points from the mean.

For example, if a data set has a mean of 50 and a standard deviation of 10, the range would be approximately 40 (4 x 10). This means that the majority of the data points fall within a range of 40 units from the mean. The Range Rule of Thumb is often used as a quick and easy way to estimate the spread of data without having to calculate the exact standard deviation. However, it should be noted that this rule is only an approximation and may not hold true for all data sets.

Range Rule of Thumb: Definition & Example

The range rule of thumb offers a quick and easy way to estimate the standard deviation of a dataset by using the following formula:

Standard deviation = range / 4

This rule of thumb is sometimes used because it allows you to estimate the standard deviation of a dataset by simply using two values (the minimum value and maximum value) instead of every value.

Example: Range Rule of Thumb

Suppose we have the following dataset of 20 values:

4, 5, 5, 8, 13, 14, 16, 18, 22, 24, 26, 28, 30, 31, 31, 34, 36, 38, 39, 39

The actual standard deviation of these values is 11.681.

Using the range rule of thumb, we would estimate that the standard deviation is (39-4) / 4 = 8.75. This value is somewhat close to the actual standard deviation.

Cautions on Using the Range Rule of Thumb

The obvious advantage of the range rule of thumb is that it's incredibly simple and quick to calculate. All we need to know is the minimum value and the maximum value of the dataset.

The drawback of the range rule of thumb is that tends to only work well when the data comes from a normal distribution and the sample size is around 30. When these conditions don't hold, the range rule of thumb doesn't perform well.

Alternative to the Range Rule of Thumb

In a2012 articlefrom the *Rose-Hulman Undergraduate Mathematics Journal*, Ramirez and Cox suggested using the following formula as an improvement over the range rule of thumb:

Standard deviation = range / (3√(ln(*n*))-1.5)

where *n* is the sample size.

Consider the same dataset we used before:

4, 5, 5, 8, 13, 14, 16, 18, 22, 24, 26, 28, 30, 31, 31, 34, 36, 38, 39, 39

This formula is a bit more complicated to calculate than the range rule of thumb, but it does tend to provide a more accurate estimate of the standard deviation when the data does not come from a normal distribution or when the sample size is not close to 30.

Range Rule of Thumb Calculator

Measures of Dispersion: Definition & Examples