What is the interpretation of the interquartile range and can you provide some examples?

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The interquartile range is a statistical measure that represents the spread or dispersion of a set of data. It is calculated by finding the difference between the upper and lower quartiles of a data set. The upper quartile marks the 75th percentile, meaning 75% of the data fall below this value, while the lower quartile marks the 25th percentile, meaning 25% of the data fall below this value. The interquartile range provides a better understanding of the variability within the middle 50% of the data, as it is less affected by extreme values. For example, if the interquartile range of a set of test scores is 15, it means that the middle 50% of students scored within a range of 15 points. This measure is useful in identifying the spread of data and can be used to compare the variability of different data sets.

Interpret Interquartile Range (With Examples)

The interquartile range of a dataset, often abbreviated IQR, is the difference between the first quartile (the 25th percentile) and the third quartile (the 75th percentile) of the dataset.

In simple terms, it measures the spread of the middle 50% of values.

IQR = Q3 - Q1

For example, suppose we have the following dataset that shows the height of 17 different plants (in inches) in a lab:

Dataset: 1, 4, 8, 11, 13, 17, 19, 19, 20, 23, 24, 24, 25, 28, 29, 31, 32

According to the , the interquartile range (IQR) for this dataset is calculated as:

Q1: 12Q3: 26.5IQR = Q3 - Q1 = 14.5

This tells us that the middle 50% of values in the dataset have a spread of 14.5 inches.

Why the Interquartile Range is Useful

The interquartile range is one way to measure the spread of values in a dataset, but there are other such as:

Range: Measures the difference between the minimum and maximum value in a dataset.Standard Deviation: Measures the typical deviation of individual values from the mean value in a dataset.

The benefit of using the interquartile range (IQR) to measure the spread of values in a dataset is that it is not affected by extreme outliers.

For example, an extremely small or extremely large value in a dataset will not affect the calculation of the IQR because the IQR only uses the values at the 25th

percentile and 75th percentile of the dataset.

To illustrate this, consider the following dataset:

Dataset: 1, 4, 8, 11, 13, 17, 19, 19, 20, 23, 24, 24, 25, 28, 29, 31, 32

This dataset has the following measures of spread

IQR: 14.5Standard Deviation: 9.25 Range: 31

Dataset: 1, 4, 8, 11, 13, 17, 19, 19, 20, 23, 24, 24, 25, 28, 29, 31, 32, 378

We could use a calculator to find the following measures of spread for this dataset:

IQR: 15Standard Deviation: 85.02Range: 377

Notice that the interquartile range barely changes when an outlier is present, while the standard deviation and range both dramatically change.

Comparing Interquartile Ranges Between Datasets

The interquartile range can also be used to compare the spread of values between different datasets.

For example, suppose we have three datasets with the following IQR values:

IQR of dataset 1: 13.5IQR of dataset 2: 24.4IQR of dataset 3: 8.7

This tells us that the spread of the middle 50% of values is largest for dataset 2 and smallest for dataset 3.