

What is the interquartile range and how is it used in statistics?

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The interquartile range, also known as the IQR, is a measure of variability in a dataset. It is calculated by finding the difference between the third quartile and the first quartile. In other words, it represents the range of the middle 50% of data values in a set, excluding the highest and lowest 25%. This measure is useful in statistics as it helps to identify the spread of the data and detect outliers. It is also commonly used in box plots to visually represent the spread of the data. The IQR is a robust measure, meaning it is less affected by extreme values or skewed data, making it a valuable tool in data analysis.

Statistics - Interquartile Range

Interquartile range is a measure of variation, which describes how spread out the data is.

Interquartile Range

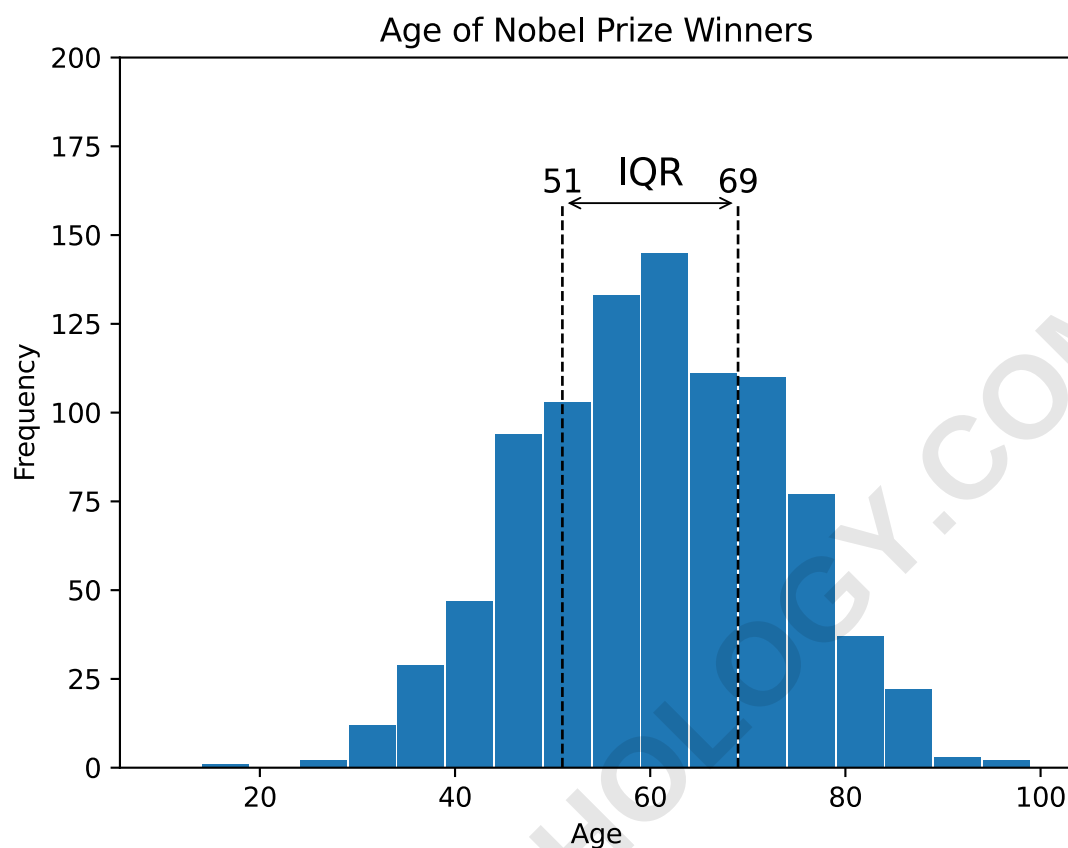
Interquartile range is the difference between the first and third quartiles (Q1 and Q3).

The 'middle half' of the data is between the first and third quartile.

The first quartile is the value in the data that separates the bottom 25% of values from the top 75%.

The third quartile is the value in the data that separates the bottom 75% of the values from the top 25%

Here is a histogram of the age of all 934 Nobel Prize winners up to the year 2020, showing the **interquartile range (IQR)**:



Here, the middle half of is between 51 and 69 years. The interquartile range for Nobel Prize winners is then 18 years.

Calculating the Interquartile Range with Programming

The interquartile range can easily be found with many programming languages.

Using software and programming to calculate statistics is more common for bigger sets of data, as finding it manually becomes difficult.

Example

With Python use the SciPy library `iqr()` method to find the interquartile range of the values 13, 21, 21, 40, 42, 48, 55, 72:

```
from scipy import stats
```

```
values =
```

```
x = stats.iqr(values)
```

```
print(x)
```

Example

Use the R `IQR()` function to find the interquartile range of the values 13, 21, 21, 40, 42, 48, 55, 72:

```
values <- c(13,21,21,40,42,48,55,72)
```

```
IQR(values)
```

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