What is the range of a box plot and how is it calculated?

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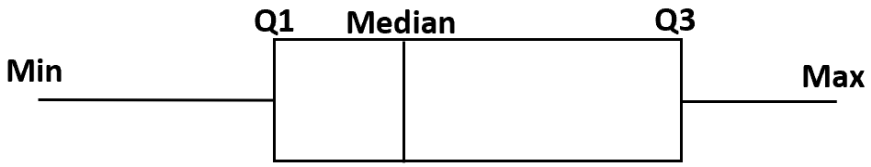
A box plot, also known as a box and whisker plot, is a visual representation of the distribution of a set of data. It is used to show the spread and central tendency of the data. The range of a box plot refers to the distance between the minimum and maximum values of the data set. It is calculated by subtracting the minimum value from the maximum value. The resulting number is then used to determine the length of the box in the box plot. This range provides a quick and easy way to understand the spread of the data and identify any outliers. It is important to note that the range is only one aspect of the box plot and should be considered in conjunction with other measures of central tendency and spread, such as the median and quartiles.

Find the Range of a Box Plot (With Examples)

A box plot is a type of plot that displays the five number summary of a dataset, which includes:

The minimum valueThe first quartile (the 25th percentile)The median valueThe third quartile (the 75th percentile)The maximum value

To make a box plot, we draw a box from the first to the third quartile. Then we draw a vertical line at the median. Lastly, we draw "whiskers" from the quartiles to the minimum and maximum value.

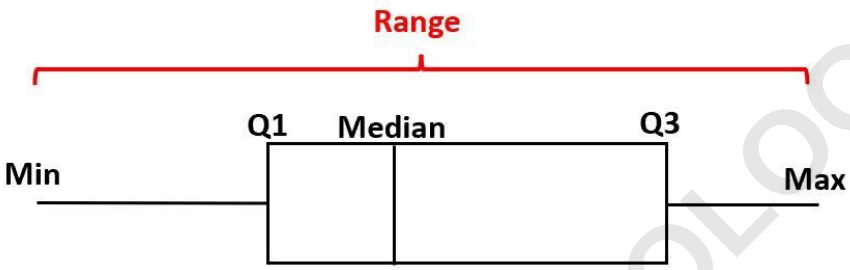


The range of a box plot is the difference between the

maximum and minimum value.

Range = Maximum - Minimum

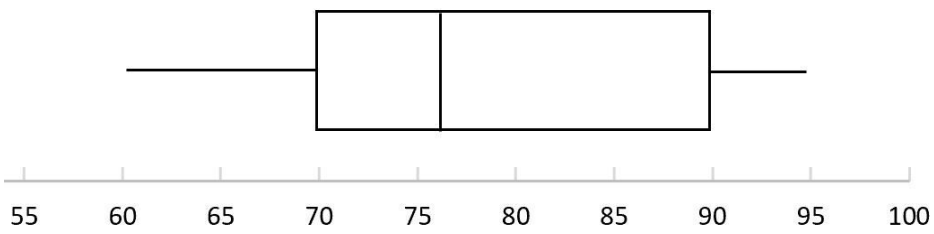
To find the range of a given box plot, we can simply subtract the value located at the lower whisker from the value located at the upper whisker.



The following examples show how to find the range of a box plot in practice.

Example 1: Exam Scores

The following box plot shows the distribution of scores on a certain college exam. What is the range of the exam scores?



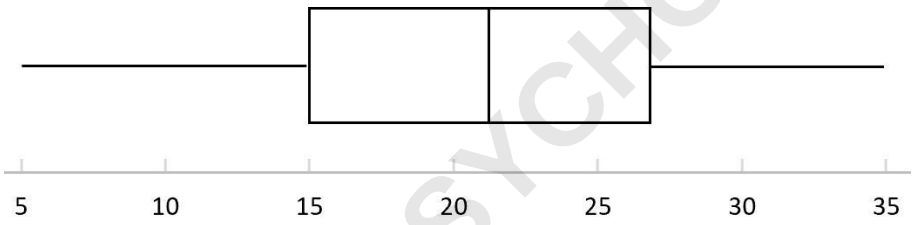
We can find the following values on the box plot to answer this:

Range = Maximum - MinimumRange = 95 - 60Range = 35

The range of the exam scores is 35.

Example 2: Points Scored

The following box plot shows the distribution of points scored by basketball players in a certain league. What is the range of the distribution?



We can find the following values on the box plot to answer this:

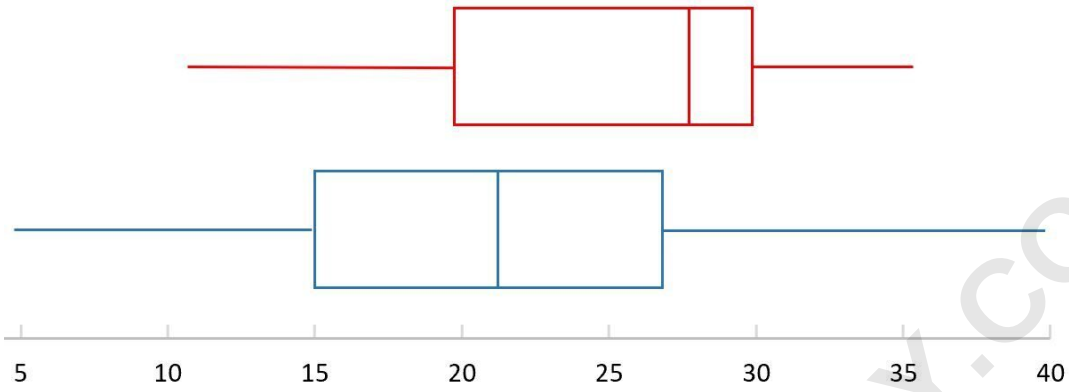
Range = Maximum - MinimumRange = 35 - 5Range = 30

The range of the distribution is 30.

Example 3: Comparing Plant Heights

The following box plots show the distribution of heights

for two different plant species: Red and Blue. Which distribution has a larger range?



First, let's find the range of the red box plot:

Range = Maximum - MinimumRange = 35 - 10Range = 25

Next, let's find the range of the blue box plot:

Range = Maximum - MinimumRange = 40 - 5Range = 35

The range for the Blue species is larger.

Additional Resources

The following tutorials provide additional information about box plots: