Displaying Data: Box Plots

Displaying Data



Displaying data helps us:

- organise information clearly
- identify patterns and trends
- compare data sets
- describe spread and variation

Types of data displays

The type of data display you choose depends on:

- the type of data being collected
- what you want to show or compare
- the patterns or trends you want to identify

Understanding a Box Plot

A box plot (box-and-whisker plot) displays the spread of data using the five-number summary.

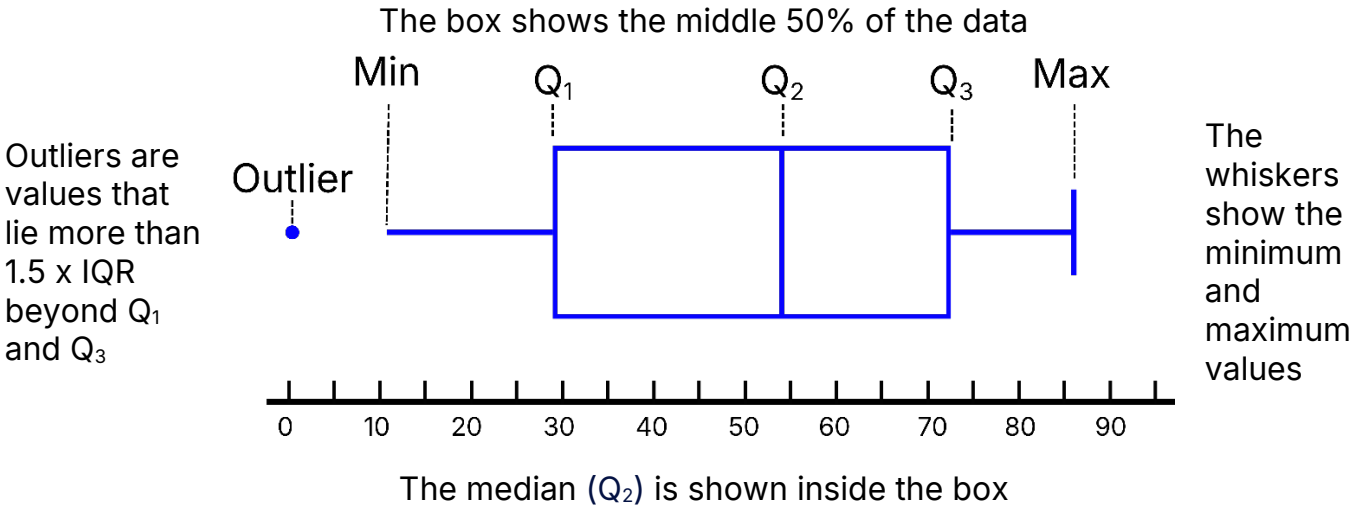
It is best used for:

- comparing distributions
- identifying spread and consistency
- identifying possible outliers

Features of a box plot

A box plot consists of:

1. Minimum
2. Q_1
3. Median (Q_2)
4. Q_3
5. Maximum



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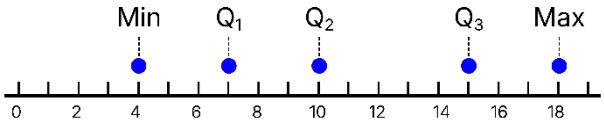
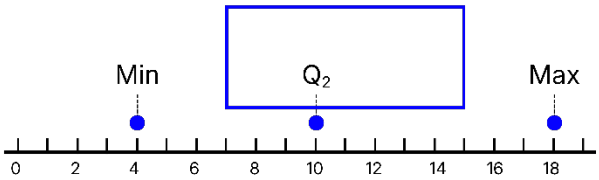
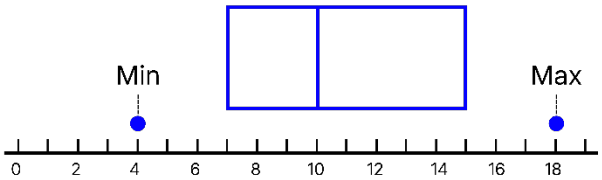
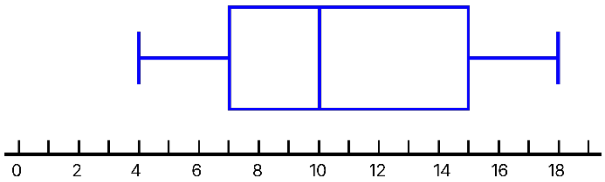
Constructing a Box Plot

Steps	Example
1. Calculate the five-number summary	Data: 4, 7, 9, 10, 12, 15, 18 Min 4 Q_1 7 Median 10 Q_3 15 Max 18
2. Plot the five-number summary values	
3. Draw the box from Q_1 to Q_3	
4. Draw the median line	
5. Draw whiskers to the minimum and maximum values	

Calculating an Outlier

An outlier is a data value that lies more than 1.5 times the interquartile range (IQR) beyond the quartiles.

Formulas

Lower fence:

$Q_1 - 1.5 \times IQR$

Upper fence:

$Q_1 - 1.5 \times IQR$

Data values outside these fences are considered possible outliers and are plotted separately on a box plot.

If a value lies exactly on a fence, it is not considered an outlier.

Related Helpsheets

- Standard Deviation

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