

Box-and-Whisker Plots Notes

Boxplots (or box-and-whisker and diagram)

Boxplots are graphs that are useful for revealing central tendency, and spread of data, the distribution of the data, and the presence of outliers (extreme scores).

To construct a boxplot requires that we obtain the minimum of score of the first quarter, the median or second quarter, the third quarter and the maximum score.

The Median is used to reveal the central tendency and the quartiles are used to reveal the spread of the distribution.

Boxplots don't show detailed information unlike other graph. However, boxplots are useful when comparing two or more data sets.

Quartiles of Ungrouped Data

Quartiles divide a distribution into four equal parts.

Q_3 is the 3rd quartile. $Q_3 = \frac{3N}{4} \text{th item}$

This means that 75% of the observations lie below this value.

Q_2 is the 2nd quartile. $Q_2 = \frac{2N}{4} \text{th item or median}$

Q_1 is the 1st quartile. $Q_1 = \frac{N}{4} \text{th item}$

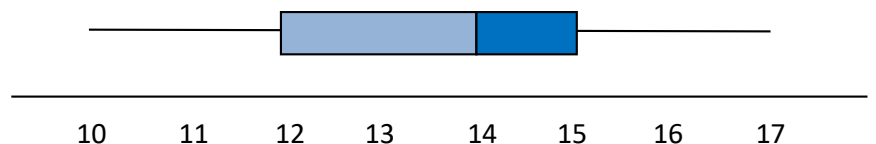
Sample Problem 1: Solve a problem involving box-and-whisker plots.

The following data are scores 1st year students of class S in the science quiz. Draw a box-and-whisker plots
12, 11, 13, 14, 15, 17, 12, 10, 15, 16 and 15

Solution:

Number of frequencies: 11

Arrange the data from ascending:
10, 11, 12, 12, 13, 14, 15, 15, 15, 16, 17



$Q_1 = \frac{11}{4} = 2.75$ or 3, $Q_2 = \frac{2(11)}{4} = 5.5$ or 6, and $Q_3 = \frac{3(11)}{4} = 8.25$ or 8

10, 11, (12), 12, 13, (14), 15, (15), 15, 16, 17

Box-and-Whisker Plots Notes

The distribution of the student's Scores in a Statistics Examination. Draw a box and whisker plots.

x	Frequency
10	7
11	12
20	20
24	12
33	5
Total	56

solution:

x	Frequency	
10	7	7
11	12	19
20	20	39
24	12	51
33	5	56
Total	56	

28 fall under 20

14 fall under 11

42 fall under 24

Add the frequency in ascending order up to the total frequency.

$$Q_1 = \frac{56}{4} = 14, \quad Q_2 = \frac{2(56)}{4} = 28, \text{ and } Q_3 = \frac{3(56)}{4} = 42$$

