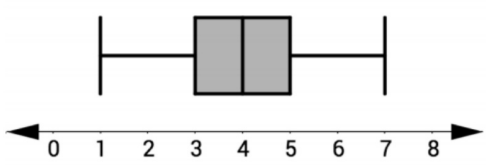
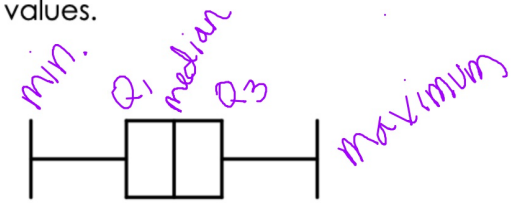
The following ***box plot*** graphically displays a summary of the data set $\{1, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 5, 6, 6, 7\}$.



A box plot displays the ***five-number summary*** for a data set.

- The five-number summary of a data set consists of the minimum, first quartile, median, third quartile, and maximum values.



Consider the following data set with an even number of data values.

$6, 2, 1, 4, 7, 3, 8, 5$

1,2|3,4|5,6|7,8

The minimum value of the data set is 1.

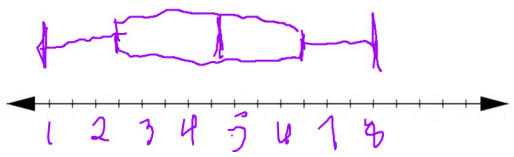
The maximum value of the data set is 8.

The median is the number in the middle when the data is ordered from least to greatest. The median of the data set is 4.5.

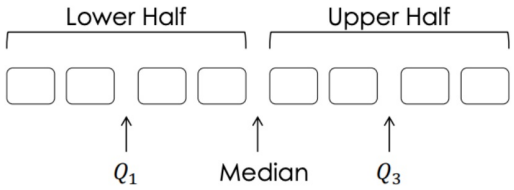
The first quartile of the data set is 2.5.

The third quartile of the data set is 6.5.

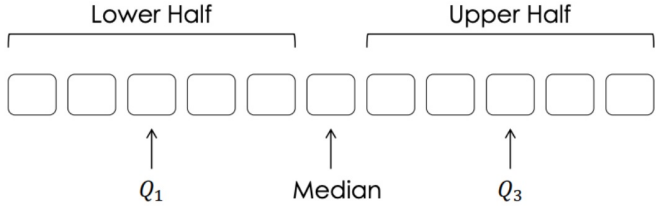
Use the five-number summary to represent the data with a box plot.



Even data set:



Odd data set:



Some observations from our box plot:

- The lowest 50% of data values are from 1 to 4.5
- The highest 50% of data values are from 4.5 to 8.
- The middle 50% (the box area) represents the values from 2.5 to 6.5.
  - The middle 50% is also known as the IQR (interquartile range).
- The first quartile represents the lower 25% of the data (25th percentile).
- The third quartile represents the first 75% of the data (75th percentile).
- 75% of the values are above Q_1.
- 25% of the values are above Q_3.
- The median of the lower half of the data is 2.5.
- The median of the upper half of the data is 6.5.

Consider the following data sets.

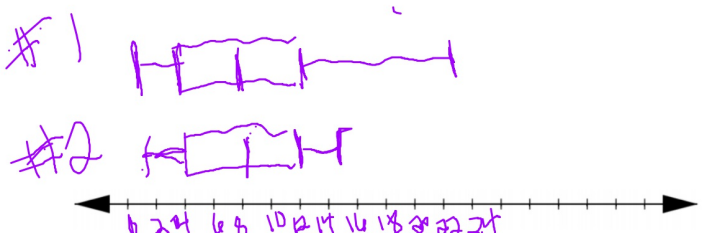
Data set #1: 1, 3, 5, 7, 9, 11, 13, 23

Data set #2: 1, 3, 5, 7, 9, 11, 13, 15

Complete the following table.

	Minimum	Maximum	Median	First Quartile	Third Quartile
Data Set #1	1	23	8	4	12
Data Set #2	1	15	8	4	12

Construct the box plots for both data sets, one above the other.



Compare and contrast both box plots.

Exactly the same! Except the max.

Explain which box plot is not symmetrical. Justify your answer.

#1 b/c the whisker is longer

Consider the following data set with an odd number of data values.

3, 7, 10, 11, 15, 18, 21

a. The minimum value of the data set is 3.

b. The maximum value of the data set is 21.

c. The median of the data set is 11.

d. The first quartile of the data set is 7.

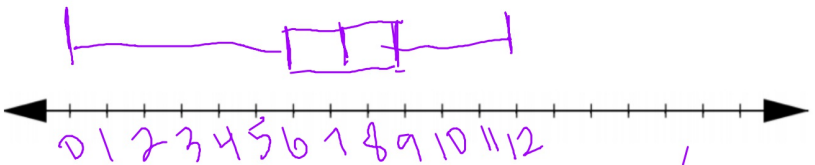
e. The third quartile of the data set is 18.

f. Use the five-number summary to construct a box plot.

The time, rounded to the nearest hour, that 26 tourists spent on excursions in Cat Island, Mississippi on a given day was recorded as follows. (Cat Island is not actually an island for cats.)

0, 3, 4, 4, 5, 5, 6, 6, 6, 7, 7, 7, 7, 8, 8, 8, 8, 9, 9, 9, 10, 10, 10, 11, 11, 12

a. Construct a box plot to represent the data. Label the minimum, maximum, first quartile, third quartile, and median.

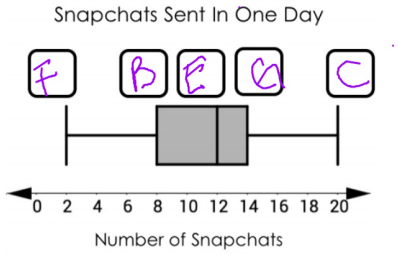


b. The bottom 25% of tourists spent, at most, 6 hours on excursions.

Mrs. Bridgewater recorded the number of Snapchats 10 different students sent in one day and constructed the box plot below for the data.

Part A: Use the following vocabulary to label the box plot.
Hint: You will not use all of the words on the list.

A. Average	**E.** Median
B. First Quartile	**F.** Minimum
C. Maximum	**G.** Third Quartile
D. Mean	



Part B: The 50^{th} percentile of the data set is 12.

Part C: Half of the data values are between

2 and 20.
8 and 12.
~~8 and 14.~~
10 and 12.

Part D: 75% of students send

12
13
~~14~~
15

or fewer Snapchats per day.

Part E: Add dots to the number line below to complete the dot plot so that it could also represent the data.

2 6 8 11 12 12 13 14 20 20