

Measures of Variation
9.4

Vocabulary

Measure of Variation->a measure that describes the distribution of a data set

Range->the difference between the greatest and the least value

First Quartile(Q_1)->the median of the lower half of a data set

Third Quartile(Q_2)->the median of the upper half of a data set

Interquartile Range (IQR)->the difference between the third quartile and the first quartile.

Finding the Range

The table shows the lengths of several Burmese pythons captured for a study. Find and interpret the range of their lengths.

Lengths (feet)	
18.5	8
11	10
14	15.5
12.5	6.25
16.25	5

1)Put numbers in order from least to greatest.

5, 6.25, 8, 10, 11, 12.5, 14, 15.5, 16.25, 18.5

Least Value = 5 Greatest Value = 18.5

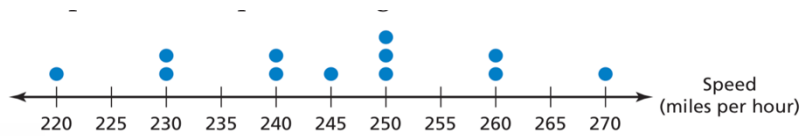
2)To find the range subtract the least value from the greatest value.

Range = $18.5 - 5 = 13.5$

This means that the lengths vary by no more than 13.5 feet.

Finding the Interquartile Range

The dot plot shows the top speeds of 12 sports cars. Find and interpret the interquartile range of the data.



1) Put the numbers in order from least to greatest.

220, 230, 230, 240, 240, 245, 250, 250, 250, 260, 270

2) Find the median. Remember the median is the middle number.

Since there are two middle numbers, 245 and 250, we need to find the mean (average) of these numbers.

$$\text{Mean} = \frac{245+250}{2} = \frac{495}{2} = 247.5$$

3) Find the 1st Quartile and 3rd Quartile

Median



220 230 230 240 240 245 **247.5** 250 250 250 260 260 270

LOWER HALF

UPPER HALF

1st Quartile = median of the lower half

Since there are two middle numbers, 230 and 240, we need to find the mean (average) of these numbers.

$$\text{Mean} = \frac{230+240}{2} = \frac{470}{2} = 235 \quad \leftarrow \text{1}^{\text{st}} \text{ Quartile}$$

3rd Quartile = median of the upper half

Since there are two middle numbers, 250 and 260, we need to find the mean (average) of these numbers.

$$\text{Mean} = \frac{250+260}{2} = \frac{510}{2} = 255 \quad \leftarrow \text{3}^{\text{rd}} \text{ Quartile}$$

4) Find the Interquartile Range

The Interquartile Range is the difference between the 1st and 3rd quartiles.

$$\text{Interquartile Range} = 255 - 235 = 20$$

This means that the middle half of the speeds vary by no more than 20 miles per hour.