

10.2 Measures of Variability

Measures of variability are used to describe the distribution of the data. One measure of variability is the range. The **range** of a set of data is the difference between the greatest and the least values of the set. It describes whether the data are spread out or clustered together.

Subtract

Example: Find the range for each set of data.

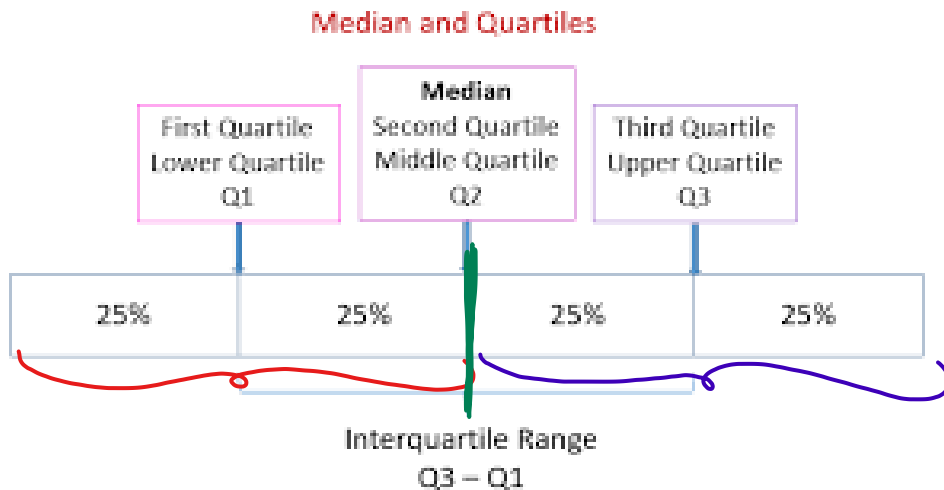
1.) $27, 8, 5, 19, 21, 10, 4, 21$

2.) $79, 42, 38, 51, 63, 91$

$$27 - 4 = 23$$

$$91 - 38 = 53$$

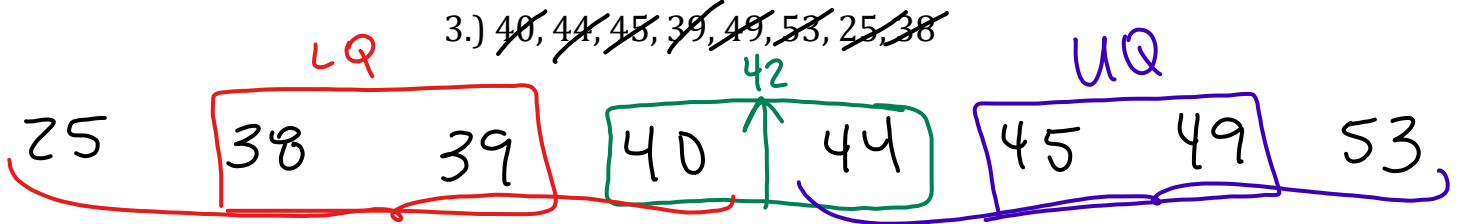
In a set of data, the **quartiles** are the values that divide the data into four equal parts. Recall that the median of a set of data separates the set in half.



The **interquartile range** is the range of the middle half of a set of data. It is the difference between the third quartile and the first quartile.

Example: Find the measures of variability for the data in the table.

3.) ~~40, 44, 45, 39, 49, 53, 25, 38~~



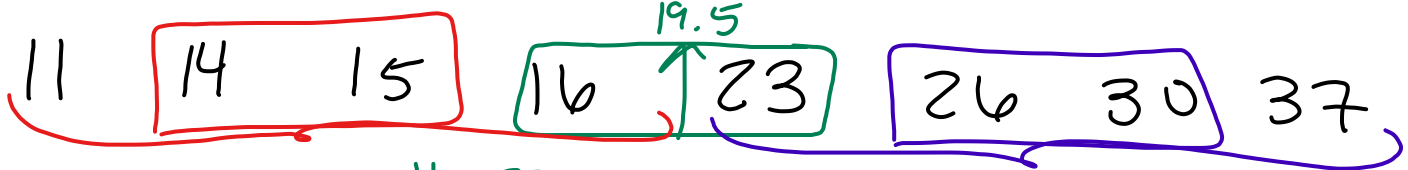
$$\text{Median: } \frac{40+44}{2} = \frac{84}{2} = 42$$

$$\text{UQ: } \frac{45+49}{2} = \frac{94}{2} = 47$$

$$\text{LQ: } \frac{38+39}{2} = \frac{77}{2} = 38.5$$

$$\begin{aligned} \text{IQR: } & \text{UQ} - \text{LQ} \\ & 47 - 38.5 \\ & 8.5 \end{aligned}$$

4.) 37, 30, 26, 15, 23, 14, 16, 11



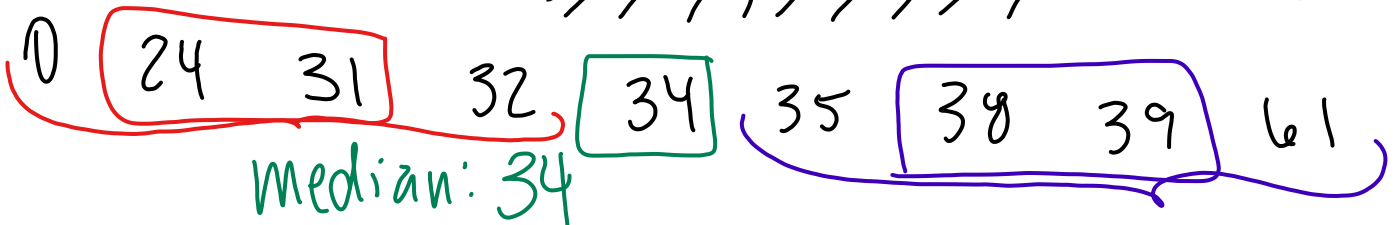
$$\text{Median: } \frac{16+23}{2} = \frac{39}{2} = 19.5$$

$$\text{UQ: } \frac{26+30}{2} = \frac{56}{2} = 28$$

$$\text{LQ: } \frac{14+15}{2} = \frac{29}{2} = 14.5$$

$$\begin{aligned} \text{IQR: } & \text{UQ} - \text{LQ} \\ & = 28 - 14.5 \\ & = 13.5 \end{aligned}$$

5.) ~~35, 31, 24, 0, 34, 39, 61, 32, 38~~



$$\text{Median: } 34$$

$$\text{UQ: } \frac{38+39}{2} = \frac{77}{2} = 38.5$$

$$\text{LQ: } \frac{24+31}{2} = \frac{55}{2} = 27.5$$

$$\text{IQR: } 38.5 - 27.5 = 11$$