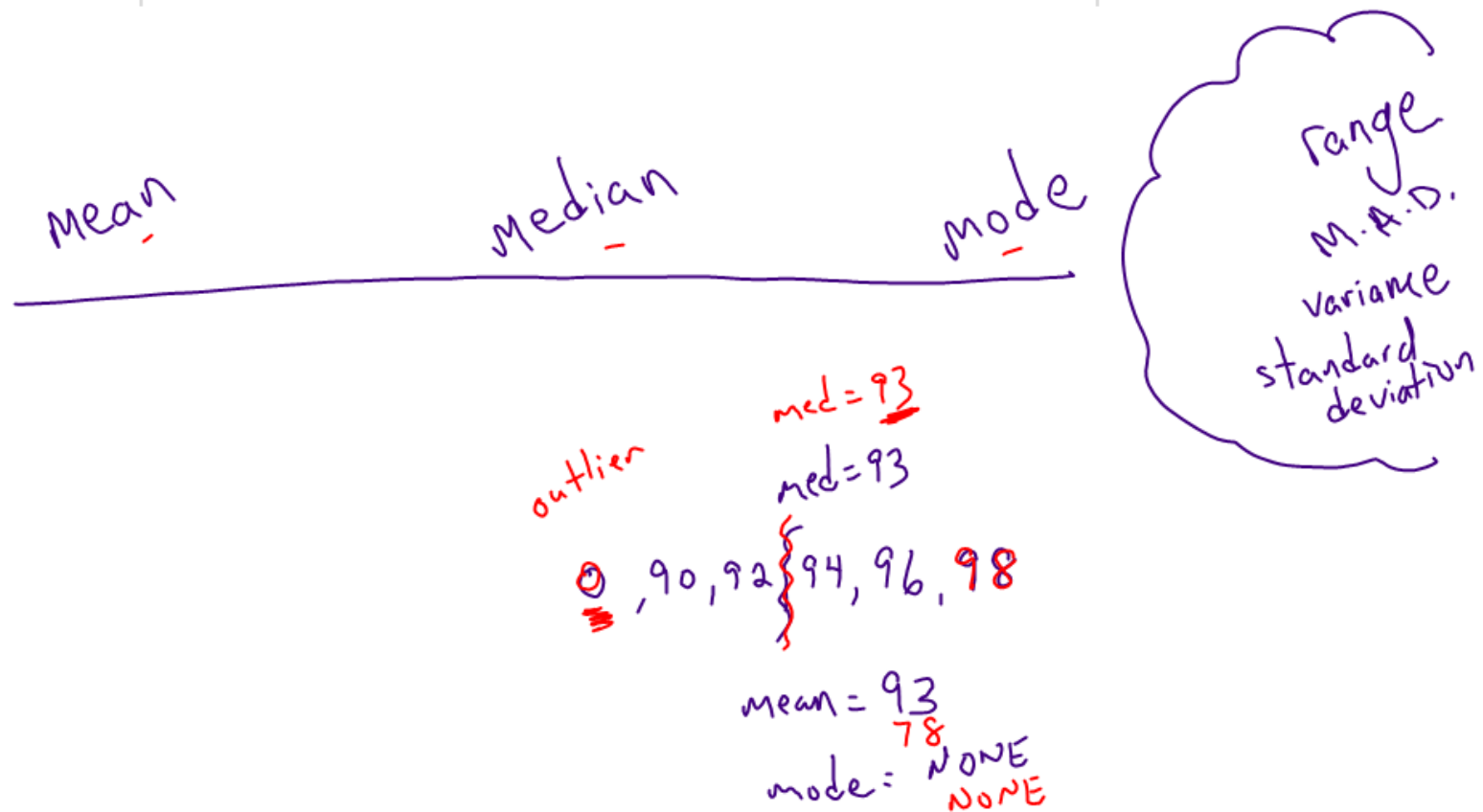


Measures of Central Tendency

Objectives

Find measures of central tendency.



Mean, Median and Mode

measures
of
central
tendency

measure
of
dispersion
(spread)

- The mean is the average (the sum of the values in the set divided by the number of values). It is often represented as \bar{x} . $\bar{x} = x\text{-bar}$
- The median is the *middle value* or, whenever there is an even number of values in the set, the mean of the two middle values when the set is ordered numerically.
- The mode is the *value or values that occur most often*. A data set may have one, none, or several modes.
- The range is the *difference* between the largest value and the smallest value in a set. It is a measure that reveals the dispersion of the data in a set.

Example 1: Finding Measures of Central Tendency

Find the mean, median, and mode of the data.

deer at a feeder each hour: 3, ~~0~~, ~~2~~, ~~0~~, ~~1~~, ~~2~~, 4

0, 0, 1, 2, 2, 3, 4

$$\text{sum} = 12$$

$$n = 7$$

↳ # of data values

$$\text{mean} = 12/7 = 1.71$$

$$\text{median} = 2$$

$$\text{mode} = 0 \text{ \& } 2$$

You Try! Example 2

Find the mean, median, and mode of the data set.

{6, 9, 3, 8}

3, 6, 8, 9
}
}

$$\text{sum} = 26$$

$$n = 4$$

$$\text{mean} = 26/4 = 6.5$$

$$\text{median} = 7$$

$$\text{mode} = \text{N/A}$$

Find the mean, median, and mode of the data set. {2,5,6,2,6}

2, 2, 5, 6, 6

Mean: $21/5 = \underline{\underline{4.2}}$

Mode: $\underline{\underline{2 \ \& \ 6}}$

Median: $\underline{\underline{5}}$

Range: $6 - 2 = \underline{\underline{4}}$

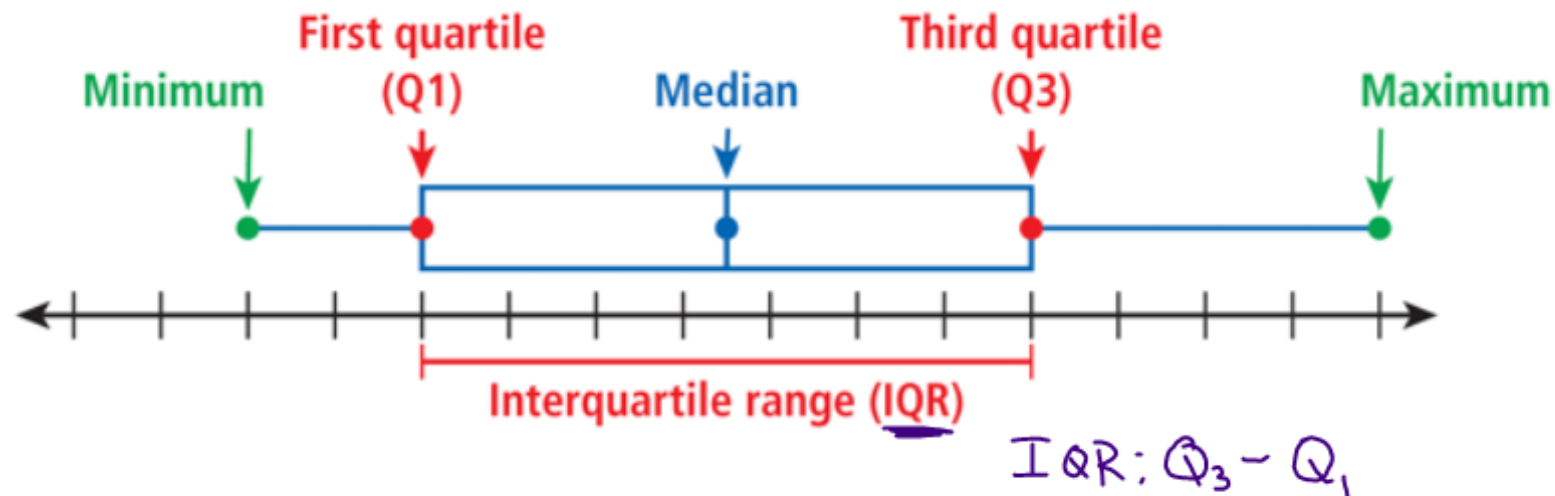
Box-and-Whisker Plot

A *box-and-whisker plot* shows the spread of a data set. It displays 5 key points: the

min. and max values, the median (50%),
the 1st Quartile (Q1 = 25%) & 3rd Quartile (Q3 = 75%).

5 number summary

A *box-and-whisker plot* shows the spread of a data set. It displays 5 key points: the **minimum** and **maximum** values, the **median**, and the **first** and **third quartiles**.

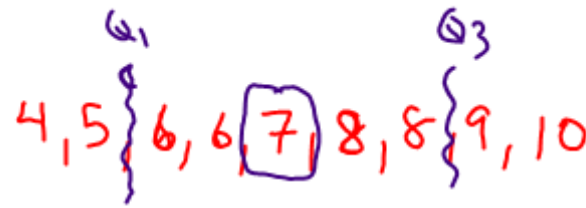


Range: $max - min$

The quartiles are the medians of the lower and upper halves of the data set. If there are an odd number of data values, do not include the median in either half.

The *interquartile range*, or IQR, is the difference between the 1st and 3rd quartiles, or $Q3 - Q1$. It represents the middle 50% of the data.

Example 3:



Min = 4

med = 7

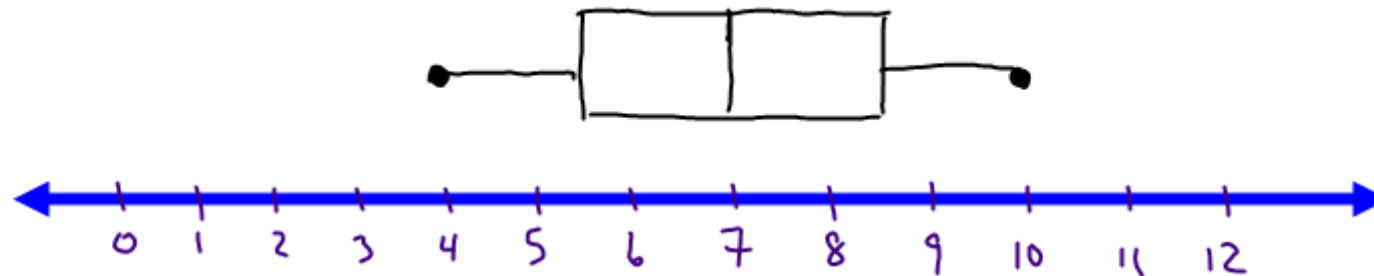
$Q_1 = 5.5$

$Q_3 = 8.5$

Max = 10

Make a box-and-whisker plot of the data. Find the interquartile range.

~~{6, 8, 7, 5, 10, 6, 9, 8, 4}~~



Symmetrical

You Try! Example 4

Make a box-and-whisker plot of the data. Find the interquartile range. ~~{13, 14, 18, 13, 12, 17, 15, 12, 13, 19, 11, 14, 14, 18, 22, 23}~~

11, 12, 12, 13 } 13, 13, 14, 14 } 14, 15, 17, 18 } 18, 19, 22, 23
 Q_1 Q_3

$$\text{min} = 11$$

$$Q_1 = 13$$

$$\text{med} = 14$$

$$Q_3 = 18$$

$$\text{Max} = 23$$

skewed right

