

MEASURES OF CENTRAL TENDENCY + VARIATION

Measures of Central Tendency — find the "center" of the data

Mean = $\frac{\sum x}{n}$

\bar{x} = sample mean
 μ = population mean

x = data
 n = # of items
 Σ = sum

Median — the middle value

most affected by extreme values

75 pieces of data $\frac{75}{2} = 37.5 \Rightarrow$ 38th

120 pieces of data = $\frac{120}{2} = 60$ — 60th & 61st

Data must be in order!

$\frac{n}{2}$


Mode — most frequent value — can be up to 3 numbers as mode



MEASURES OF VARIATION - Show the "Spread" of the data

Range = Highest Value - Lowest Value SS 73 - 102
 * Most affected by an extreme value

Interquartile Range (IQR) = $Q_3 - Q_1$
 ↳ Range of the middle 50% of the data



Standard Deviation - Sample st. dev. = s
 population st. dev. = σ

the "average" of how much each piece of data varies from the mean.

{7, 13, 16, 17, 19, 24}

$$\bar{x} = \frac{96}{6} = 16$$

$$(-9)^2 + (-3)^2 + (0)^2 + (1)^2 + (3)^2 + (8)^2 = \frac{164}{6}$$

$$= \sqrt{27.33} \approx 5.23$$

1) Find mean.

2) Data - mean

3) Square the differences

4) Find mean of the squares

5) Square root of mean.

$$\sigma = \sqrt{\frac{\sum (x - \mu)^2}{n}}$$

$$s = \sqrt{\frac{\sum (x - u)^2}{n - 1}}$$

4	2
5	8
6	1 1 8 9
7	2 1 1 5 6 8 9
8	2 2 2 6 8
9	1 4 8 9

$4 | 2 = 42\%$
22 students

$IQR = 86 - 69 = 17$

- 1) $17 * 1.5 = 25.5$
- 2) $69 - 25.5 = 43.5$
- 3) $86 + 25.5 = 111.5$

Outlier: 42



$Med = \frac{22}{2} = 11^{th} + 12^{th}$
 $= \frac{76 + 78}{2} = 77$

$Q_1 + Q_3 = \frac{11}{2} = 5.5 = 6^{th}$

$Q_1 = 69 \quad Q_3 = 86$

Outliers

- 1) $IQR * 1.5 = \#$
- 2) $Q_1 - \# = \text{lower boundary}$
- 3) $Q_3 + \# = \text{upper boundary}$

