

STA2023: Test 1 Formulas

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Variance:

$$\sigma^2 = \frac{\sum(x - \mu)^2}{n} \quad s^2 = \frac{\sum(x - \bar{x})^2}{n - 1} \quad \sigma^2 = \frac{n \sum x^2 - (\sum x)^2}{n^2} \quad s^2 = \frac{n \sum x^2 - (\sum x)^2}{n(n - 1)}$$

Standard deviation:

$$\sigma = \sqrt{\frac{\sum(x - \mu)^2}{n}} \quad s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}} \quad \sigma = \sqrt{\frac{n \sum x^2 - (\sum x)^2}{n^2}} \quad s = \sqrt{\frac{n \sum x^2 - (\sum x)^2}{n(n - 1)}}$$

Range = max – min

$$\text{Midrange} = \frac{\text{max} + \text{min}}{2}$$

Standard Deviation rule of thumb $\approx \frac{\text{Range}}{4}$

Coefficient of Variation, CV = $\frac{s}{\bar{x}} \cdot 100$

Interquartile range, IQR:

$$\text{IQR} = Q_3 - Q_1$$

Rule to determine outliers:

A data value is an outlier if it is greater than $Q_3 + 1.5 \cdot \text{IQR}$ or less than $Q_1 - 1.5 \cdot \text{IQR}$

$$\text{Z score} = \frac{x - \mu}{\sigma}$$

Solving for x on the Z score formula: $x = z \cdot \sigma + \mu$