

STA2023: Additional set of Formulas

[@imathesis.com](http://imathesis.com)

$$\text{Range} = \max - \min$$

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

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

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

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 $Q_1 - 1.5 \cdot \text{IQR}$

Discrete Probability distributions:

$$\mu = \sum x \cdot p(x) \qquad \sigma^2 = \sum x^2 p(x) - \mu^2$$

Binomial Distribution:

$$p(x) = {}_n C_x \cdot p^x \cdot q^{n-x}$$

$$\mu = n \cdot p \qquad \sigma^2 = n \cdot p \cdot q$$

Rule of thumb for significant values:

Significantly low values $< \min = \mu - 2\sigma$

Significantly high values $> \max = \mu + 2\sigma$

Usual values: $\min \leq x \leq \max$

Z score = $\frac{x - \mu}{\sigma}$; alternatively: Z score = $\frac{x - \mu}{\sigma/\sqrt{n}}$ By Central Limit Theorem

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