Variance

Numerical Descriptive Measures for a Population: The mean μ

- The population mean is the sum of the values in the population divided by the population size, N

$$\mu = \frac{\sum_{i=1}^{N} X_i}{N} = \frac{X_1 + X_2 + \cdots + X_N}{N}$$

Where μ = ***population mean (mu)***

N = population size

X_i = i^{th} value of the variable X

Remember

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

= sample mean

Measures of Variation: The Variance

- **Sample variance**:

$$S^2 = \frac{\sum_{i=1}^{n} (X_i - \bar{X})^2}{n-1}$$

Where $\bar{X}$ = mean

n = sample size

X_i = i^{th} value of the variable X

Numerical Descriptive Measures For A Population: The Variance σ^2

- Average of squared deviations of values from the mean
  - Population variance:

$$\sigma^2 = \frac{\sum_{i=1}^{N}(X_i - \mu)^2}{N}$$

Where μ = population mean

N = population size

X_i = i^{th} value of the variable X