STUDENT SUCCESS CENTER
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

KEY FORMULAS FOR BUSINESS STATS I

Percentile:

- $\frac{P}{100(N+1)}$
- Used to determine the nth percentile

Variance:

- Population: $\sigma^2 = \frac{\sum(X-\mu)^2}{N}$
- Sample: $s^2 = \frac{\sum(x-\underline{X})^2}{n-1}$
- Used to determine how dispersed the data set is from the mean

Standard Deviation:

- Population: $\sigma = \sqrt{\frac{\sum_{i=1}^{N}(x_i-\mu)^2}{N}}$
- Sample: $s = \sqrt{\frac{\sum_{i=1}^{n}(x_i-\bar{x})^2}{n-1}}$
- Used to determine the degree of variation of a data set

Coefficient of Variation:

- CV = $\frac{S}{\bar{x}}$
- Ratio between mean and standard deviation

Covariance:

- Population: $Cov(x,y) = \frac{\sum(Xi-\underline{x})*(yi-\underline{y})}{N}$
- Sample: $Cov(x,y) = \frac{\sum(Xi-\underline{x})*(yi-\underline{y})}{(N-1)}$
- Used to measure variability between two variables

Correlation Coefficient:

- Population: $\rho = \frac{Cov\,(x,y)}{\sigma x \sigma y}$
- Sample: R = $R_{xy} = \frac{Cov(x,y)}{Sx*Sy}$
- Used when determining how good of a fit a linear equation is to a set of data

Probability Combinations:

- $C(n,r) = \frac{n!}{r!(n-r)!}$
- Used when determining how many combinations are possible when order doesn't matter

Binomial Probability Distribution:

- $P(X) = {}_nC_x p^x (1-p)^{n-x}$
- Used when determining the probability of an event that either succeeds or fails

Hypergeometric Probability Distribution:

- $p(x) = \frac{|r\ x\ ||N-r\ n-x\ |}{|N\ n\ |}$
- Used when something is being pulled from the pool without replacement

Uniform Probability Distribution:

- $\frac{1}{b-a}$
- Used when the probabilities of each event are equally likely

Exponential Probability Distribution:

- $F(x) = 1 - e^{-x/\beta}\ \ \beta = \mu$
- Used when determining the probability that a task will take a certain amount of time

Normal Probability Distribution:

- $z = \frac{x-\mu}{\sigma}$
- Used when converting random variables to Z-values

For more information, visit a tutor. All appointments are available in-person at the Student Success Center, located in the Library, or online. Adapted from Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2018). *Statistics for Business & Economics* (13th Edition). Boston, MA: Cengage Learning.