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Statistics Notation

1- Capitalization

- P refers to a population proportion; and p , to a sample proportion.\
- X refers to a set of population elements; and x , to a set of sample elements.\
- N refers to population size; and n , to sample size.

2- Population Parameters

- μ refers to a population mean.
- σ refers to the standard deviation of a population.
- σ^2 refers to the variance of a population.
- P refers to the proportion of population elements that have a particular attribute.
- Q refers to the proportion of population elements that do not have a particular attribute, so $Q = 1 - P$.
- ρ is the population correlation coefficient, based on all of the elements from a population.
- N is the number of elements in a population

3- Sample Statistics

- \bar{x} refers to a sample mean.
- s refers to the standard deviation of a sample.
- s^2 refers to the variance of a sample.
- p refers to the proportion of sample elements that have a particular attribute.
- q refers to the proportion of sample elements that do not have a particular attribute, so $q = 1 - p$.
- r is the sample correlation coefficient, based on all of the elements from a sample.
- n is the number of elements in a sample

4- Simple Linear Regression

- B_0 is the intercept constant in a population regression line.
- B_1 is the regression coefficient (i.e., slope) in a population regression line.

- R^2 refers to the coefficient of determination.
- b_0 is the intercept constant in a sample regression line.
- b_1 refers to the regression coefficient in a sample regression line (i.e., the slope).
- sb_1 refers to the standard error of the slope of a regression line

5- Probability

- $P(A)$ refers to the probability that event A will occur.
- $P(A|B)$ refers to the conditional probability that event A occurs, given that event B has occurred.
- $P(A')$ refers to the probability of the complement of event A.
- $P(A \cap B)$ refers to the probability of the intersection of events A and B.
- $P(A \cup B)$ refers to the probability of the union of events A and B.
- $E(X)$ refers to the expected value of random variable X.
- $b(x; n, P)$ refers to binomial probability.
- $b^*(x; n, P)$ refers to negative binomial probability.
- $g(x; P)$ refers to geometric probability.
- $h(x; N, n, k)$ refers to hypergeometric probability.

6- Counting

- $n!$ refers to the factorial value of n.
- nPr refers to the number of permutations of n things taken r at a time.
- nCr refers to the number of combinations of n things taken r at a time. ## 7- Set Theory
- $A \cap B$ refers to the intersection of events A and B.
- $A \cup B$ refers to the union of events A and B.
- $\{A, B, C\}$ refers to the set of elements consisting of A, B, and C.
- $\{\emptyset\}$ refers to the null set. ## 8- Hypothesis Testing
- H_0 refers to a null hypothesis.
- H_1 or H_a refers to an alternative hypothesis.
- α refers to the significance level.
- β refers to the probability of committing a Type II error. ## 9- Random Variables
- Z or z refers to a standardized score, also known as a z-score.
- z_α refers to the standardized score that has a cumulative probability equal to $1 - \alpha$.
- t_α refers to the t statistic that has a cumulative probability equal to $1 - \alpha$.
- f_α refers to a f statistic that has a cumulative probability equal to $1 - \alpha$.
- $f_\alpha(v_1, v_2)$ is a f statistic with a cumulative probability of $1 - \alpha$, and v_1 and v_2 degrees of freedom.
- χ^2 refers to a chi-square statistic. ## 10- Special Symbols Throughout the site, certain symbols have special meanings. For example,
- Σ is the summation symbol, used to compute sums over a range of values.

- Σx or Σx_i refers to the sum of a set of n observations. Thus, $\Sigma x_i = \Sigma x = x_1 + x_2 + \dots + x_n$.
- sqrt refers to the square root function. Thus, $\text{sqrt}(4) = 2$ and $\text{sqrt}(25) = 5$.
- $\text{Var}(X)$ refers to the variance of the random variable X .
- $\text{SD}(X)$ refers to the standard deviation of the random variable X .
- SE refers to the standard error of a statistic.
- ME refers to the margin of error.
- DF refers to the degrees of freedom.