Glossary

1. **Alternative Hypothesis**
   The alternative hypothesis, H_1, is a statement of what a statistical hypothesis test is set up to establish. For example, in a clinical trial of a new drug, the alternative hypothesis might be that the new drug has a different effect, on average, compared to that of the current drug.

2. **Composite hypothesis**
   A composite hypothesis is a hypothesis which does not specify the population distribution completely.

3. **Likelihood Function**
   In statistics, a likelihood function (often simply the likelihood) is a function of the parameters of a statistical model, defined as follows: the likelihood of a set of parameter values given some observed outcomes is equal to the probability of those observed outcomes given those parameter values.

4. **Likelihood Ratio Test**
   A likelihood ratio test is a statistical test used to compare the fit of two models, one of which (the null model) is a special case of the other (the alternative model).

5. **Maximum likelihood estimation**
   Maximum-likelihood estimation (MLE) is a method of estimating the parameters of a statistical model. When applied to a data set and given a statistical model, maximum-likelihood estimation provides estimates for the model's parameters

6. **Mean**
   For a data set, the arithmetic mean is equal to the sum of the values divided by the number of values. The arithmetic mean of a set of numbers x_1, x_2, ..., x_n is typically denoted by x bar. If the data set were based on a series of observations obtained by sampling from a statistical population, the arithmetic mean is termed the sample mean x barto distinguish it from the population mean mu or mu x.

7. **Modulus**
   In mathematics, the absolute value (or modulus) | a | of a real number a is the numerical value of a without regard to its sign. So, for example, the absolute value of 3 is 3, and the absolute value of –3 is also 3. The absolute value of a number may be thought of as its distance from zero.

8. **Normal distribution**
   In probability theory, the normal (or Gaussian) distribution is a continuous probability distribution that has a bell-shaped probability density function, known as the Gaussian function or informally as the bell curve.
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9. **Null Hypothesis**
   The null hypothesis, H_0, represents a theory that has been put forward, either because it is believed to be true or because it is to be used as a basis for argument, but has not

been proved. For example, in a clinical trial of a new drug, the null hypothesis might be that the new drug is no better, on average, than the current drug.

10. One-Tailed Test

A test of a statistical hypothesis, where the region of rejection is on only one side of the sampling distribution, is called a one-tailed test.

11. Parameter Space

A parameter space is the set of all possible combinations of values for all the different parameters contained in a particular model. Parameter spaces are particularly useful for describing families of probability distributions that depend on parameters.

12. Sigma

∑ "sigma" = summation. This is upper-case sigma. Lower-case sigma σ means standard deviation of a population. The order of operations, such as $\sum x^2$ as opposed to $(\sum x)^2$ should be given careful consideration.

13. Summation

Summation is the operation of adding a sequence of numbers; the result is their sum or total. It is frequently necessary in statistical and psychometric calculations to take the sum of a number of values. The symbol used to indicate this operation of adding up a group of numbers is a capital Greek Sigma - Σ

14. Supremum

The supremum (sup) of a subset S of a totally or partially ordered set T is the least element of T that is greater than or equal to all elements of S. Consequently, the supremum is also referred to as the least upper bound (lub or LUB).

15. Variance

Variance is a measure of how far a set of numbers is spread out. It is one of several descriptors of a probability distribution, describing how far the numbers lie from the mean (expected value).