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. **Chi square distribution**

   The chi-squared distribution (also chi-square or χ^2-distribution) with k degrees of freedom is the distribution of a sum of the squares of k independent standard normal random variables. It is one of the most widely used probability distributions in inferential statistics, e.g., in hypothesis testing or in construction of confidence intervals.

4. **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.

5. **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).

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 bar) to 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. **Simple hypothesis**

    A simple hypothesis is a hypothesis which specifies the population distribution.

13. **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).

14. **Two-Tailed Test**

    A two-tailed test is a hypothesis test in which the null hypothesis is rejected if the observed sample statistic is more extreme than the critical value in either direction (higher than the positive critical value or lower than the negative critical value). A two-tailed test this has two critical regions.

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).