<u>Glossary</u>

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. Central Limit Theorem

In probability theory, the central limit theorem (CLT) states that, given certain conditions, the mean of a sufficiently large number of independent random variables, each with finite mean and variance, will be approximately normally distributed. The central limit theorem has a number of variants. In its common form, the random variables must be identically distributed. In variants, convergence of the mean to the normal distribution also occurs for non-identical distributions, given that they comply with certain conditions.

3. Critical Value

The critical value in a hypothesis test is the value of the test statistic beyond which we would reject the null hypothesis. The critical value is set so that the probability that the test statistic is beyond the critical value is at most equal to the significance level if the null hypothesis be true.

4. 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)

5. 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.

6. 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.

7. 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.

8. Probability distribution

Probability distribution is a function that gives the probability of all elements in a given space.

9. Region of rejection

The range of values that leads the researcher to reject the null hypothesis is called the region of rejection.

10. Test Statistic

In hypothesis testing, a hypothesis test is typically specified in terms of a test statistic, which is a function of the sample. It is as a numerical summary of a set of data that reduces the data to one or a small number of values that can be used to perform a hypothesis test.

11. 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.

12. Type I Error

In a hypothesis test, a type I error occurs when the null hypothesis is rejected when it is in fact true; that is, H_0 is wrongly rejected.

13. Significance level

The significance level of a statistical hypothesis test is a fixed probability of wrongly rejecting the null hypothesis H_0 , if it is in fact true.

14. Standard deviation

This is the most commonly used measure of statistical dispersion. It is the square root of the variance, and is generally written as sigma.

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).