<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. Composite hypothesis

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

3. Lemma

Lemma is a proven statement used as a stepping-stone toward the proof of another statement.

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. Most Powerful Critical Region

Among the critical regions of the same size α that which renders the minimum Type two error is called the most powerful critical region.

6. 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.

7. 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.

8. Power

The power of a statistical hypothesis test measures the test's ability to reject the null hypothesis when it is actually false - that is, to make a correct decision. In other words, the power of a hypothesis test is the probability of not committing a type II error. It is calculated by subtracting the probability of a type II error from 1, usually expressed as:

Power = 1 - P (type II error) = $(1 - \beta)$

9. Powerful Test

The test based on the most powerful critical region is called the most powerful test.

10. 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.

11. Simple hypothesis

A simple hypothesis is a hypothesis which specifies the population distribution

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. Type II Error

In a hypothesis test, a type II error occurs when the null hypothesis H_0 , is not rejected when it is in fact false.

14. Unbiased Critical Region

A critical region whose power is more than its size is called unbiased critical region.

15. Unbiased test

The test procedure for which the power is more than its size is called an unbiased test.