Statistical test types

the choice of statistical test depends on the type of data being analyzed and the research question being asked. It is important to choose the appropriate test to ensure accurate and meaningful results.

The choice of which statistical test to utilize relies upon the structure of data, the distribution of the data, and variable type.

1.t-test : used to compare the means of two groups and determine if they are significantly different from each other. The t-test assumes that the data is normally distributed and that the variances of the two groups are equal.

1. Independent samples t-test: The independent samples t-test is used to compare the means of two independent groups. For example, it could be used to compare the mean test scores of students who received a new teaching method versus those who did not.

2. Paired samples t-test: The paired samples t-test is used to compare the means of two related groups. For example, it could be used to compare the mean weight of individuals before and after they participated in a weight loss program.

2.chi-square :

used to determine if there is a significant association between two categorical variables. It is often used in studies where the data is in the form of counts or frequencies. The chi-square test compares the observed frequencies of each category with the expected frequencies, assuming that there is no association between the two variables. The expected frequencies are calculated based on the assumption of independence between the two variables. The chi-square test can be used with different types of categorical data, including nominal data and ordinal data. It can also be used with contingency tables

3.z-test :

is used to determine whether the mean of a sample is significantly different from a known population mean when the population standard deviation is known. The z-test assumes that the data is normally distributed and that the sample is drawn from a population that has a known standard deviation.

4.anova test :

used to compare the means of three or more groups and determine if there are significant differences among them. The ANOVA test is based on the assumption that the data is normally distributed and that the variances of the groups being compared are equal. It is widely used in research and can be applied to a wide range of fields, including psychology, medicine, and business

5. F-test is a statistical test used to compare the variances of two populations or the overall variance of multiple populations. It is named after its distribution, the F-distribution, which is a probability distribution that arises from the ratio of two independent chi-square distributions. The F-test is sensitive to deviations from normality and can be affected by outliers.