**T-Test:**

A t-test is a statistical test used to compare the means of two groups to determine if they are significantly different from each other. It is commonly used when the sample size is small, and the population standard deviation is unknown. Two-Sample T-Test: Null Hypothesis (H0): There is no significant difference between the means of the two groups. Hypothesis (H1): There is a significant difference between the means of the two groups. Test Statistic: t-statistic, which measures how many standard errors the sample mean is from the population mean. P-Value: The probability of obtaining a t-statistic as extreme as the one calculated from the sample data, assuming the null hypothesis is true.

**Z-Test:**

A z-test is used to determine if there is a significant difference between a sample mean and a known population mean. It is often employed when the sample size is large, and the population standard deviation is known. Z-Test: Null Hypothesis (H0): There is no significant difference between the sample mean and the population mean. Alternative Hypothesis (H1): There is a significant difference between the sample mean and the population mean. Test Statistic: z-statistic, which measures how many standard deviations the sample mean is from the population mean. P-Value: The probability of obtaining a z-statistic as extreme as the one calculated from the sample data, assuming the null hypothesis is true.

**P-Test:**

A p-test is essentially a one-sample t-test that compares a sample mean to a known population mean. It's commonly used to assess whether a sample comes from a population with a specific mean. One-Sample T-Test (P-Test): Null Hypothesis (H0): There is no significant difference between the sample mean and the population mean (usually 0 in a P-test). Alternative Hypothesis (H1): There is a significant difference between the sample mean and the population mean. Test Statistic: t-statistic, measuring how many standard errors the sample mean is from the assumed population mean. P-Value: The probability of obtaining a t-statistic as extreme as the one calculated from the sample data, assuming the null hypothesis is true. These tests help researchers and analysts make informed decisions about whether observed differences are likely due to random chance or if they reflect true population differences. Adjusting the significance level (alpha) allows for controlling the rate of Type I errors (false positives).

