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1. **What is Hypothesis Testing?**

A statistical hypothesis, sometimes called confirmatory data analysis, is a hypothesis that is testable on the basis of observing a process that is modeled via a set of random variables. A statistical hypothesis test is a method of statistical inference.

A hypothesis is a theory or proposition set forth as an explanation for the occurrence of some observed phenomenon, asserted either as a provisional conjecture to guide investigation, called a working hypothesis, or accepted as highly probable in lieu of the established facts. A scientific hypothesis can become a theory or ultimately a law of nature if it is proven by repeatable experiments. Hypothesis testing is common in statistics as a method of making decisions using data. In other words, testing a hypothesis is trying to determine if your observation of some phenomenon is likely to have really occurred based on statistics.

1. **Differentiate between P-Value Approach and Classical Methods of hypothesis testing?**

The P-Value Approach, short for Probability Value, approaches hypothesis testing from a different manner. Instead of comparing z-scores or t-scores as in the classical approach, you're comparing probabilities, or areas.

The level of significance (alpha) is the area in the critical region. That is, the area in the tails to the right or left of the critical values.

The p-value is the area to the right or left of the test statistic. If it is a two tail test, then look up the probability in one tail and double it.

If the test statistic is in the critical region, then the p-value will be less than the level of significance. It does not matter whether it is a left tail, right tail, or two tail tests. This rule always holds.

1. **What is the importance of hypothesis testing?**

Hypothesis testing is one of the most important concepts in statistics because it is how you decide if something really happened, or if certain treatments have positive effects, or if groups differ from each other or if one variable predicts another. In short, you want to proof if your data is statistically significant and unlikely to have occurred by chance alone. In essence then, a hypothesis test is a test of significance.