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Assignment

1. What do you understand by hypothesis testing?
2. Differentiate between the classical and p-value approach for hypothesis testing?
3. What is the importance of hypothesis testing in research?

Answers

1. Hypothesis testing is an act in statistics whereby an analyst tests an assumption regarding a population parameter. The methodology employed by the analyst depends on the nature of the data used and the reason for the analysis.

Four Steps of Hypothesis Testing

All hypotheses are tested using a four-step process:

- The first step is for the analyst to state the two hypotheses so that only one can be right.
- The next step is to formulate an analysis plan, which outlines how the data will be evaluated.

- The third step is to carry out the plan and physically analyze the sample data.
- The fourth and final step is to analyze the results and either reject the null hypothesis, or state that the null hypothesis is plausible, given the data.

Real-World Example of Hypothesis Testing

If, for example, a person wants to test that a penny has exactly a 50% chance of landing on heads, the null hypothesis would be yes, and the alternative hypothesis would be no (it does not land on heads).

Mathematically, the null hypothesis would be represented as $H_0: P = 0.5$.

The alternative hypothesis would be denoted as " H_a " and be identical to the null hypothesis, except with the equal sign struck-through, meaning that it does not equal 50%.

2. In the classical approach: The first approach of hypothesis testing is a classical test statistic approach, which computes a test statistic from the empirical data and then makes a comparison with the critical value. If the test statistic in this classical approach is larger than the critical value, then the null hypothesis is rejected. Otherwise, it is accepted. While for the p-value the probability of obtaining results as extreme as the observed results of a statistical hypothesis test, assuming that the null hypothesis is correct. The p-value is used as an alternative to rejection points to

provide the smallest level of significance at which the null hypothesis would be rejected.

3. Importance of hypothesis testing

3. The purpose of hypothesis testing is to assist administrators, clinicians, researchers to make wise decisions which usually depends on statistical decisions. Statistical hypothesis testing can be also called confirmatory data analysis, because it can often be used to decide whether experimental results contain enough information to cast doubt on conventional wisdom.