Hypothesis Testing

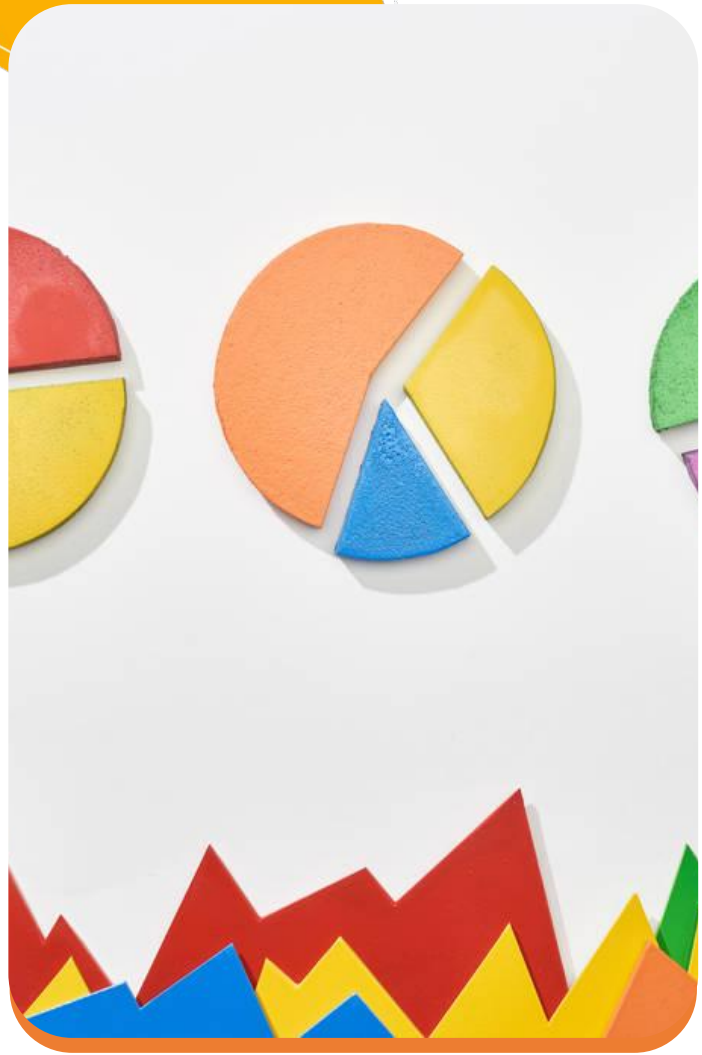
This lesson provides an overview of hypothesis testing and its importance in statistical analysis.

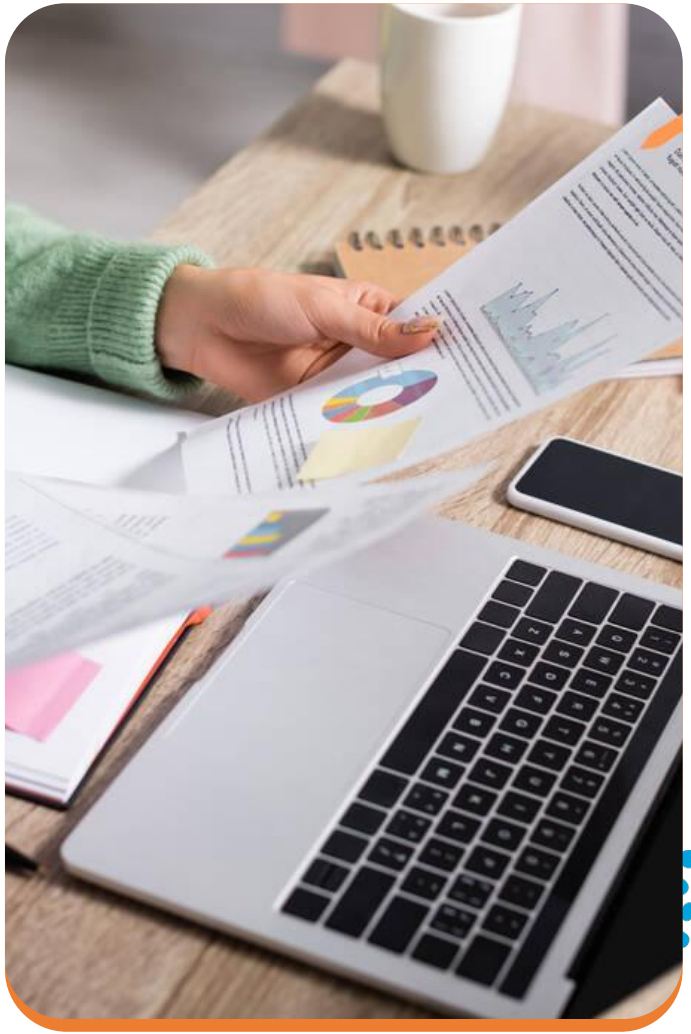
Introduction to Hypothesis Testing

01 The primary goal is to determine whether there is enough evidence from the sample data to support or reject a specified statement about the population.

02 Hypothesis testing is a statistical method used to make decisions or infer conclusions about a population based on sample data.

03 It involves testing an assumption (hypothesis) about a parameter of a population.





Key Reasons for Performing Hypothesis Testing

- **Decision Making:** It provides a systematic way to make decisions about a population parameter based on sample data.
- **Assessing Evidence:** Hypothesis testing helps in assessing the strength of evidence against the null hypothesis.
- **Comparing Groups:** It enables statistically valid comparisons between two or more groups.
- **Investigating Relationships:** Hypothesis testing is used to investigate relationships between variables.
- **Establishing Causality:** It is essential for establishing causality in experimental designs.

Steps in Hypothesis Testing

- Formulate Hypotheses
- Choose a Significance Level
- Select the Appropriate Test Statistic
- Calculate the Test Statistic and P Value
- Make a Decision
- Provide a Conclusion

Formulating Hypotheses

- Identify the purpose of conducting a statistical test
- Assign the purposes into two categories: Null Hypothesis (H0) and Alternative Hypothesis (Ha/H1)
- **Null Hypothesis:** States that there is no difference, no effect, or nothing can be proved statistically.
- **Alternative Hypothesis:** States that there is a significant difference, effect, or enough evidence that can be proved statistically.

Scenario Example: Testing a New Medication

01 Background: A pharmaceutical company has developed a new medication intended to lower blood pressure more effectively than the current standard treatment.

02 **Null Hypothesis:** The mean decrease in blood pressure by the new medication is equal to the mean decrease in blood pressure by the current standard treatment.

03 **Alternative Hypothesis:** The mean decrease in blood pressure by the new medication is greater than the mean decrease in blood pressure by the current standard treatment.

Thank you for your time and attention 🙂