Measures of Descriptive and Inferential Statistics

This lesson provides an overview of measures of descriptive and inferential statistics, including their definitions, purposes, and scenarios for use.

A Recap on Descriptive Statistics

- **Mean:** The average of all data points
- **Median:** The middle value in a data set
- **Mode:** The most frequently occurring value(s)
- **Range:** The difference between the highest and lowest values
- **Variance:** A measure of how much the values differ from the mean
- **Standard Deviation:** The average distance of each data point from the mean
- **Interquartile Range (IQR):** The difference between the 75th and 25th percentiles
- **Skewness:** A measure of the asymmetry of the distribution
- **Kurtosis:** A measure of the 'tailedness' of the distribution
- **Percentiles/Quartiles:** Divide the data into equal parts

One Sample T-test

01 When to Use: Compare average score of sample data to a predefined score

02 Definition: Determines if the mean of a sample is significantly different from a known population mean

03 Purpose: Test hypotheses about the mean of a population with unknown standard deviation

04 Scenario Example: Testing the effectiveness of a new diet plan

Independent Sample T-test

- Definition: Compares means of two independent groups
- Purpose: Compare means between unrelated groups on the same variable
- When to Use: Find significant difference on numeric sample data between two groups
- Scenario Example: Comparing the effectiveness of two teaching methods

Paired Sample T-test

01 When to Use: Compare numeric data or average values between two time frames

02 Definition: Compares means of two related groups

03 Purpose: Analyze effects of treatment or intervention on a single group

04 Scenario Example: Analyzing the impact of medication on blood pressure

One-Way Between-Groups ANOVA

01 When to Use: Check differences in average values among multiple independent groups

02 Definition: Compares means of three or more independent groups

03 Purpose: Identify significant differences between means of independent groups

04 Scenario Example: Comparing the effectiveness of different diets

Chi-Square Tests for Independence

01 When to Use: Measure relationship between two categorical data

02 Definition: Determines association between two categorical variables

03 Purpose: Assess relationship or independence between categorical variables

04 Scenario Example: Analyzing association between gender and product preference

Pearson Correlation Test

- Definition: Measures strength and direction of linear relationship between two continuous variables
- Purpose: Quantify degree of linear relationship between variables
- When to Use: Investigate linear relationship between numeric or ordinal variables
- Scenario Example: Exploring relationship between study hours and test scores

Conclusion

01 They identify relationships between variables and predict outcomes

02 Inferential statistical tests are essential for data analysis

03 They enable researchers to draw conclusions about populations from samples

04 By selecting the appropriate test, analysts can provide robust evidence to support their hypotheses

Thank you for your time 😊