

# Mind Map

## Types of Data

- Quantitative Data: Numerical data that can be measured (e.g., age, height).
- Discrete: Whole numbers (e.g., number of students).
- Continuous: Can take any value (e.g., weight, temperature).
- Qualitative (Categorical) Data: Descriptive data (e.g., colors, names).
- Nominal: No specific order (e.g., gender, eye color).
- Ordinal: Ordered categories (e.g., satisfaction levels: low, medium, high).
- Interval Data: Numeric, equal intervals, no true zero (e.g., temperature in  $^{\circ}\text{C}$ ).
- Ratio Data: Numeric, equal intervals, true zero exists (e.g., weight, height).

## Regression Analysis

A statistical technique to study relationships between variables.

- Linear Regression: Predicts a dependent variable based on an independent variable (e.g., predicting sales based on advertising).
- Multiple Regression: Uses two or more independent variables to make predictions.

## Inferential Statistics

A branch of statistics used to make conclusions about a population based on a sample, using methods like hypothesis testing, confidence intervals, and regression analysis.

## Confidence Intervals

A range of values used to estimate a population parameter with a certain level of confidence (e.g., 95% confidence interval means there is a 95% chance the true value lies within the range).

- Higher confidence level  $\rightarrow$  wider interval (less precision).

## Hypothesis Testing

A statistical method to determine if there is enough evidence to reject a null hypothesis ( $H_0$ ) in favor of an alternative hypothesis ( $H_1$ ).

- p-value: The probability of obtaining the observed results if  $H_0$  is true.
- Significance Level ( $\alpha$ ): A threshold (e.g., 0.05) to decide if results are statistically significant.