Mean (Average)

Detailed Study Notes

The mean is one of the most fundamental concepts in statistics. It represents the arithmetic average of a dataset and provides a measure of central tendency.

Definition:
The mean is calculated by summing all values in a dataset and dividing by the number of values.

Formula:
Mean (μ) = $\Sigma x / n$
where Σx is the sum of all values and n is the number of values

Detailed Example:
Consider a dataset of test scores: 10, 20, 30, 40, 50
Step 1: Sum all values: 10 + 20 + 30 + 40 + 50 = 150
Step 2: Count the number of values: n = 5
Step 3: Divide sum by count: Mean = 150 / 5 = 30

Properties of the Mean:
1. The mean is sensitive to outliers (extreme values)
2. The sum of deviations from the mean equals zero
3. The mean minimizes the sum of squared deviations

When to Use the Mean:
- Use the mean when data is symmetrically distributed
- Appropriate for interval and ratio level data
- Best when there are no significant outliers

Limitations:
- Can be misleading with skewed distributions
- Not appropriate for ordinal data
- Heavily influenced by extreme values