# UNIT-II: Descriptive Statistics

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## Classification and Tabulation of Univariate Data

Univariate data consists of observations on a single variable. It can be classified based on characteristics and tabulated in frequency tables for better analysis.

## Graphical Representation

Visualizing data helps in understanding trends and patterns. Common graphical methods include:
- **Histograms**: Used for frequency distribution.
- **Pie Charts**: Represent categorical data proportions.
- **Bar Graphs**: Compare different categories of data.

## Frequency Curves

A frequency curve is a smooth curve representing a distribution of data points. Common types include:
- Normal Curve
- Skewed Curve
- U-shaped Curve

## Descriptive Measures: Central Tendency

Measures of central tendency summarize data into a single value:
- **Mean**: Arithmetic average, given by $\bar{x} = \frac{\sum x}{n}$
- **Median**: Middle value when data is ordered.
- **Mode**: Most frequently occurring value.

## Descriptive Measures: Dispersion

Dispersion measures the spread of data:
- **Range**: Difference between the maximum and minimum value.
- **Variance**: Measures the average squared deviations from the mean.
- **Standard Deviation**: Square root of variance, given by $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$

## Bivariate Data

Bivariate data involves two variables, often analyzed using scatter plots and correlation coefficients.

## Marginal and Conditional Frequency Distribution

- **Marginal Distribution**: The distribution of individual variables.
  - **Conditional Distribution**: The distribution of one variable given another variable’s condition.