



**Course Title: Business Research**

**Course Code: 01ABBAB24412**

**Unit IV - Data Analysis & Interpretation**

**4.1 - Data tabulation.**

**4.2 - Data Analysis.**

**4.3 - Hypothesis Testing.**

**4.4 - Data Interpretation.**

**4.5 - Results & Findings.**

# Data Tabulation



- Tabulation is a systematic and logical representation of numeric data in rows and columns to facilitate comparison and statistical analysis.
- It facilitates comparison by bringing related information close to each other and helps in statistical analysis and interpretation.
- It converts **unorganized data** → **organized statistical form**.

# Data Tabulation- Objectives



- To simplify large volumes of data.
- To make comparison easy.
- To identify patterns and trends.
- To prepare data for statistical testing.
- To improve clarity and logical presentation

# Data Tabulation- Objectives



A statistically proper table contains:

- Table Number
- Title
- Headnote (if required)
- Column headings
- Row headings
- Body (data)
- Total
- Source note (if secondary data)

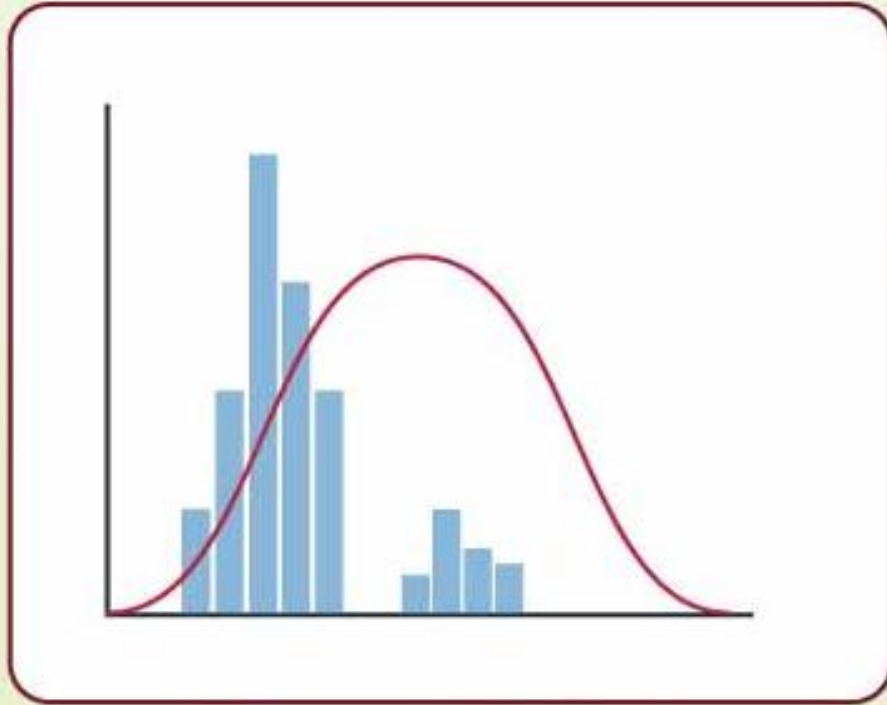
Gender	Frequency	Percentage
Male	120	60%
Female	80	40%

# Data Analysis

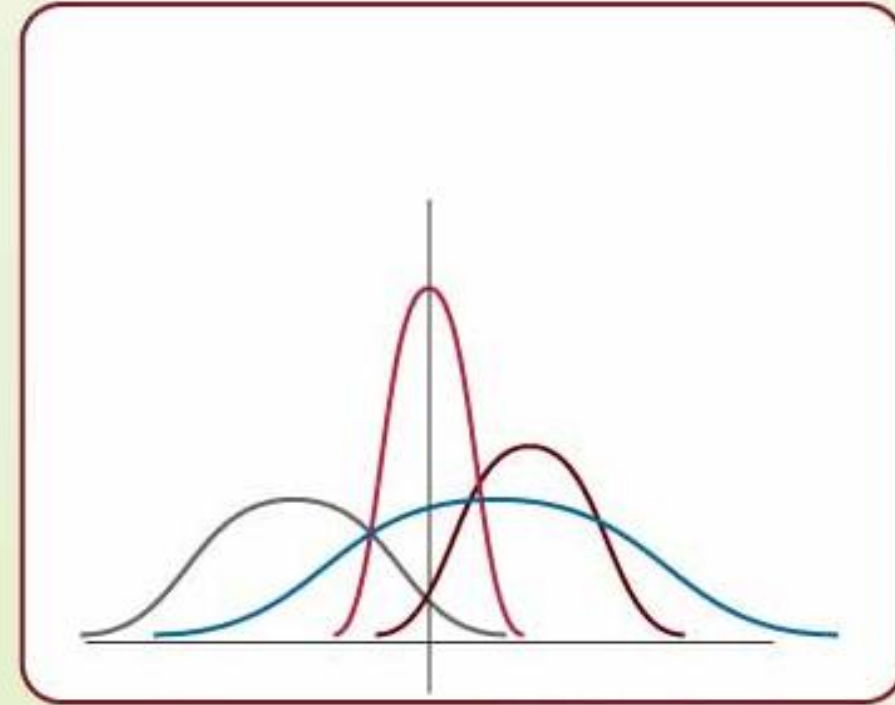


- Data analysis is the process of inspecting, cleaning, transforming, and modeling data to discover useful information, draw conclusions, and support decision-making.
- It involves applying statistical and logical techniques to interpret data and extract meaningful insights.

# Data Analysis



Parametric Test



Non-parametric Test

# Hypothesis testing



- Hypothesis testing is a statistical procedure used to determine whether there is enough evidence in a sample to support a particular claim about a population.
- It helps us decide whether our assumption is true or not based on data.

# Hypothesis testing



## (A) Null Hypothesis

- ( $H_0$ ) States that there is no relationship or no difference. It is the hypothesis we try to test and possibly reject.
- Example:  $H_0$ : There is no significant relationship between service quality and tourist satisfaction.

## (B) Alternative Hypothesis

( $H_1$  /  $H_a$ ) States that there is a relationship or difference.

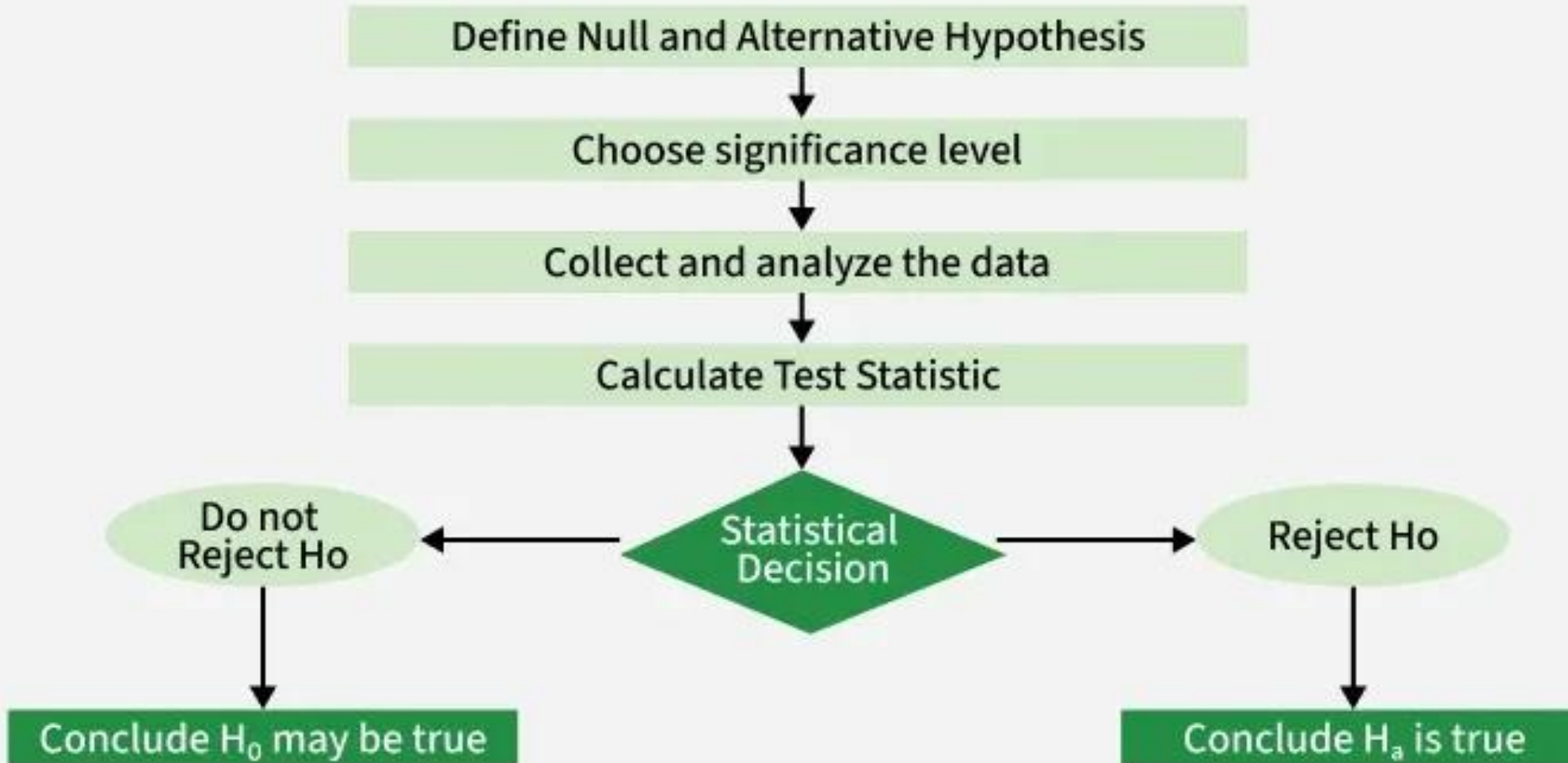
- Example:  $H_1$ : There is a significant relationship between service quality and tourist satisfaction.

# Hypothesis testing



- **State  $H_0$  and  $H_1$**
- **Choose significance level ( $\alpha$ )** – usually 0.05 (5%)
- **Select appropriate statistical test**
  - t-test
  - Chi-square
  - ANOVA
  - Correlation
  - Regression
- **Calculate p-value**
  - If p-value  $< 0.05 \rightarrow$  Reject  $H_0$
  - If p-value  $\geq 0.05 \rightarrow$  Fail to reject  $H_0$

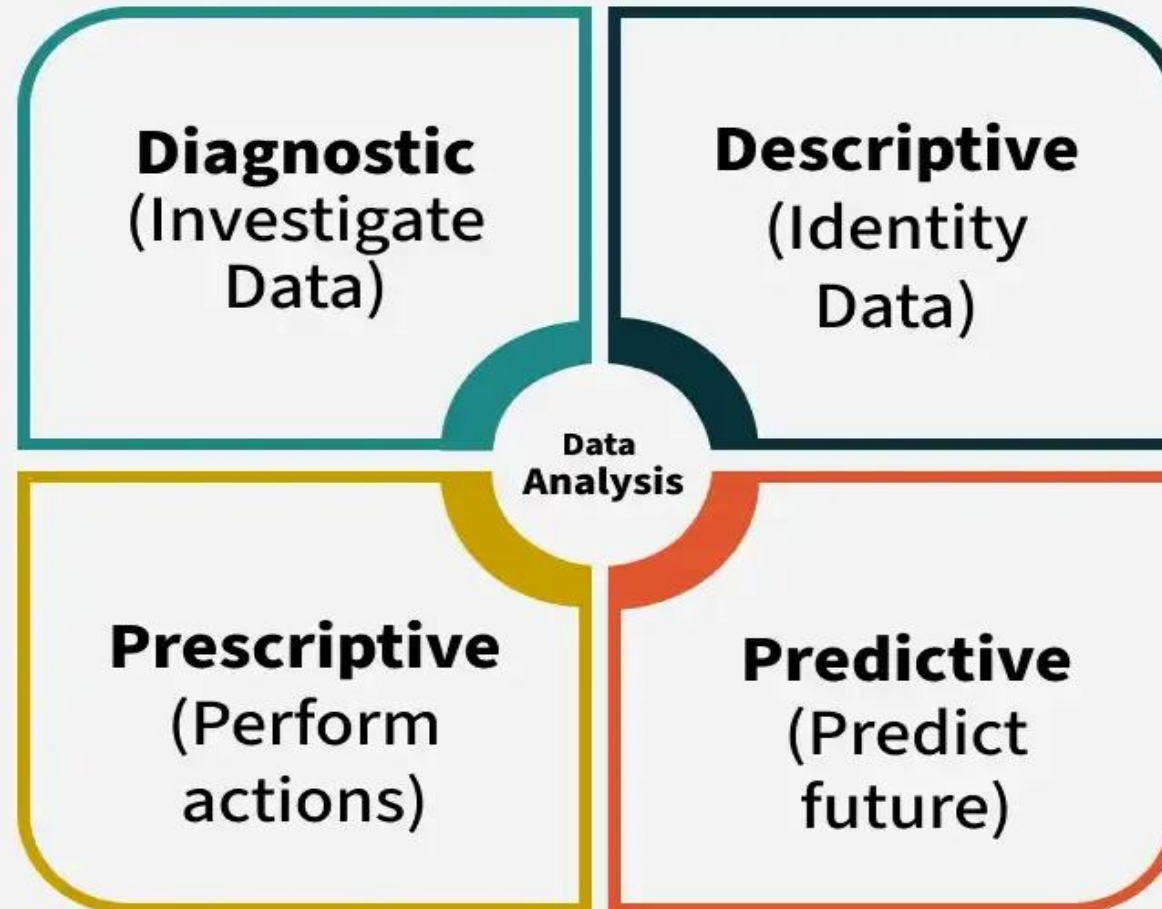
# Hypothesis testing



# Data Analysis



## Types of Data Analysis



# Data Analysis



## 1.Descriptive Analysis:

- Summarizes past data to understand what happened.
- Example: Sales reports, website traffic analysis.

## 2.Diagnostic Analysis:

- Explains why something happened by identifying causes.
- Example: Analyzing reasons for a drop in sales.

## 3.Predictive Analysis:

- Forecasts future outcomes using historical data.
- Example: Predicting customer churn or sales trends.

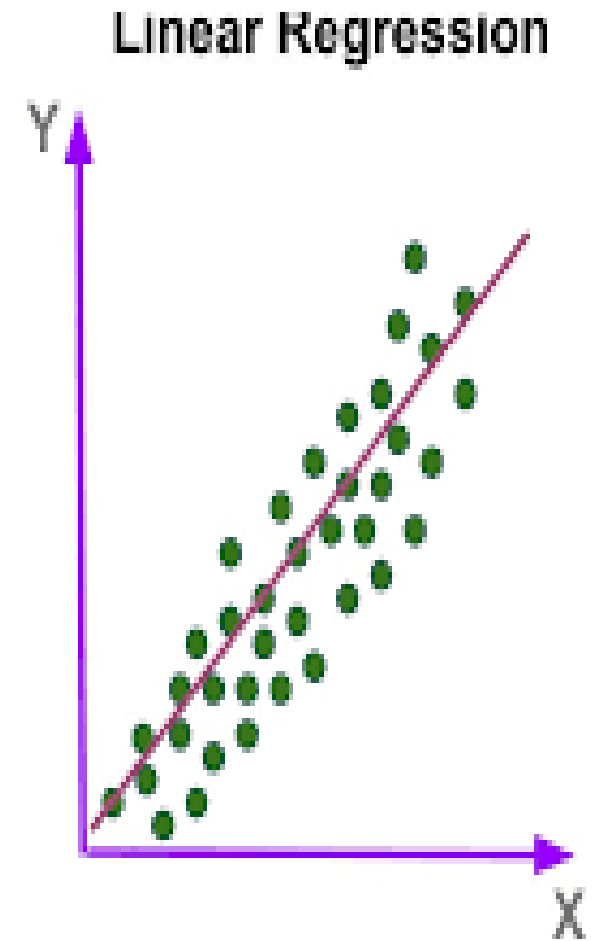
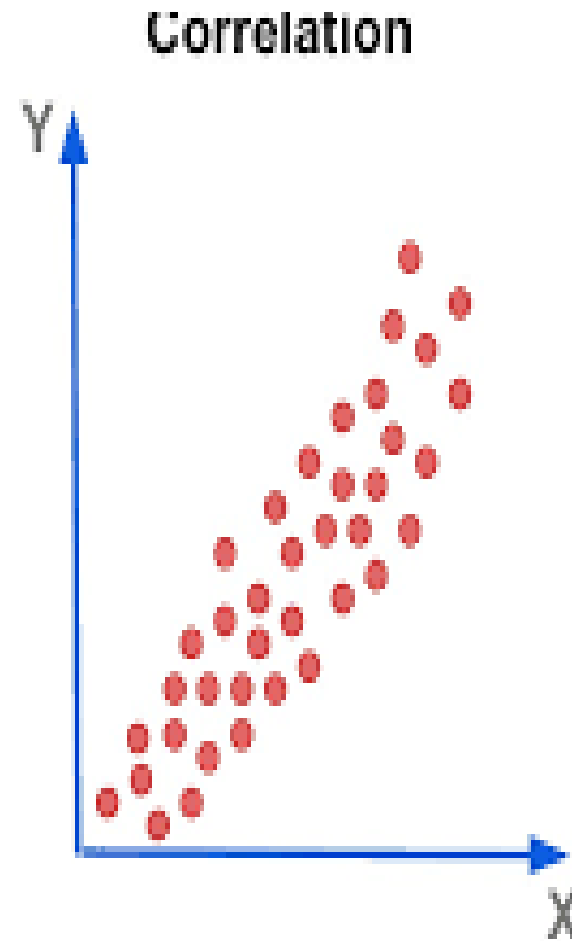
## 4.Prescriptive Analysis:

- Recommends actions to achieve desired outcomes.
- Example: Optimizing marketing strategies or supply chain operations.

# Data Analysis



- Correlation and regression are statistical methods that measure the relationship between two or more variables. Correlation shows if there is a linear relationship between variables, while regression explains how one variable affects the other.



# Data Analysis- Correlation



- **Correlation** is about **relationship strength** (how closely two variables move together).
- Determines if two variables have a linear relationship
- Measures the strength and direction of the relationship
- Ranges from -1 to 1, where -1 is a perfect negative correlation, 0 is no correlation, and 1 is a perfect positive correlation
- Doesn't show cause and effect

## **Example:**

- Height and weight often show a **positive correlation** — taller people tend to weigh more.
- Hours of social media use and study performance may have a **negative correlation** — more time scrolling might lead to lower grades.

# Data Analysis- Regression



- Correlation Just tells you if two things are related, Regression Goes further — explains how they're related and predicts outcomes.
- Describes the cause and effect between two variables
- Focuses on how one variable impacts the other
- Can "predict" a dependent (outcome) variable
- Can be designed to handle multiple independent and confounding variables

## **Example:**

- **Predicting house price** based on size, location, and number of bedrooms.
- **Predicting employee performance** based on training hours and experience.

# Data Analysis- Regression



<b>Purpose of Analysis</b>	<b>Statistical Test</b>	<b>Software</b>
To compare the mean of two groups	Independent Sample t-test	SPSS, R, Excel, Stata
To compare means of more than two groups	ANOVA (Analysis of Variance)	SPSS, R, Stata, SAS
To examine relationship between two continuous variables	Pearson Correlation	SPSS, R, Excel
To examine relationship between ordinal variables	Spearman Rank Correlation	SPSS, R, Stata
To test association between categorical variables	Chi-Square Test	SPSS, R, Stata
To predict the value of a dependent variable from one independent variable	Simple Linear Regression	SPSS, R, Excel
To predict the value of a dependent variable from multiple variables	Multiple Regression	SPSS, R,
To compare the mean of the same group before and after treatment	Paired Sample t-test	SPSS, R, Excel
To find differences when data is not normally distributed	Mann–Whitney U Test	SPSS, R
Factor analysis	KMO, EFA, CFA	SPSS, R

# Data Interpretation

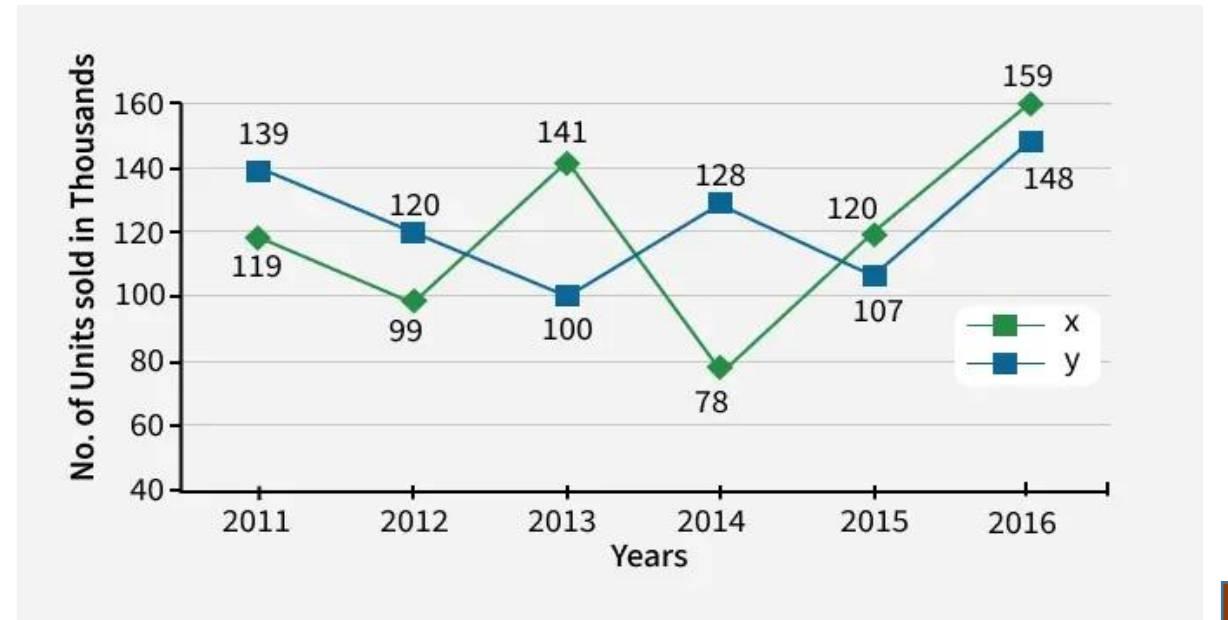
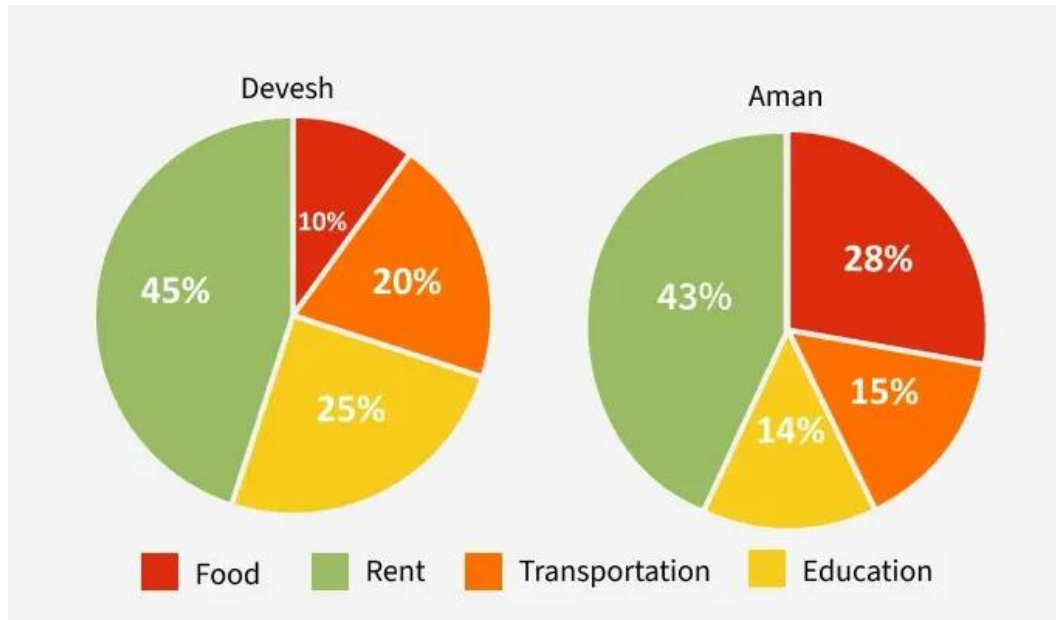
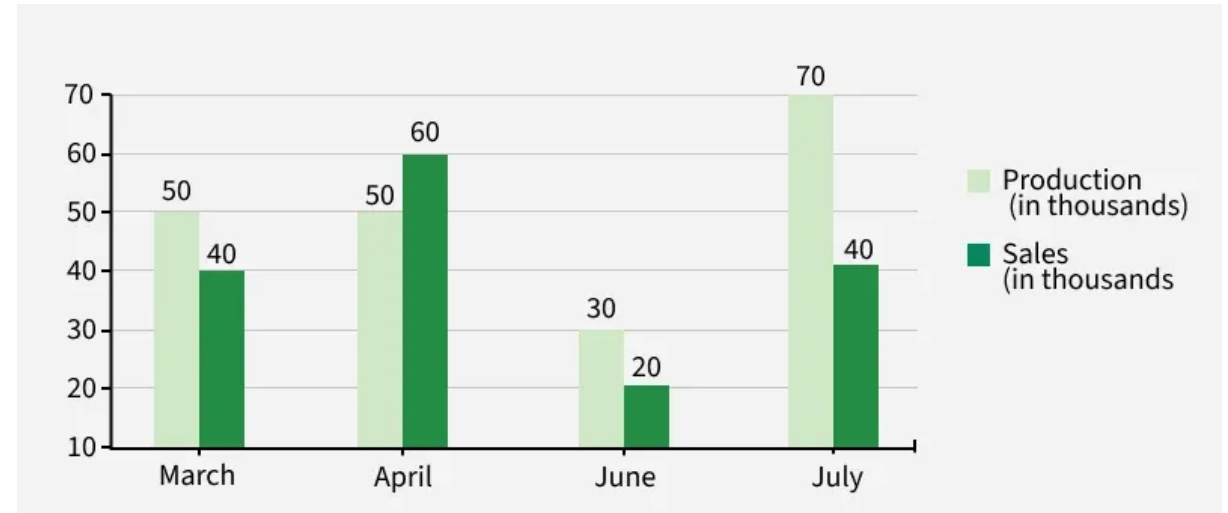


- It is to analyze structured information presented in visual formats—such as tables, bar graphs, pie charts, or line diagrams—to derive meaningful insights.
- It requires breaking down complex data sets, applying mathematical operations (like percentage changes, ratios, or averages), and using logical reasoning to solve problems or identify trends.

# Data Interpretation-types



Subject /School	Science	Hindi	English	Maths
A	360	280	590	510
B	310	280	230	470
C	430	350	370	210
D	270	300	340	190
E	290	340	450	280



# Data Analysis & Interpretation



Aspect	Data Analysis	Data Interpretation
<b>Objective</b>	Process and organize raw data to uncover patterns or trends.	Make sense of analyzed data, draw conclusions, and provide context.
<b>Process</b>	Involves data collection, cleaning, transformation, and application of analytical techniques.	Involves evaluating and synthesizing results to explain findings and suggest actions.
<b>Focus</b>	Answers "what" and "how" questions about the data.	Answers "why" and "what next" based on the analysis results.
<b>Nature</b>	More technical and quantitative.	More qualitative and subjective.

# Results & Findings



**Results** refer to the **objective presentation of analyzed data.**

- It includes:
- Statistical outputs
- Tables and charts
- Mean, percentage, standard deviation
- Test statistics (t-value, F-value, Chi-square, p-value)

# Results & Findings



**Findings** refer to the **interpretation and meaning derived from the results.**

They explain:

- What the results indicate
- Whether hypotheses are accepted or rejected
- What patterns or relationships exist

Findings answer the question:

- “What does the data mean?”

# Results & Findings



Results	Findings
Numerical/statistical output	Interpretation of those numbers
Objective presentation	Analytical explanation
No discussion	Includes reasoning and implications
Usually in tables	Usually in paragraph form



**THANK YOU!**