"ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार" - शिक्षणमहर्षी डॉ. बापूजी साळुंखे
Shri Swami Vivekanand Shikshan Sanstha, Kolhapur.
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Department of Management Studies

Course Name Statistical Methods for Business Decisions

Course Code DSC37STA11

Year & Semester MBA I Semester I

Unit No. 01

Unit Name **Descriptive Statistics**

Faculty Name Mr. V. V. Jadhav (NET, SET, MBA)

MEANING OF STATISTICS

- Statistics deals with **Quantitative Facts**
- Statistics is not about **Qualitative Expressions.**
- **Single Value does not constitute Statistics**
- Statistics is a **Science** and an **Art**.

The sale of the company gone up	The sale of company has gone up from 1 cr to 1.5 cr in 2024
India’s Import has come down	India’s import has come down from 2 Trillion USD in 2022 to 1.5 Trillion USD in 2023
Production of passenger cars has increased	Production of Passenger Cars has increased by 7% from 2023 to 2024.
Ramesh scored more marks than Suresh	Ramesh scored 15% more marks than Suresh

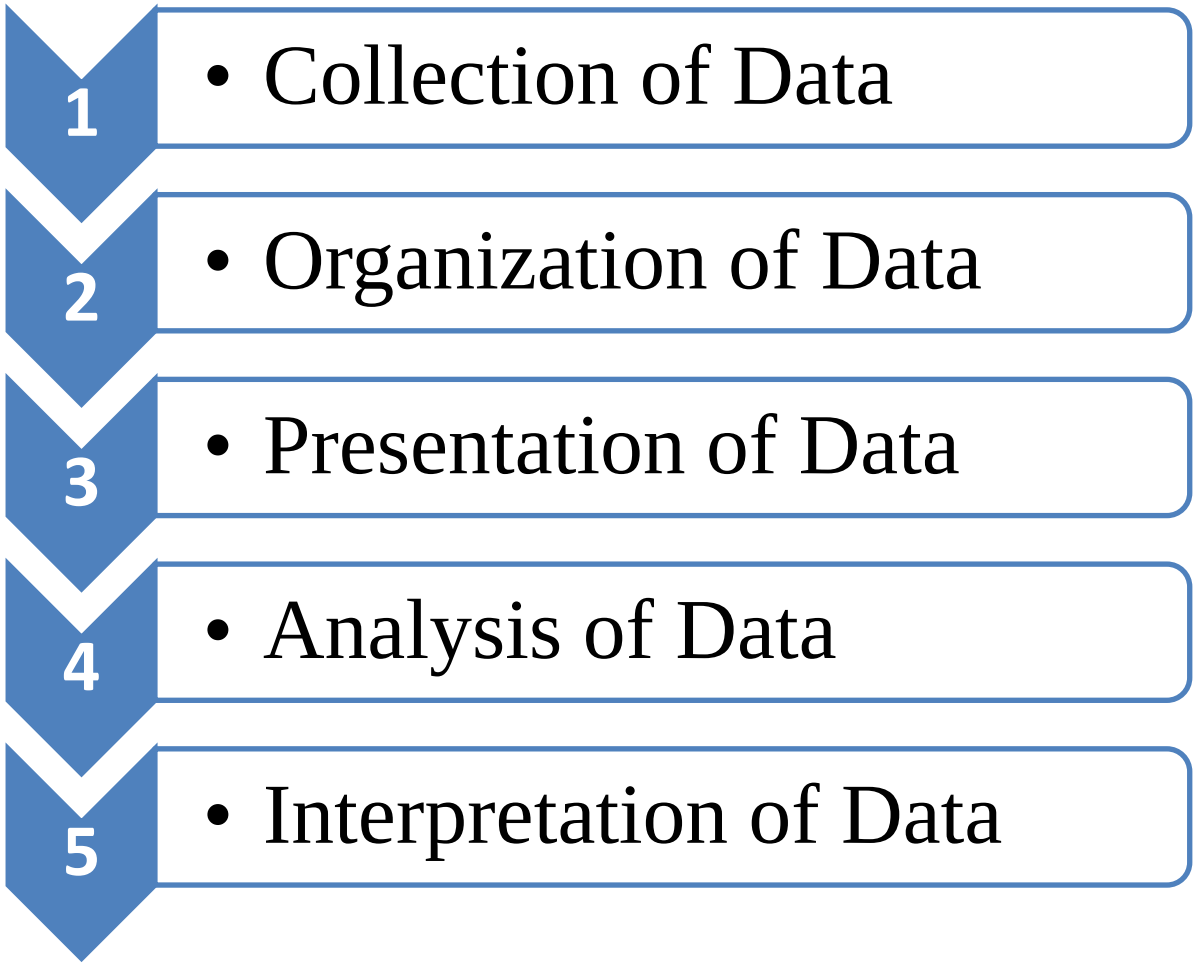
ORIGIN OF STATISTICS

- It is derived from Latin word "**STATUS**"
- Also referred from Italian word "**STATO**" used in 15th Century
- German used the word "**STATISTIK**"
- Meaning is "**Political State**"

DEFINITION OF STATISTICS

- According to Croxton and Cowden, Statistics is science of
  - **Collection**
  - **Presentation**
  - **Analysis**
  - **Interpretation** of Numerical Data

STAGES OF STATISTICS



- According to Horace Secrist, “Statistics mean **Aggregate of Facts Affected to a Marked Extent by Multiplicity of Causes Numerically Expressed**, **Enumerated or Estimated according to a Reasonable Standard of Accuracy**, **Collected in a Systematic Manner** for **Predetermined Purpose** and **Placed in Relation to Each-other.**”

CHARACTERISTICS OF STATISTICS

- **Aggregate of Facts**
- **Affected to a Marked Extent by Multiplicity of Causes**
- **Numerically Expressed**
- **Enumerated or Estimated according to a Reasonable Standard of Accuracy**
- **Collected in a Systematic Manner**
- **Predetermined Purpose**
- **Placed in Relation to Each-other**

NEED/ IMPORTANCE OF STATISTICS

- Modern Age is the Age of Statistics
- Statistics **Simplifies Complexities** and Presents data in Simple and Definite Format
- Helps to **Compare** and **Measure** the relationships between different phenomenon
- Helpful in **Framing and Formation** of Business Policies
- Helpful in **Forecasting**
- Economic Planning is Prepared on the basis of data
- Today there is hardly any Field of Human Life in which statistical concepts are not being used.

SCOPE OF STATISTICS

- Descriptive Statistics
- Inferential Statistics
- **Economics:** Consumption Data, Production Data, Demand and Supply Studies, National Income
- **Administration:** Government Policies, GDP, Population, Employment, Per Capita Income

- **Business:**
  - Market Research
  - Demand Forecasting
  - Production Planning
  - Human Resource Planning
  - Sales and Market Share
  - Financial Planning
  - Digital Marketing Strategies
  - Pricing Strategies
  - Promotion Strategies

LIMITATIONS OF STATISTICS

- Statistics **does not study Individuals**
- Statistical results might lead to **Fallacious Conclusions**
- Statistics deals with **Quantitative Facts Only**
- Statistical laws are not exact but approximate in nature hence Statistical Conclusions are **Approximate in Nature**
- Requires **Uniformity and Homogeneity of Data**
- **Needs Expertise** to make best possible use of Statistics

COLLECTION OF DATA

- Data is the New Oil
- Data is Base for Any Statistical Analysis
- Statistical results are the outcome of data processed
- Degree of Accuracy and Reliability of Statistical Results depends on the Data Collected
- Data point
- Data/ Dataset

TYPES/ SOURCES OF DATA

- Primary Data
- Secondary Data

PRIMARY DATA

- Primary data referred to those data which are collected by the Investigator himself/herself.
- Primary data are those which are **Collected Afresh and for the First Time**.
- It is **Original** in sense.
- **Raw Data**
- It is **First Hand Quantitative Information**
- **Unpolished Data**
- **Example:**
  - Customer Satisfaction Survey
  - Employee Satisfaction Survey

SECONDARY DATA

- It is refer to those facts which have been **Already Collected**
- It **Polished/ Finished** Data.
- Available in the form of Published Work
- Secondary data which are used by in Investigation but which have been **already gathered originally by someone else for some other purpose**.
- It have already been passed through the Statistical Process
- **Example:**
  - Reports
  - Research Articles

Methods of Data Collection

- **Quantitative Data** OR **Qualitative Data**
- Experiments
- Surveys
- Case Study

METHODS OF PRIMARY DATA COLLECTION

- Direct Personal Investigation/ Observation
- Indirect Oral-investigation
- Experimentation
- Interview Method
- Collection of Data through Questionnaires
- Collection of Data through Schedules (Enumerators)
- Information obtained from Correspondents or Local Sources

Some other methods of Primary Data Collection:

- Distributor/ Store Audits
- Consumer Panels
- Use of Mechanical Devices
- Projective Techniques:
  - Word Association Test
  - Sentence Completion Test
  - Story Completion Test
  - Verbal Projection Test
  - Pictorial Techniques (T. A. T.)

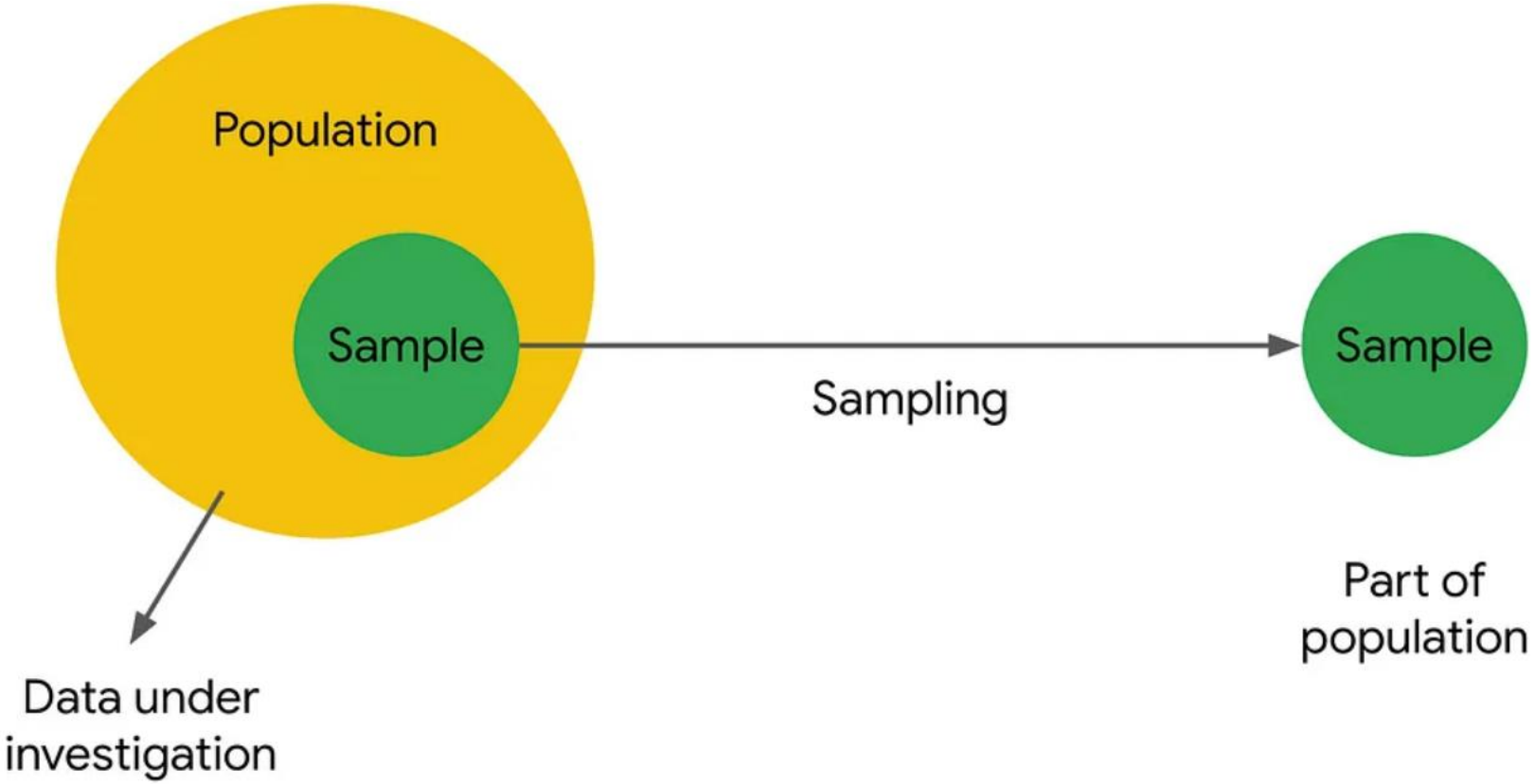
METHODS OF SECONDARY DATA COLLECTION

- Central / State/ Local Government Publications (RBI, Census Report)
- International Publications (WHO, WTO, IMF, UN)
- Reports of Commission and appointed Committees
- Publications of Research Institutes (Various Bureaus, State Universities)
- Books, Newspapers, and Magazines (Economic Times, Financial Times)
- Reports of Trade Associations (Chamber of Commerce, Trade Unions)
- Publications of Personal Investigations (Research Papers, Research Articles by Economists, Research Scholars)

- Public libraries,
- Archives, Directories, Databases, and Indexes,
- Old historical records,
- Online websites, blogs, and forums.

SAMPLING

- Universe/ Population
- Sample
- Sampling



PROBABILITY SAMPLING

- Probability sampling is a method of **Selecting A Sample from A Larger Population** where **Each Member has An Equal Probability of Being Chosen**.
- This ensures that the **Sample is Representative of The Population**
- Allows for **Generalization of Results to the Entire Population**.
- In probability sampling, **Randomness is key**, ensuring that **Biases are Minimized**.

Merits of Probability Sampling

- Equal chance of selection
- Representativeness
- Minimized Bias
- Ability to Generalize

DEMERITS OF PROBABILITY SAMPLING

- Complex
- Time Consuming
- Costly
- Non-response Bias
- Requires complete Population List
- Difficult to implement at the time of hard to reach population

NON-PROBABILITY SAMPLING

- It refers to sampling methods where **not all members of a population have an equal chance of being selected**.
- It is **More Flexible** when complete population lists are unavailable or when random selection isn't practical.
- The researcher selects respondents based on specific characteristics, ease of access, or other factors, often making it **More Convenient** and **Cost-effective**.
- However, since the sample is not selected randomly, the **results cannot be easily generalized to the broader population**.

Merits of Non-Probability Sampling

- Cost-Effective
- Time-Saving
- Flexibility in Sampling
- Useful for Pilot Studies
- Practical in Real-World Scenarios

Demerits of Non-Probability Sampling

- Lack of Representativeness
- Higher Risk of Sampling Bias
- Lack of Transparency
- Generalization challenges
- May not capture all views

DATA ORGANIZATION & CLASSIFICATION

- Organization of Data refers to **Arrangement of Figures and facts for further analysis.**
- Important method of Organizing the data is Classifying the Data on the basis of their characteristics.
- This process is called as Classification of Data.
- **Classification of the Data is the activity of grouping the data into various classes on the basis of some criteria**.

DATA PRESENTATION

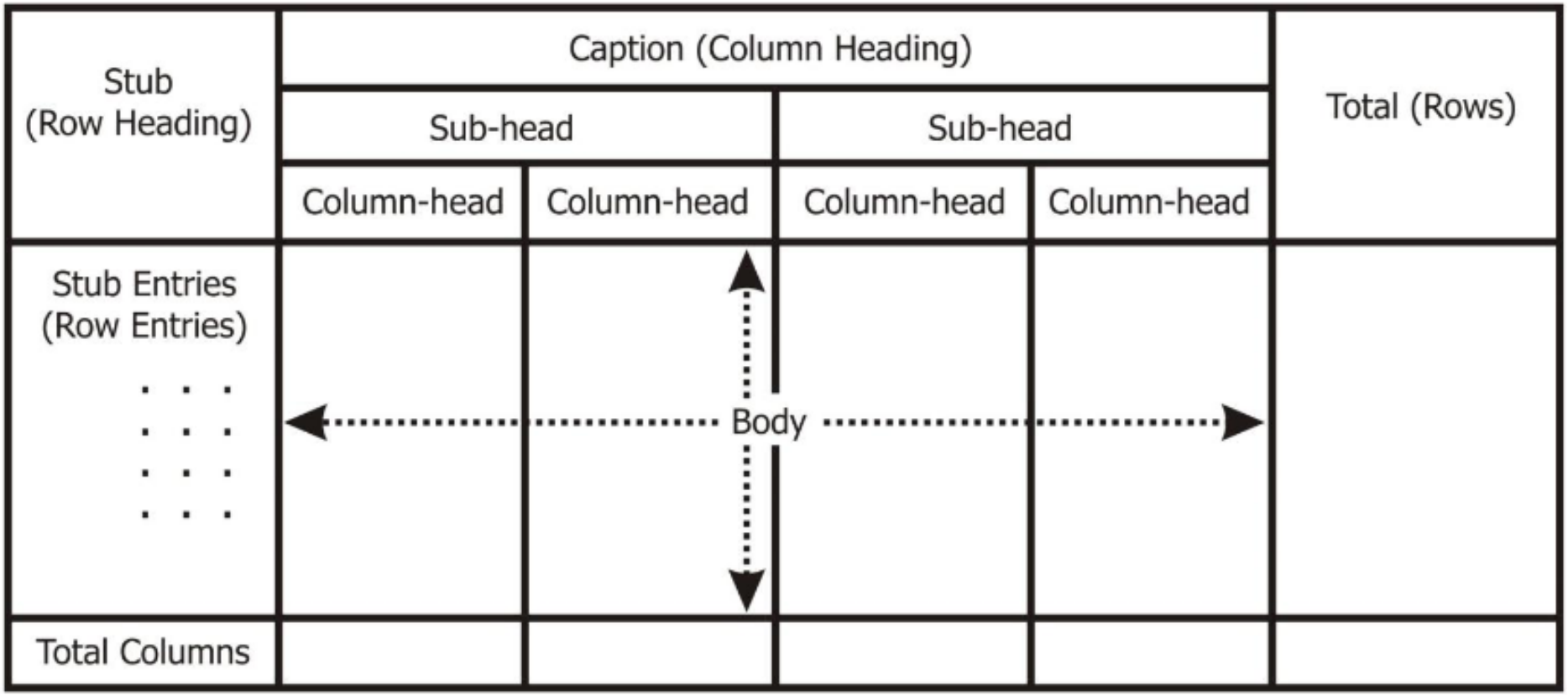
- **Textual Presentation** – Presenting data in the form of Paragraph. Not Very Impressive and Effective Method
- **Tabular Presentation**
- **Diagrammatic Presentation**
- **Graphic Presentation**

TABULAR

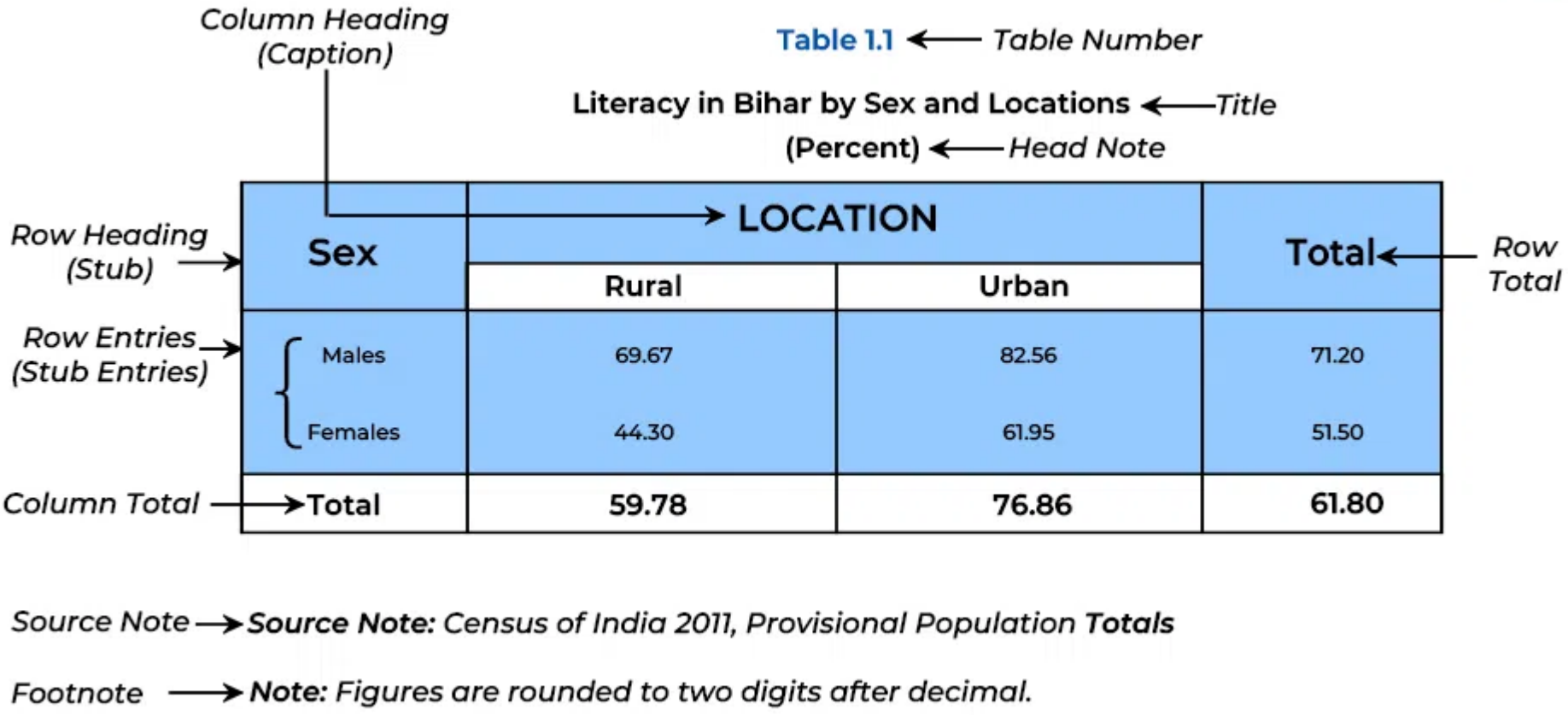
(1) Table number	• Table number is the very first item mentioned on the top of each table for easy identification and further reference.
(2) Title	• Title of the table is the second item that is shown just above the table. • It narrates the contents of the table, hence it has to be very clear, brief, and carefully worded.
(3) Head note	• It is the third item just above the table and shown after the title. • It gives information about units of data like, 'amount in rupees or $', "quantity in tonnes', etc. • It is generally given in brackets.
(4) Captions or Column headings	• At the top of each column in a table, a column designation/head is given to explain the figures of the column. • This column heading is known as 'caption'.
(5) Stubs or Row headings	• The title of the horizontal rows is known as 'stubs'.
(6) Body of the table	• It contains the numeric information and reveals the whole story of investigated facts. Columns are read vertically from top to bottom and rows are read horizontally from left to right.
(7) Source note	• It is a brief statement or phrase indicating the source of data presented in the table.
(8) Footnote	• It explains the specific feature of the table which is not self-explanatory and has not been explained earlier. For example, points of exception if any.

TABULAR PRESENTATION OF DATA

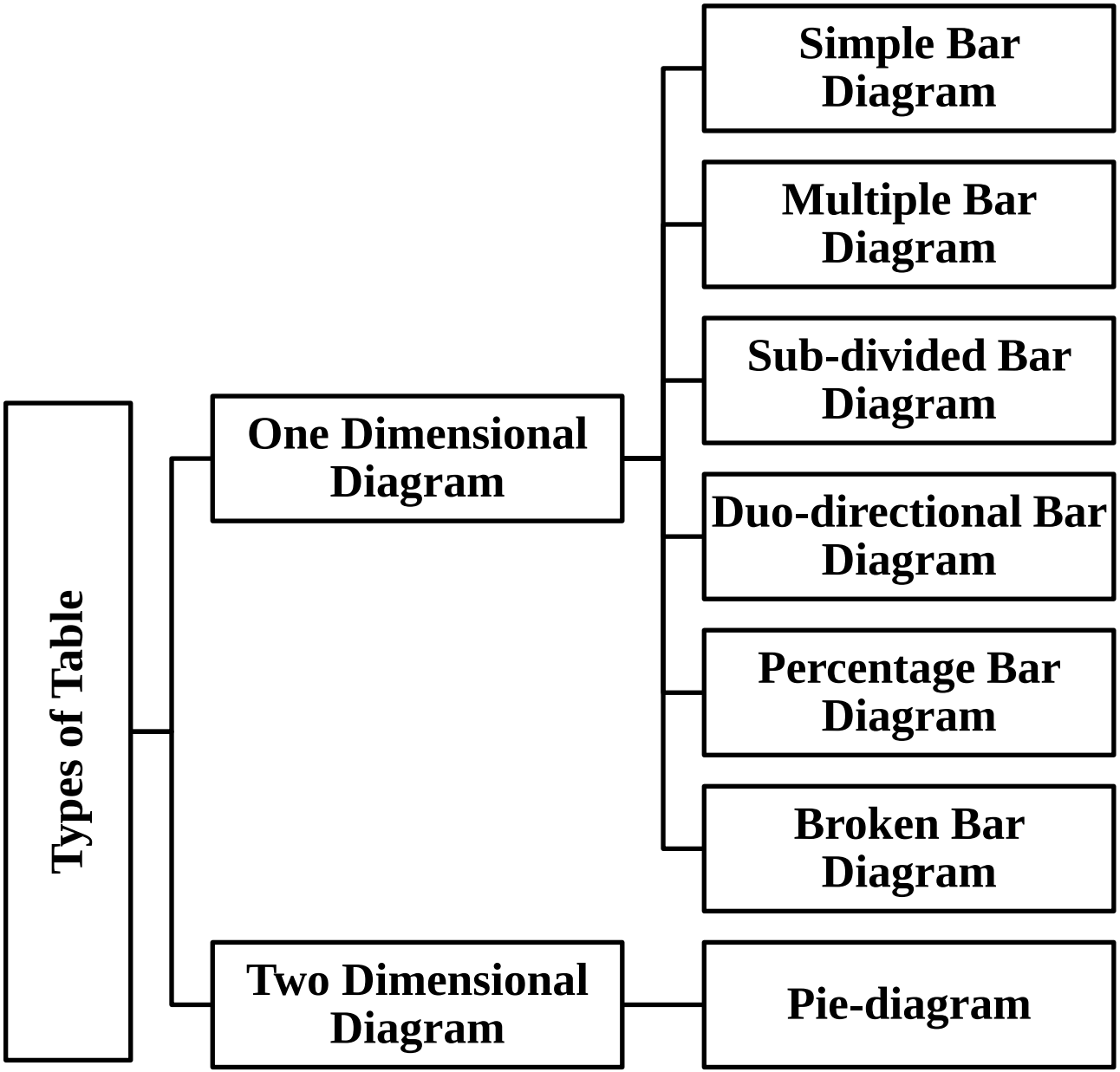
Table Number: .....
Title: .....
(Head Note, if any)



Source Note:
Footnote:


Column Heading (Caption)
Table 1.1
Table Number
Literacy in Bihar by Sex and Locations
Title
(Percent)
Head Note
Row Heading (Stub)
Sex
LOCATION
Rural
Urban
Total
Row Total
Row Entries (Stub Entries)
Males
69.67
82.56
71.20
Females
44.30
61.95
51.50
Column Total
Total
59.78
76.86
61.80
Source Note
Source Note: Census of India 2011, Provisional Population Totals
Footnote
Note: Figures are rounded to two digits after decimal.

DIAGRAMMATIC PRESENTATION



Graphical Presentation

- Time Series Graphs
- Frequency Distribution Graphs
  - Histograms
  - Frequency Polygon
  - Cumulative Frequency/ Ogive