UNIT-IV PRESENTATION OF DATA: Construction of tables with one or more factors of classification; Diagrammatic and Graphical representation of non-frequency data; Frequency distribution, cumulative frequency distribution and their graphical representation - histogram, Column Graphs, Bar Graphs, Line Charts, Pie Chart, Data Interpretation – Introduction and approach.

Content

Here's a detailed lecture covering each topic under **"Presentation of Data"** in an undergraduate syllabus.

TYPES OF DATA

Data are the foundation stones and basic raw material in relation to any statistical investigation that can be counted, classified, measured or quantified. Types of Data are following;

1. ON THE BASIS OF CHARACTERISTICS OF FACTS Data may be divided into two types;
    1. Quantitative Data or Numerical Data: These types of data can be measured directly such as age, income, production, marks etc. those facts are called variables and variables may be discrete or continuous. Discrete variable– Those variables whose values are individually distinct and discontinuous. There is a definite difference between two variables. According to Boddington, "Discrete variables is one where the variables (Individual values) differ from each other by definite amounts." For example – number of students of a class, number of children in a family, number of cattle's etc. It takes integral values such as 0, 1, 2, 3, 4 …etc. Continuous variable – A continuous variable is one which assumes all values with in an interval. That is no definite breaks are visible in this type of series. For example – age, weight, height…… Questions; State which of the following represents Discrete data or Continuous data? I. No. of accidents on each day in a month II. Lengths of 1,000 bolts produced in a factory III. Speed of an automobile in kilometer per hour IV. No. of books on a library shelf
    2. Qualitative Data or Categorical Data: They include data relating to such facts which can't be measured directly but are counted or categorized to the basis of attributes such as literates, illiterates, unemployed, honest etc. are called attributes. For example- population can be classified on the basis of males and females or males may be classified on the basis of marital status, i.e. married or unmarried. Qualitative Data may further be classified into two categories

2. ON THE BASIS OF VARIABLES On the basis of variables, also data may be of two types;

    1. Univariate Data: When the frequencies are determined on the basis of one variable. For example – no. of workers on the basis of wages, no. of persons on the basis of age etc.

    2. Bivariate Data: When the data are edited or presented on the basis of two variables simultaneously. For this two-way frequency table is constructed, one variable is placed horizontally and the second one vertically. For example – to present the number of students in one table on the basis of marks obtained in two subjects, to tabulate the no. of persons in one table on the basis of two variables i.e. height and weight.

3. ON THE BASIS OF ARRANGEMENTS Data may be categorized into two types;

    (1) Raw Data: When the data is arranged and analyzed. It is called 'Raw' because it is unprocessed by statistical methods.

(2) Arrange Data: When the data is processed and is arranged, summarized, classified and tabulated in proper way. Terms like 'Data Point' and 'Data Set' are also used in order to distinguish between the numbers relating to individual or single facts and the aggregate of facts. For example– the data of production of sugar for ten years will be termed as 'Data Set' and the figures for production of one year will be as 'Data Point'.

Presentation of Data

Data presentation refers to the process of organizing, summarizing, and visually representing data to facilitate interpretation and decision-making. It helps in analyzing trends, patterns, and relationships in data effectively.

Importance of Data Presentation

- Makes large datasets easier to understand
- Helps in identifying trends and comparisons
- Facilitates quick decision-making
- Enhances communication of findings

2. Construction of Tables with One or More Factors of Classification

Tables are one of the most fundamental ways of presenting data in a structured format.

Elements of a Table

A well-structured table consists of:

1. **Title** – Clearly describes the content of the table
2. **Rows & Columns** – Rows contain observations, and columns contain variables
3. **Headings** – Define what data is contained in rows and columns
4. **Body** – The main numerical or categorical data
5. **Footnotes** – Additional clarifications

Types of Tables

Simple Table (One-Factor Classification)

- A table with only one category of classification
- Example: A table showing student attendance for a month

Day	No. of Students Present
Mon	45
Tue	48
Wed	50

Complex Tables (Multi-Factor Classification)

- Data is classified based on two or more factors
- Example: A table showing student attendance by gender

Day	Male	Female	Total
Mon	25	20	45
Tue	28	20	48
Wed	30	20	50

3. Diagrammatic and Graphical Representation of Non-Frequency Data

Visual representation helps in better understanding of data trends.

Types of Diagrams and Graphs

1. Column Graphs & Bar Graphs

- Used to compare discrete categories
- Bars can be vertical (column graph) or horizontal (bar graph)
- Example: A bar graph representing the number of students in different courses

2. Line Charts

- Used for representing trends over time
- Example: Monthly sales trend of a company

3. Pie Charts

- Circular representation divided into sectors
- Used for percentage distribution of data
- Example: Market share of different companies

4. Frequency Distribution & Cumulative Frequency Distribution

Frequency Distribution & Graphical representation

A frequency distribution is a table that shows the number of observations in different classes or intervals.

Class Interval	Frequency (f)

0 – 10	5
10 – 20	8
20 – 30	12

Cumulative Frequency Distribution & Graphical representation

Cumulative frequency is the running total of frequencies.

Class Interval	Frequency (f)	Cumulative Frequency
0 - 10	5	5
10 - 20	8	13
20 - 30	12	25

5. Graphical Representation of Frequency Distribution

Histogram

- A bar-like representation for continuous data
- No gaps between bars
- Represents the frequency of intervals

Cumulative Frequency Curve (Ogive)

- A line graph representing cumulative frequency distribution
- Helps in estimating median and quartiles

6. Data Interpretation: Introduction and Approach

What is Data Interpretation?

- The process of analyzing and making sense of presented data
- Used in research, business analytics, social sciences, etc.

Approach to Data Interpretation

1. **Understanding the Data Type** – Identify categorical or numerical data
2. **Analyzing Graphs & Charts** – Identify trends, comparisons, and relationships
3. **Drawing Insights** – Make logical conclusions based on the given data

Conclusion

- Data presentation through tables and graphs simplifies analysis
- Choosing the right method (tables, charts, or graphs) depends on the nature of the data
- Effective data interpretation helps in meaningful decision-making

Would you like detailed examples or case studies for any section?

*Note- Queries, doubts, Numerical problems will be discussed only in class.