

BS – Unit I

Diagrammatic presentation of data

- Diagrammatic Presentation of Data gives an immediate understanding of the real situation to be defined by data in comparison to the [tabular presentation of data](#) or textual representations. Diagrammatic presentation of data translates pretty effectively the highly complex ideas included in numbers into more concrete and quickly understandable form. Diagrams may be less certain but are much more efficient than tables in displaying the data. There are many kinds of diagrams in general use. Amongst them the significant ones are the following:
 - (i) Geometric diagram
 - (ii) Frequency diagram
 - (iii) Arithmetic line graph

- **Basics of Diagrammatic Presentation**
- **Concept of Diagrammatic Presentation**
- Diagrammatic presentation is a technique of presenting numeric data through Pictograms, Cartograms, Bar Diagrams & Pie Diagrams etc. It is the most attractive and appealing way to represent statistical data. Diagrams help in visual comparison and have a bird's eye view.
- Under Pictograms, we use pictures to present data. For example, if we have to show the production of cars, we can draw cars. Suppose, production of cars is 40,000. We can show it by a picture having four cars, where 1 Car represents 10,000 units.
- Under Cartograms, we make use of maps to show the geographical allocation of certain things.
- Bar Diagrams are rectangular in shape placed on the same base. Their height represents the magnitude/value of the variable. Width of all the bars and gap between the two bars is kept the same.
- Pie Diagram is a Circle which is sub-divided or partitioned to show the proportion of various components of the data.

Example for Cartogram

- World population - 2018



Example for Pictogram



HEALTH IN NUMBERS

Doctors available per 1,000 people

CUBA



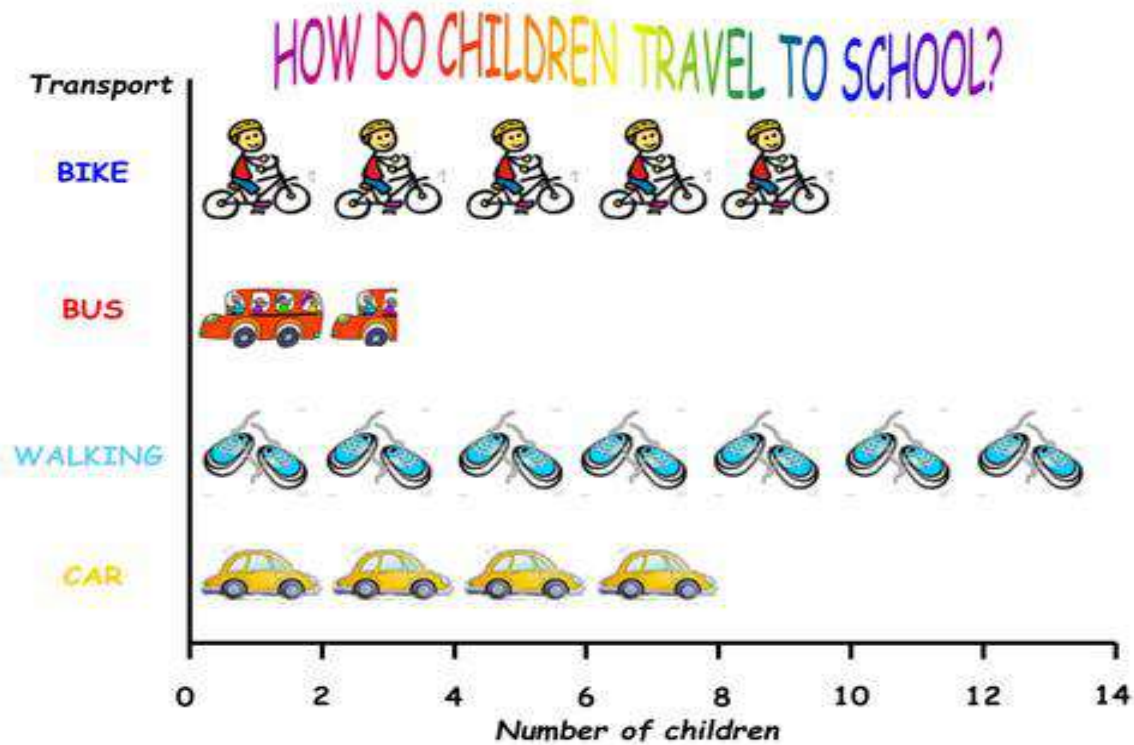
SPAIN



CANADA



Pictogram



General Guidelines

- **Title** – Every diagram must be given a suitable 'Title' which should be small and self-explanatory.
- **Size** – Size of the diagram should be appropriate neither too small nor too big.
- **Paper used** – Diagrams are generally prepared on blank paper.
- **Scale** – Under one-dimensional diagrams especially 'Bar Diagrams' generally Y-axis is more important from the point of view of the decision of scale because we represent magnitude along this axis.
- **Index** – When two or more variables are presented and different types of line/shading patterns are used to distinguish, then an index must be given to show their details.
- **Selection of Proper Type of Diagram** – It is very important to select the correct type of diagram to represent data effectively.

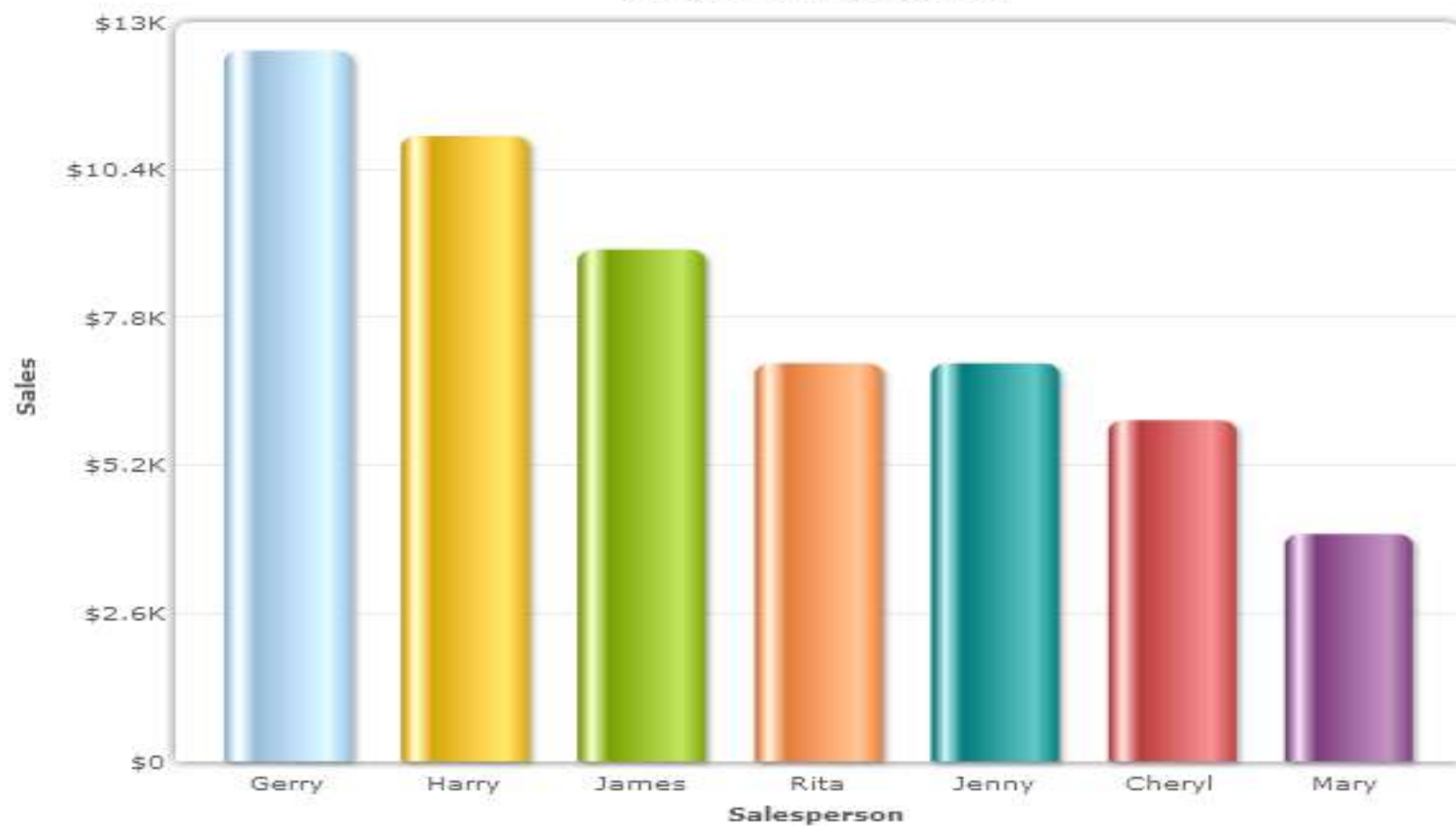
Advantages of Diagrammatic Presentation

- (1) Diagrams Are Attractive and Impressive:
 - Data presented in the form of diagrams are able to attract the attention of even a common man.
- (2) Easy to Remember
 - Diagrams have a great memorizing effect.
 - The picture created in the mind by diagrams last much longer than those created by figures presented through the tabular form.
- (3) Diagrams Save Time
 - It presents complex mass data in a simplified manner.
 - Data presented in the form of diagrams can be understood by the user very quickly.

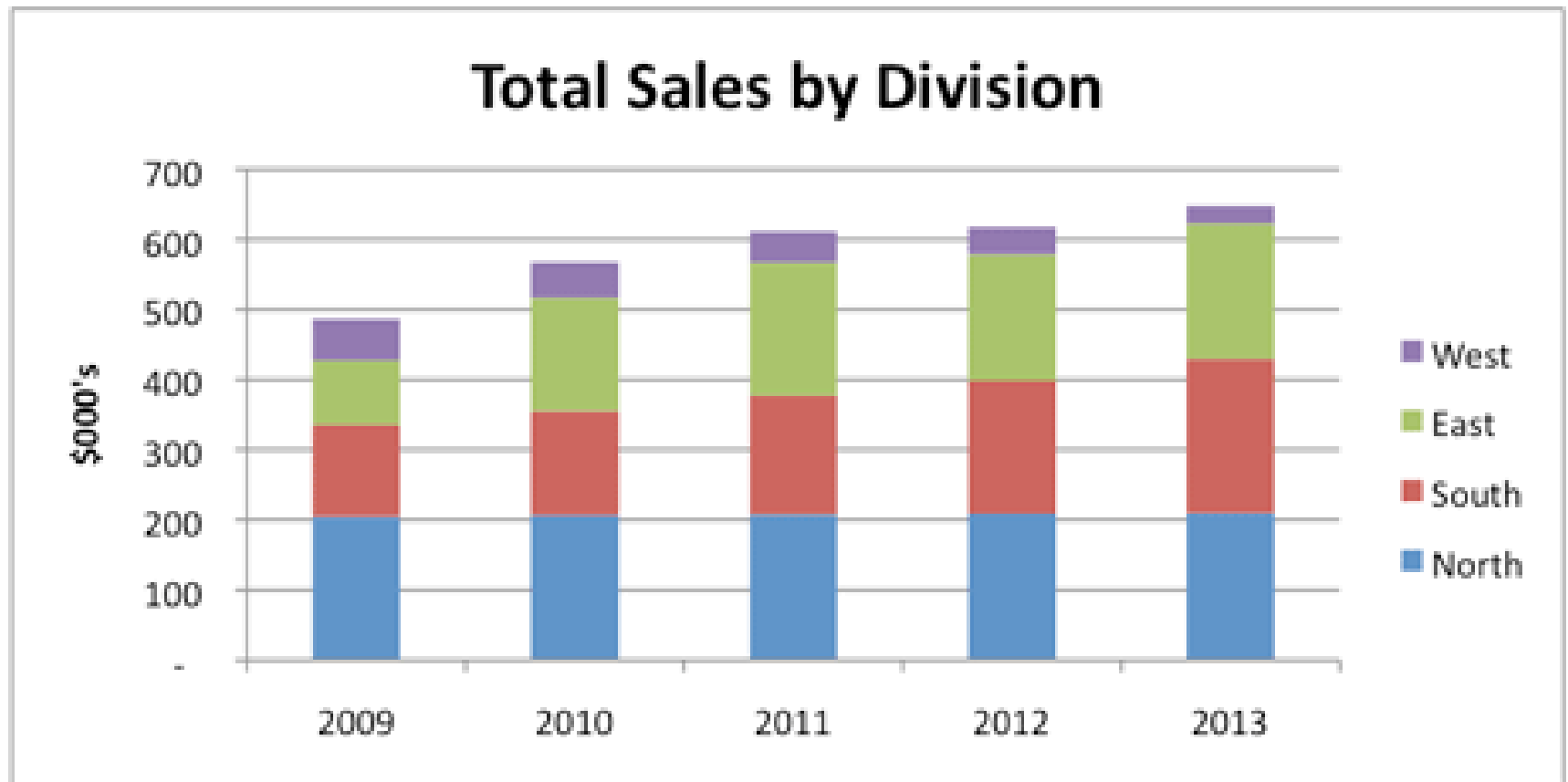
- (4) Diagrams Simplify Data
- Diagrams are used to represent a huge mass of complex data in a simplified and intelligible form, which is easy to understand.
- (5) Diagrams Are Useful in Making Comparisons
- It becomes easier to compare two sets of data visually by presenting them through diagrams.
- (6) More Informative
- Diagrams not only depict the characteristics of data but also bring out other hidden facts and relations which are not possible from the classified and tabulated data.

- **Types of One-dimensional Diagram:**
- One dimensional diagram is that diagram in which the only length of the diagram is considered. It can be drawn in the form of a line or in various types of bars.
- Following Are the Types of One-dimensional Diagram:
- (1) Simple Bar Diagram
- Simple Bar diagram comprises of a group of rectangular bars of equal width for each class or category of data.
- (2) Multiple Bar Diagram
- This diagram is used when we have to make a comparison between two or more variables like income and expenditure, import and export for different years, marks obtained in different subjects in different classes, etc

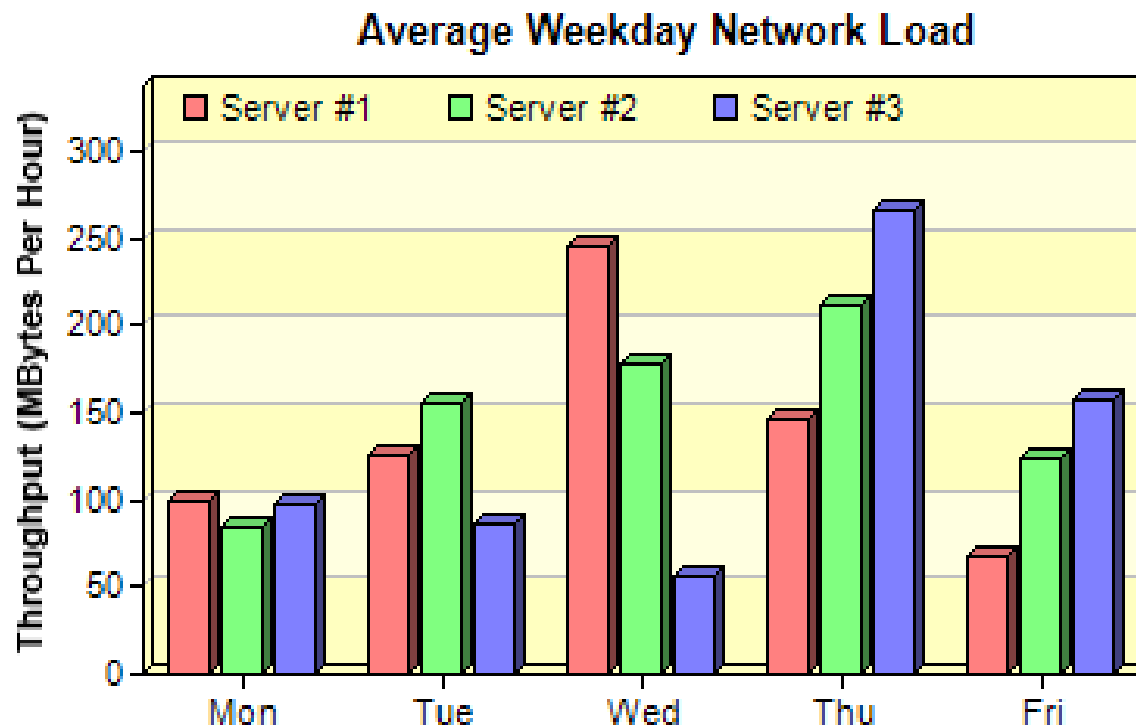
First Quarter Sales by Salesperson (in USD)
(Jan,2013 to Mar,2013)



Component Bar Chart

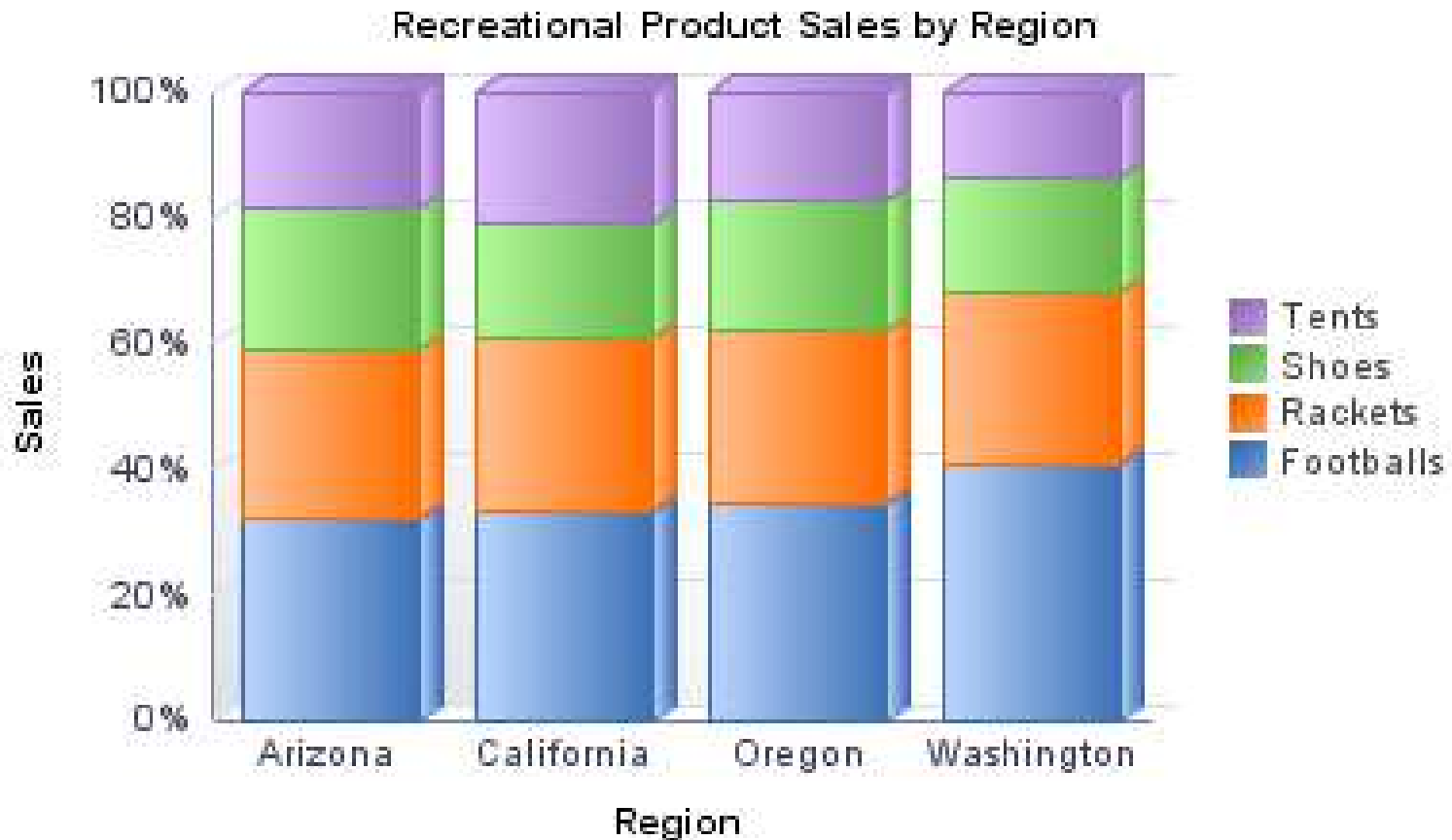


Multiple Bar chart



- (3) Sub-divided Bar Diagram
- This diagram is constructed by sub-dividing the bars in the ratio of various components.
- (4) Percentage Bar Diagram
- Sub-divided bar diagram presented on a percentage basis is known as Percentage Bar Diagram.

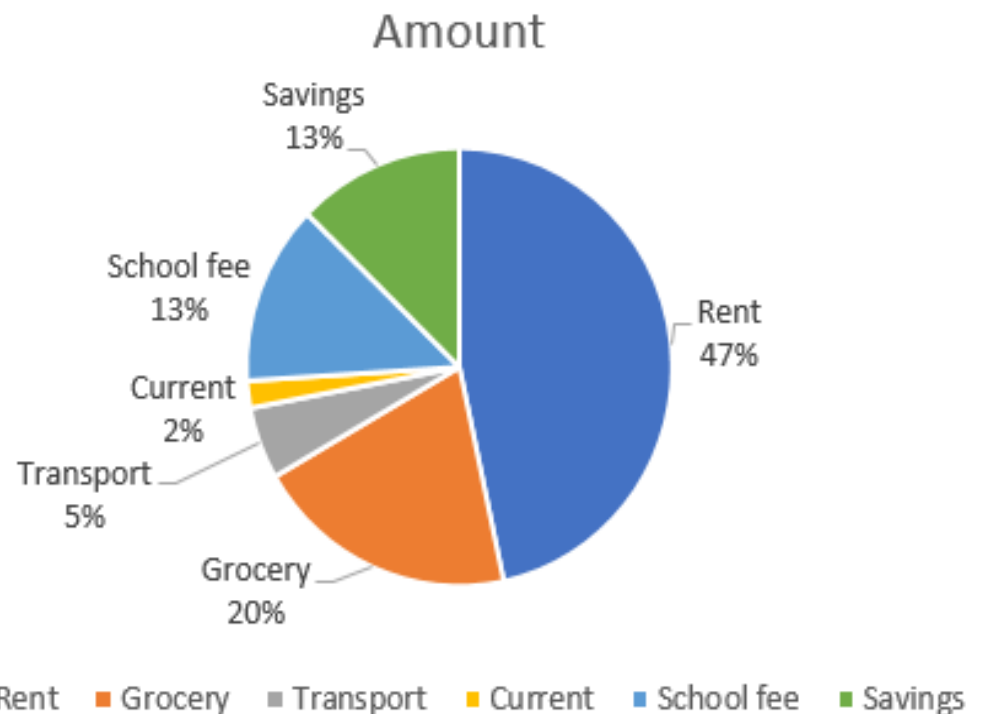
Percentage Bar Chart



- **Meaning of Pie Diagram:**
- A Pie Diagram is a circle divided into sections. The size of the section indicates the magnitude of each component as a part of the whole.
- **Steps Involved in Constructing Pie Diagram**
- Convert the given values in percentage form and multiply it with 3.6' to get the amount of angle for each item.
- Draw a circle and start the diagram at 12'O clock position.
- Take the highest angle first with protector (D) and mark lower angles successively.
- Shade different angles differently to show distinction in each item.

Pie Chart Examples

1	Expenses	Amount
2	Rent	7000
3	Grocery	3000
4	Transport	800
5	Current	300
6	School fee	2000
7	Savings	1900
8		
9		
10		
11		
12		
13		



Assignment

- **Solved Questions:**
- Q.1- Why Diagrammatic Presentation is Better Than Tabulation of Data?
- **ANS:** It makes data more attractive as compared to tabulation and helps in visual comparison.
- Q.2- Why Media Persons Prefer Diagrammatic Presentation of Data?
- **ANS:** Because it has 'eye-catching effect' and long-lasting impact upon its reader/viewers.
- Q.3- What Will Be the Degree of an Angle in the Pie-diagram if a Family Spends 50% of Its Income on Food?
- **ANS:** $(50 \div 100) \times 360$ (Or) $50 \times 3.6 = 180'$
- Q.4- Which Bar Diagram is Used to Show Two or More Characteristics of the Data?
- **ANS:** Multiple bar diagram

- Q.5-mention the Total of the Degrees of All the Angles Formed at the Centre of a Circle.
- **ANS:** 360°
- Q.6-name a Bar Diagram Where Height of All the Bars is the Same.
- **ANS:** Percentage Bar Diagram
- Q.7-which Diagram Can Be Used to Depict Various Components of a Variable?
- **ANS:** Sub-Divided Bar Diagram
- Q.8-What is a Multiple Bar Diagram?
- **ANS:** Multiple Bar diagram is one that shows more than one characteristic of data.
- Q.9-What is Another Name of Sub-divided Bar Diagram?
- **ANS:** Component Bar Diagram.

Tabulation of Data

- **Tabulation Meaning:**
- Tabulation is a systematic & logical presentation 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 further statistical analysis and interpretation.
- To put it in other words, the method of placing organized data into a tabular form is called as tabulation. It may be complex, double or simple depending upon the nature of categorization.

Major Objectives Of Tabulation:

- **(1) To Simplify the Complex Data**
- It reduces the bulk of information i.e. raw data in a simplified and meaningful form so that it could be easily by a common man in less time.
- **(2) To Bring Out Essential Features of the Data**
- It brings out the chief/main characteristics of data.
- It presents facts clearly and precisely without textual explanation.
- **(3) To Facilitate Comparison**
- Presentation of data in row & column is helpful in simultaneous detailed comparison on the basis of several parameters.

- **(4) To Facilitate Statistical Analysis**
- Tables serve as the best source of organized data for further statistical analysis.
- The task of computing average, dispersion, correlation, etc. becomes much easier if data is presented in the form of a table.
- **(5) Saving of Space**
- A table presents facts in a better way than the textual form.
- It saves space without sacrificing the quality and quantity of data.

Assignment

- **Multiple Choice Questions:**
- Q.1- Tabulation makes the data
 - a. Simple
 - b. Complex
 - c. Very complex
 - d. None of the above
- Q.2 Which of the following are the objectives of Constructing table for presenting data?
 - a. To bring out essential features of the data
 - b. To facilitate statistical analysis
 - c. Saving of Space
 - d. All of the above
- Q.3 Tabular presentation of data saves space without compromising _____ of data?
 - a. Quality of data
 - b. Quantity of data
 - c. Both (a) and (b)
 - d. None of the above
- **Answer Key** 1-a, 2-d, 3-c

Frequency Distribution

Raw Data: The data without any arrangement.

Raw means 'uncooked'. Data without any modification/arrangement is called raw data.

Data Array: Data arranged in increasing/decreasing order is called data array.

Advantages of Data array:

1. It is possible to identify the Maximum and minimum values in a data set.

2. It is possible to identify the repeated observations
3. We can divide the data easily into different parts.

The disadvantage is that as far as space is considered, we are not reducing the data size. The data size remains same only the arrangement is different.

Suppose the marks obtained by 10 students in a objective test conducted for 10 marks is as follows.

6, 2, 7, 9, 0, 4, 3, 8, 5, 2 is called raw data

The data array is as follows:

Increasing order is 0, 2, 2, 3, 4, 5, 6, 7, 8, 9

Decreasing order is 9, 8, 7, 6, 5, 4, 3, 2, 2, 0.

Frequency distribution is a table consisting of two columns namely Class interval and Frequency. It is a data summarization tool. It condenses the data. Once a raw data is converted into frequency distribution, we no longer will have accessibility to original data. In a way it results in data loss.

Suppose the marks obtained by 10 students in a objective test conducted for 10 marks is as follows.

6, 2, 7, 9, 0, 4, 3, 8, 5, 2 is called raw data

The frequency distribution is constructed for this data as follows. We will take 5 class intervals of 2 units width.

Class Interval	Frequency
0 – 2	3
2 – 4	2
4 – 6	2
6 – 8	2
8 - 10	1

Diagrammatic presentation of frequency distribution

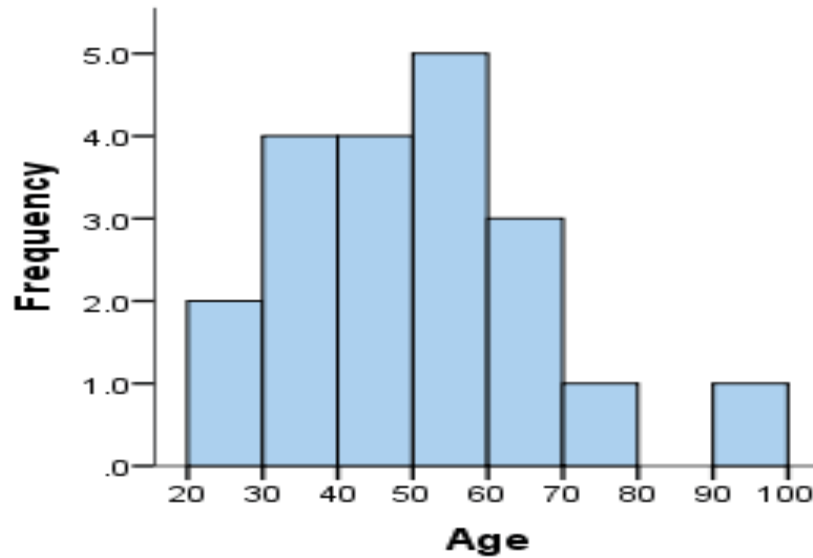
Frequency distribution can be presented in a graph by drawing

1. Frequency Histogram
2. Frequency Polygon
3. Frequency Curve

Frequency Histogram

A **frequency histogram** is a type of bar graph that shows the **frequency**, or number of times, an outcome occurs in a data set. It has a title, an x-axis, a y-axis, and vertical bars to visually represent the data. **Frequency histograms** help organize data and make it easier to understand.

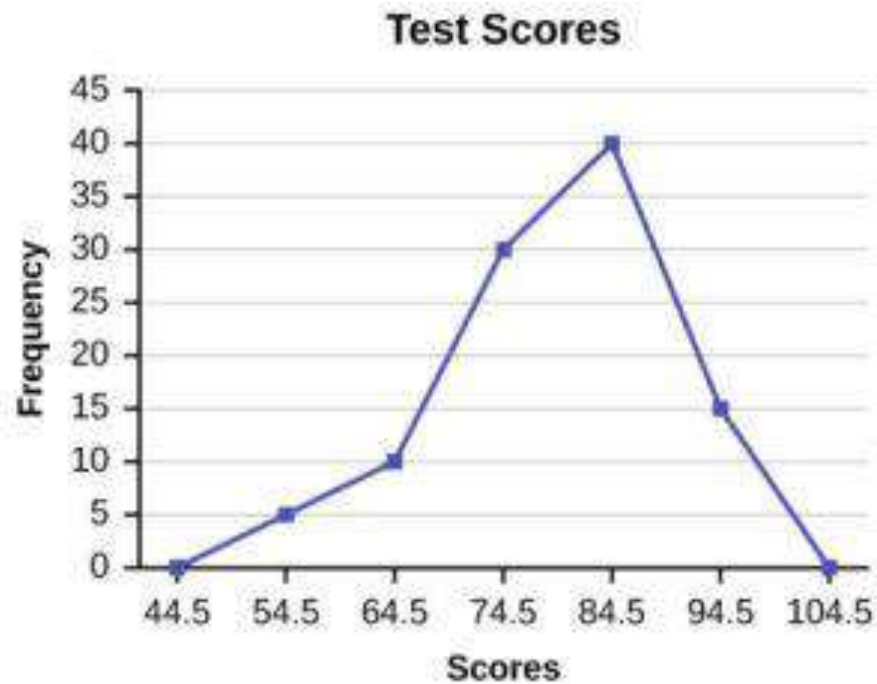
Histogram with age Vs frequency



Frequency Polygon

A **frequency polygon** is a graph constructed by using lines to join the midpoints of each interval, or bin. The heights of the points represent the **frequencies**. A **frequency polygon** can be created from the histogram or by calculating the midpoints of the rectangles from the **frequency** distribution table.

Graph showing test scores Vs Frequency



Frequency Curve

- A **frequency Curve** is a graph constructed by joining the midpoints of each interval, or rectangle by free hand. The heights of the points represent the **frequencies**. A **frequency Curve** can be created from the histogram or by calculating the midpoints of the rectangles from the **frequency** distribution table.

Graph showing Height Vs Frequency

