Presentation of Data:

The raw data which is, in general, huge and unwieldy, needs to be organized and presented in meaningful and readily comprehended form in order to facilitate further statistical analysis.

There are three broad ways of presenting data. These are: (1) Textual presentation, (2) Tabular presentation, (3) Graphic or diagrammatic presentation

Textual Presentation: In textual presentation, data is presented along with the text; that is, data may be incorporated in a paragraph of text.

Tabular Presentation: In this presentation, data are arranged in a systematic way in rows and columns. A table will have at least the four essential parts: title, stub, caption, body. There may also be present a footnote and prefatory note.

Title: A title should accompany every table and is customarily placed above the table. The title should be clearly state briefly about what data are shown in the table. When more than one table is included in a study, it is desirable to number the tables consecutively in order that each one may be identified by number rather than by title.

Stub: The extreme left part of the table; that is, the left-hand column and its heading is called "stub", which is meant to describe the nature of the rows.

Caption: It is the heading of the other columns i.e., the upper part of the table which gives a description of the various columns is the caption of the table. The units of measurements for the data for each column are given in caption.

Body: The body is the principal part of the table, where all the relevant figures are exhibited.

Footnotes and Prefatory Note: A Prefatory note, one or more footnotes and a source note may be appended to a table. The prefatory note is, placed just below the title and in small or less prominent type. The prefatory note provides an explanation concerning the entire table or a substantial part of it. Explanations concerning individual figures, or a column or row of figures, should be given in footnotes.

Sample table:

Title: *Monthly Sales Summary*

Prefatory Note: Overview of monthly sales performance for the first quarter.

Month	Summary of sales performance by month for Q1.	
	Sales ($)	Target (%)
Jan	50000	95%
Feb	45000	90%
March	55000	110%

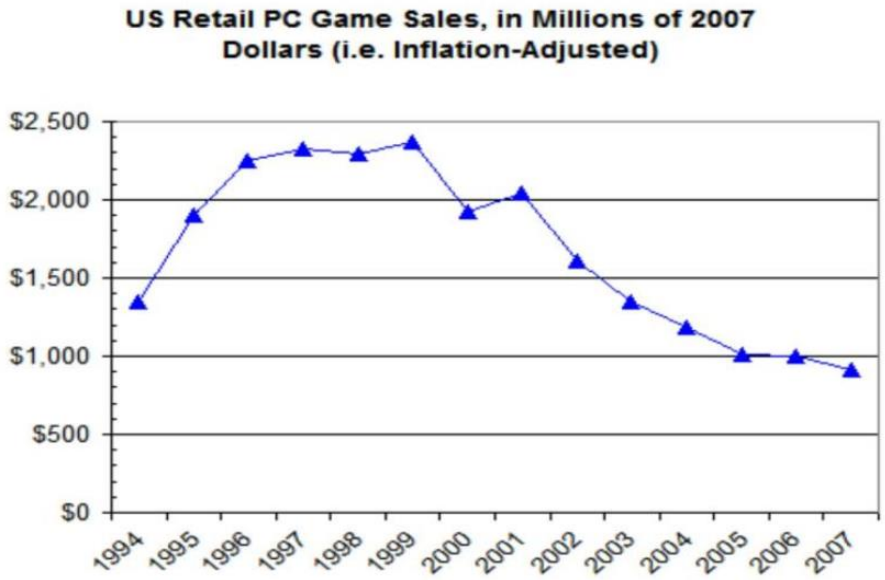
Source: Company Sales Database, 2023.

Footnote: Target percentages reflect the proportion of the goal reached each month.

Graphic or Diagrammatic representation of data:

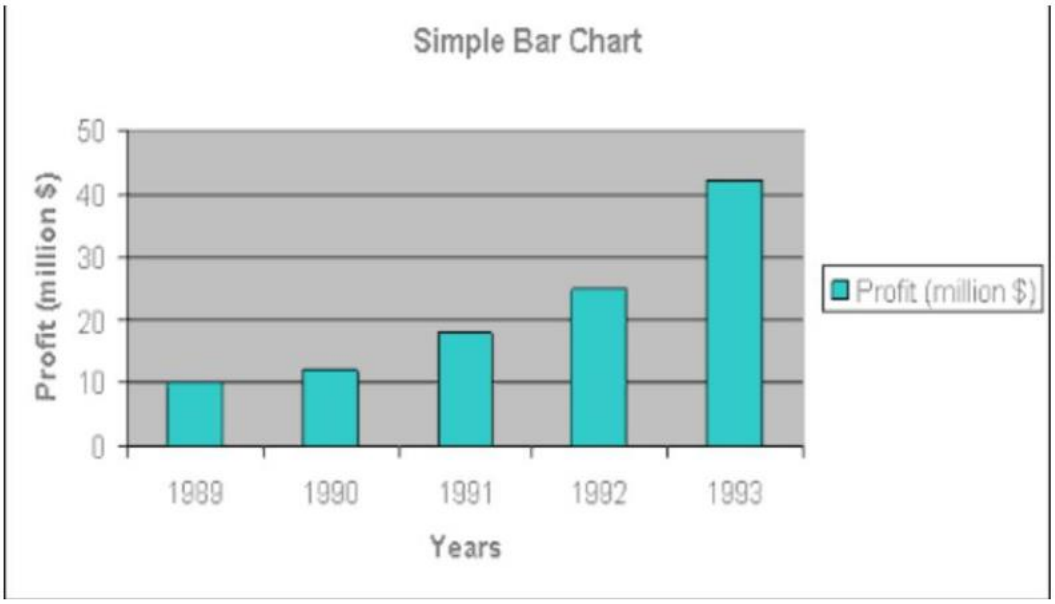
The important types of diagrams which are used in statistical work are being described below.

1. *Line diagram*: When statistical data $\{(x_i, y_i),\ i = 1,\ldots,n\}$ on two variables x and y are plotted in reference to x−axis and y−axis where both the axes are in arithmetic scale, the n pairs given n points on the graph, which are next joined by line segments. The resulting diagram is known as line diagram. Line diagrams are frequently used for picturing time series data.



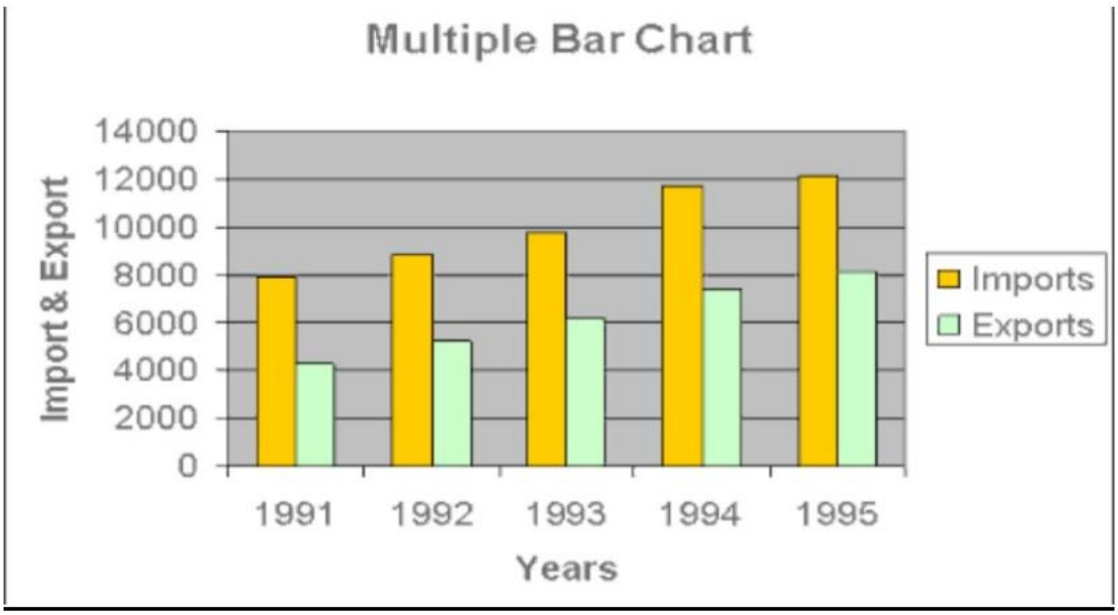
2. *Bar diagrams*: Bar diagrams are the simplest and most used geometric forms for visual representation of data. Bar diagrams are of the following types:

a) *Simple Bar Diagram*: A Bar diagram which consists of a number of rectangles (usually called bars) is used for one dimensional comparison. It is used to show absolute changes in magnitudes overtime(chronological) or space (geographical/regional). Changes in time or space, as the case may be, are shown along the x-axis with equally spaced magnitudes. Rectangles of equal width are drawn with lengths varying with the magnitude represented.



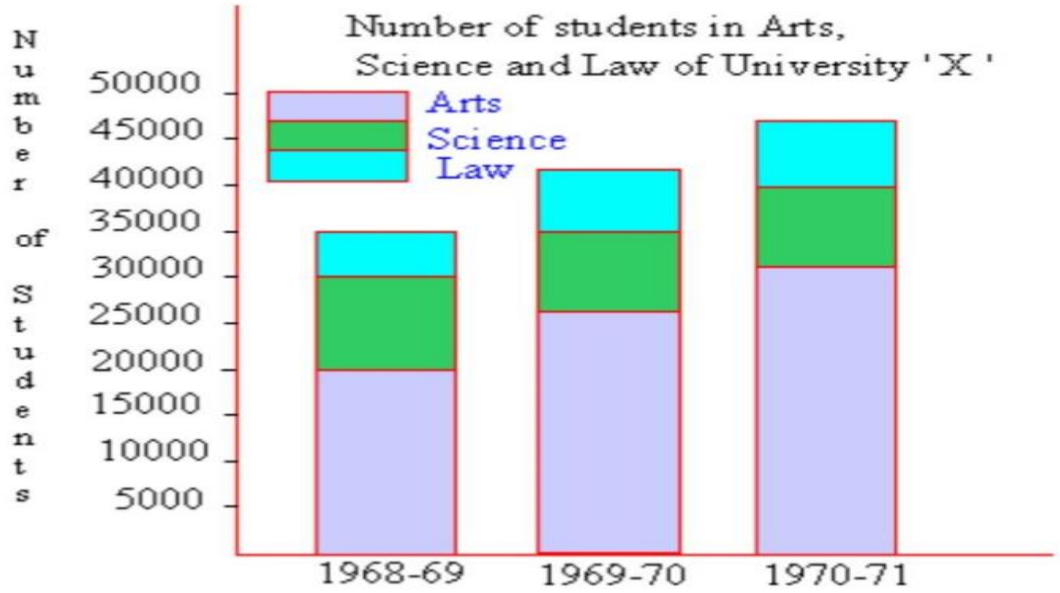
Vertical bars should also be used for data classified quantitatively. When making comparisons of data classified qualitatively or geographically, on the other hand, horizontal bars are generally used.

(b) *Multiple bar diagram*: A multiple bar diagram is used for two- or three-dimensional comparison. For comparison of magnitudes of one variable in two or three aspects, or for comparison of magnitudes of two or three variables, a group of rectangles placed side by side is used. The bars are to be distinguished by shading or colouring to show the variables represented.



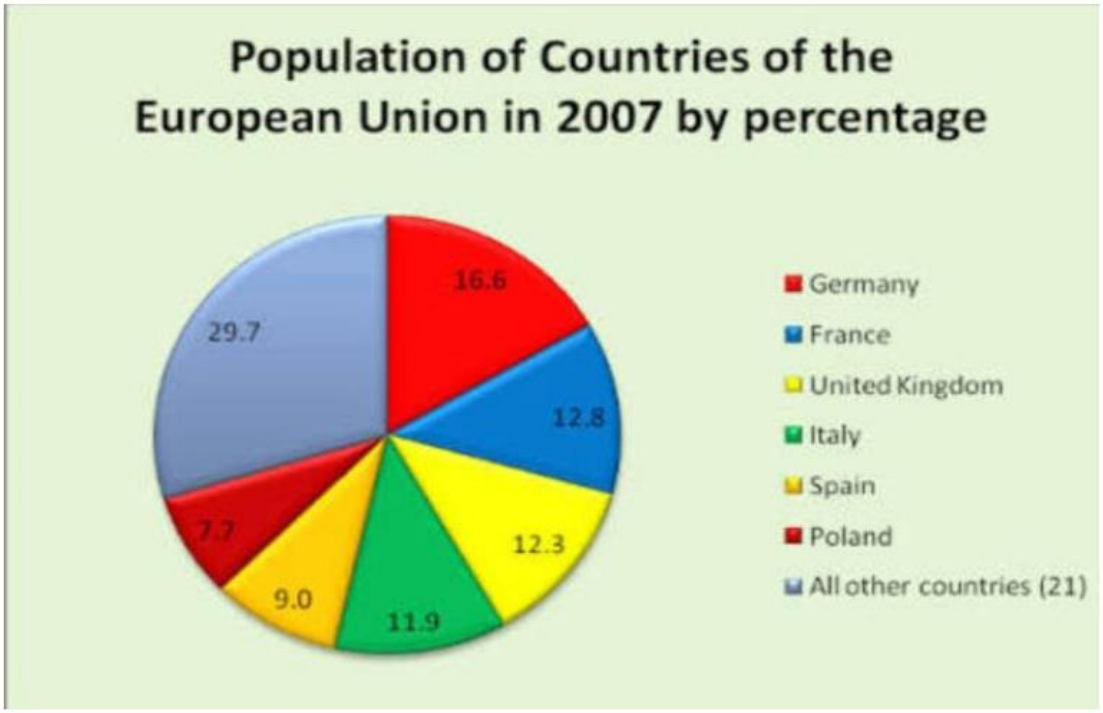
(c) *Sub-divided bar diagram*: The different components of a variable may be shown by subdivided bar diagram. Here as in the case of simple bar diagram, bars are drawn to represent the total magnitudes of the variable; one bar to represent each time period or geographical area. Then each bar is divided into several segments, each segment representing a component of the total. To distinguish between different components, different shading is used and explained in the

body. The various components of the variable are to be represented in the same order in different bars to facilitate easy comparison.



In the subdivided bar diagrams, the heights of the rectangles, drawn is proportional to the magnitudes of the variable.

3. *Pie diagram*: When an aggregate is divided into different components, we may be interested in the relative importance of the different components, rather than their absolute contribution to the aggregate. For representing breakdown of an aggregate into components a pie diagram is used. For pie diagram, one circle is used and the area enclosed by it being taken as 100. It is then divided into a number of sectors by drawing angles at the centre, the area of each sector representing the corresponding percentage. Since the full angle at the center is 360°, it is clear that for any particular category the angle (in degrees) should be 3.6 times the corresponding percentage.



4. *Scatter diagram*: The scatter diagram is the simplest method of studying relationship between two variables. The simplest device for ascertaining whether variables are related is to prepare a dot chart, where the horizontal axis represents one variable and vertical axis representing the other. The diagram so obtained is known as scatter diagram or dot diagram. From the scatter diagram one can have a fairly good idea about the relationship between variables. It is useful for identifying patterns, outliers, and potential correlations between variables.

5. *Histogram*: For a given grouped frequency distribution, we first mark off along the x-axis all the class-interval on a suitable scale. With the class-intervals a bases we draw rectangles with areas proportional to the frequencies of the class intervals. For equal class intervals, the heights of the rectangles will be proportional to the frequencies, while for unequal class intervals, the heights will be equal (or proportional) to the frequency densities of the classes.