GRAPHICAL REPRESENTATION
OF
STATISTICAL DATA

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PRESENTATION OF DATA

This refers to the organization of data into tables, graphs or charts, so that logical and statistical conclusions can be derived from the collected measurements.

Data may be presented in(3 Methods):
- Textual
- Tabular or
- Graphical.

INTRODUCTION

A Graphical representation is a visual display of data and statistical results. it is more often and effective than presenting data in tabular form. There are different types of graphical representation and which is used depends on the nature of the data and the nature of the statistical results.

Graphical representation is the visual display of data using plots and charts. it is used in many academic and professional disciplines but most widely so in the field of mathamatics,medicine and the science.

Graphical representation helps to quantify, sort and present data in a method that is understandable to a large variety of audience.

Several types of mediums are used for expressing graphics, including plots, charts and diagrams.

In mathematics line and dot plots are especially valuable for displaying information.

Line plots which are number lines with the letter "X" placed above numbers to show their freequency,are used to represent numerical data.

BAR DIAGRAM

DEFINITION:

"*A graph showing the differences in frequencies or percentages among the categories of a nominal or an ordinal variable. The categories are displayed as rectangles of equal width with their height proportional to the frequency or percentage of the category.*"

1. BAR DIAGRAMS

A Bar graph is a chart with rectangular bars with length proportional to the values that they represent. The bars can be plotted vertically or horizontally.

One axis of the chart shows the specific categories being compared, and the other axis represents discrete values.

A bar graph will have two axes. One axis will describe the types of categories being compared and the other will have numerical values that represent the values of the data.

There are many different types of bar graphs. each type will work best with a different type of comparison. □

Simple bar diagram: It represent only one variable. for example sales,prodution,population figures etc..These are in same width and vary only in heights.It becomes very easy for readers to study the relationship.It is the most popular in practice.

Sub divided bar diagram:While constructing such a diagram the various components in each bar should be kept in the same order.The components are shown with different shades or colours with a proper index.

Multiple bar diagram: This method can be used for data which is made up of two or more components. In this method the components are are shown as separate adjoining bars. The components are shown by different shades and colours.

Deviation bar diagram:Diviation bars are used to represent net quantities- excess or deficit, for example net profit, net loss,etc.it have negative and positive values.

BAR DIAGRAM-BIRTH RATES OF COUNTRIES IN PERTICULAR PERIOD OF TIME

Country	Birth rate
India	33
Germany	15
UK	20
China	40
New Zeeland	30
Sweden	15
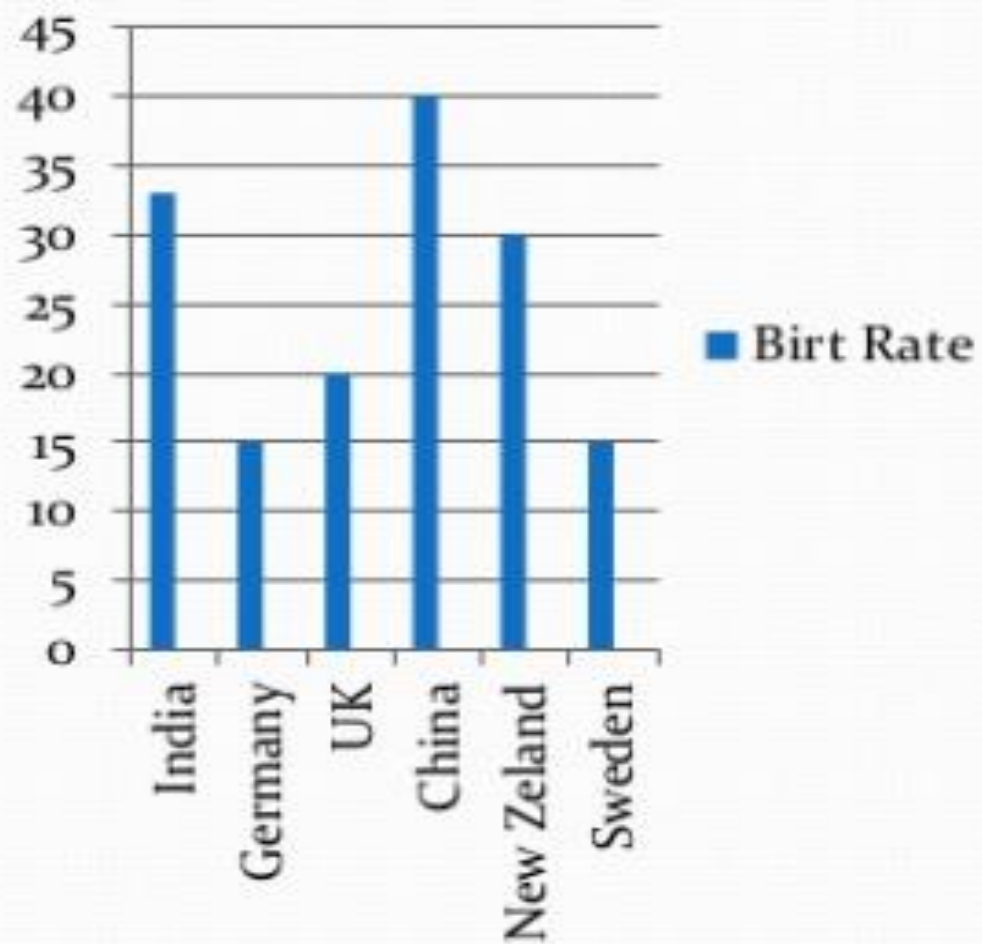
LINE DIAGRAM

DEFINITION:

"A graph showing the differences in frequencies or percentages among categories of an interval-ratio variable. Points representing the frequencies of each category are placed above the midpoint of the category and are joined by a straight line."

2. LINE DIAGRAM DEFINITION:

"A graph showing the differences in frequencies or percentages among categories of an interval-ratio variable. Points representing the frequencies of each category are placed above the midpoint of the category and are joined by a straight line."

 "Graphs represented by line segments may be considered as line graphs". Line graph is a graph that uses line segments to connect data points and shows changes in data over time.

 In these diagrams only lines are drawn for the purpose of comparison.

 They are not thick and generally their number is sufficiently large so that thickness of bars can not been used.

It is a type of chart which displays information as a series data points called markers connected by strait line segments.

A Line chart is often used to visualize a trend in data over intervals of time-a time series thus the line is often drawn chronologically.

 In Line graph Y axis represent frequency and X axis represent time or period.

Line graph are usually drawn to represent the time series data. E.g. Temparature,Rain fall, Population growth,Birthrates etc.

RULES FOR LINE GRAPH: • Y Axis should be shorter than X axis. • Start the Y axis with Zero • Determine the range of values needed. • Select an Interval size.
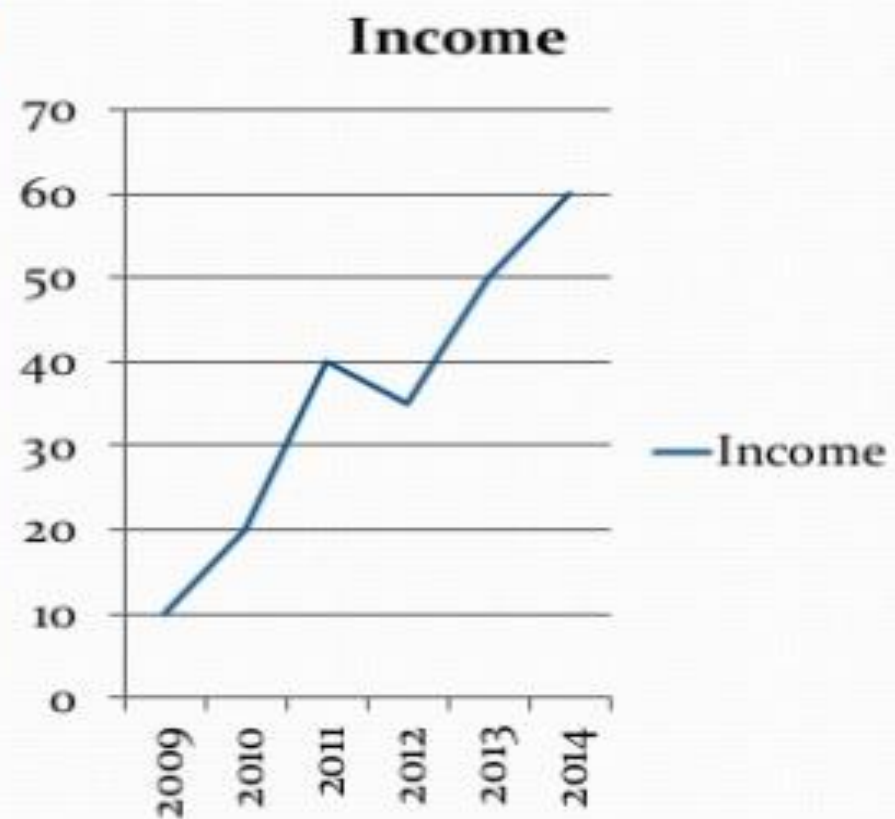
LINE GRAPH BIRTHRATES IN VARIOUS COUNTRIES

Country	Birth rate
India	30
Germany	15
UK	20
China	40
Newzeland	30
Sweden	15

Birth Rate
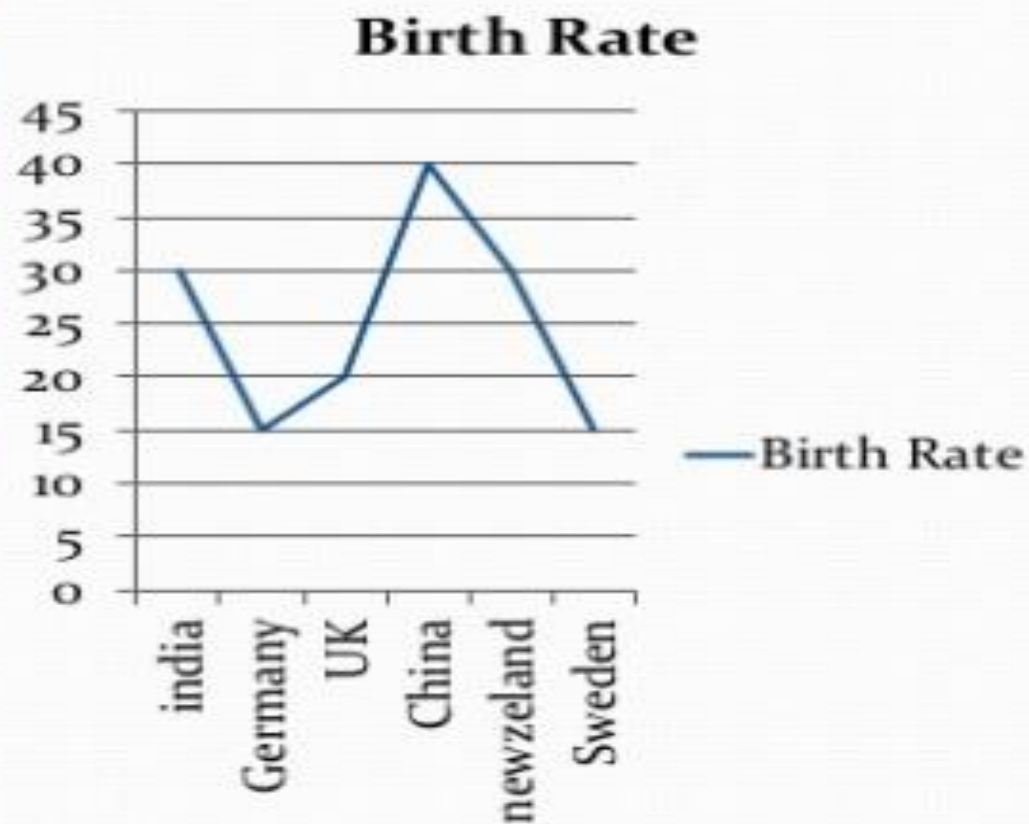
Income of a family in particular years

Year	Income($)
2009	10
2010	20
2011	40
2012	35
2013	50
2014	60

Income

3. HISTOGRAM DEFINITION:

"A graph showing the differences in frequencies or percentages among the categories of an interval-ratio variable.

The categories are displayed as contiguous bars, with width proportional to the width of the category and height proportional to the frequency or percentage of that category".

Histogram is representation of a frequency distribution by means of rectangles.

Width of bars represent class intervals and height represents corresponding frequency.

**Histograms** are diagrams of frequency distribution for continues data.

They Represent frequencies by areas and it is useful in further analysis.

It is some times difficult to draw reasonable histogram.

'Histogram was first introduced by Karl Pearson in 1891'. Histogram is similar to bar charts but the histogram groups numbers into ranges and you decide what ranges to use.

HISTOGRAM

Histogram
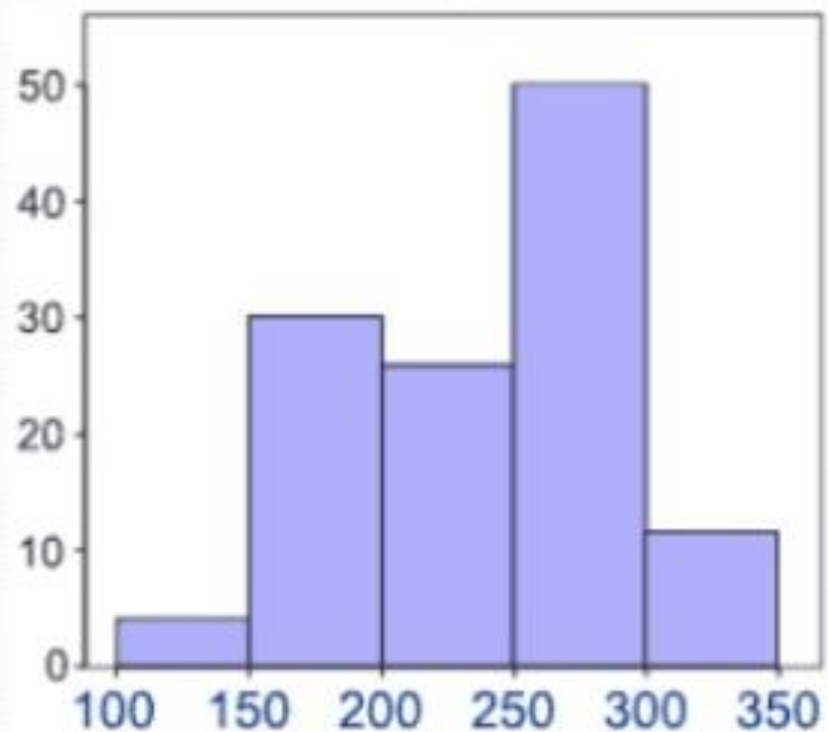
Table

Income	Employees
100-150	5
150-200	30
200-250	25
250-300	50
300-350	10

PIE DIAGRAM

DEFINITION:

' A pie chart shows the differences in frequencies or percentages among the categories of a nominal or an ordinal variable. The categories are displayed as segments of a circle whose pieces add up to 100% of the total frequencies'.

4. **The Pie Chart** is a commonly used graphical device for presenting relative frequency distribution for qualitative data.

* First draw a circle then use the relative frequencies to subdivide the circle into sectors that correspondent to the relative frequency for each class.

* Pie Chart is a circular(360 degree) Graphical representation.

 * Compares sub classes or categories to the whole class or categories using differently coloured or patterned segments.

* It is drawn to depict the total volume of the given attribute using a circle, dividing the circle into corresponding degrees of angles then represent the sub sets of the data.

 Hence it is also called divided circle diagram.

BIRT RATES IN COUNTRIES- PIE DIAGRAM

Table

Country	
India	30
Germany	15
UK	20
China	40
Newzeland	30
Sweden	15

Pie diagram

Birth Rate

- India
- Germany
- UK
- China
- Newzeland

5. A pictogram is a chart that uses pictures to represent data. Pictograms are set out in the same way as [bar charts](), but instead of bars they use columns of pictures to show the numbers involved.

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FRUIT	NUMBER OF CHILDREN WHO CHOSE IT
PEAR	
WATERMELON	
ORANGE	
APPLE	
BANANA	

GENERAL RULES DISPLAYING DATA

- **Simpler is Better**

- **Graphs, Tables and charts can be used together**

- **Use clear Description, title and labels.**

- **Provide a narrative Description of the highlights.**

- **Don't Compare variables with different scales of magnitude.**

- **A Diagram must be attractive, well propotioned,neat and pleasing to the eyes.**

- **They should be geometrically Accurate.**

- **Size of the diagram should be proportional to paper.should not be too big or too small.**

- **Different colours should be used to classify datas.**

CONCLUSION

- Graphical forms makes it possible to easily draw visual impression of data

- Graphical representation of data enhances our understandings.

- It makes comparisons easily.

- This kind of method create an imprint on mind for a long period of time.