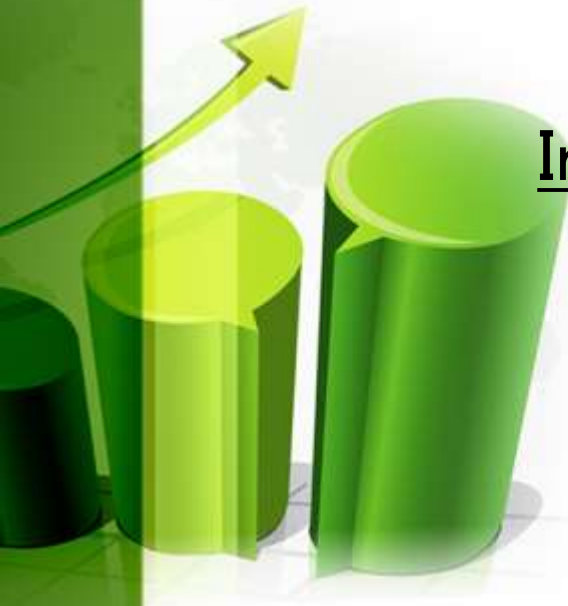# Introduction To Statistics

Graphical Representation

INTRODUCTION TO STATISTICS

In the modern world of computers and information technology, the importance of statistics is very well recognized by all the disciplines. Statistics has applications in Agriculture, Economics, Commerce, Biology, Medicine, Industry, planning, education and so on.

STATISTICS

Meaning of Statistics:

Statistics is concerned with scientific methods for collecting, organizing, summarizing, presenting and analyzing data as well as deriving valid conclusions and making reasonable decisions on the basis of this analysis..

The word 'statistic' is used to refer to

1. <u>Numerical facts, such as the number of people living in particular area.</u>

2. <u>The study of ways of collecting, analyzing and interpreting the facts.</u>

❑ The science of collectiong, organizing, presenting, analyzing, and interpreting data to assist in making more effective decisions

❑ Statistical analysis – used to manipulate summarize, and investigate data, so that useful decision-making information results.

TYPES OF STATISTICS

❑INFERENTIAL STATISTICS

❑DISCRIPTIVE STATISTICS

INFERENTIAL STATISTICS

Branch deals with procedure for making inferences about the characteristics that describe the large group of data called population

Descriptive statistics

Branch of statistics which deals with concepts and methods concern with summarization and description of the important aspects of numerical data. This area of study includes graphical display of data and the computation of information about centre of data.
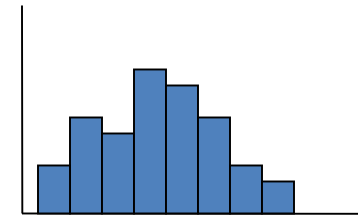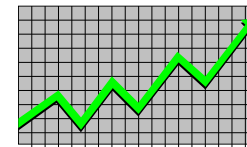
Descriptive Statistics

- ## Collect data

  - ### e.g., Survey

- ## Present data

  - ### e.g., Tables and graphs

- ## Summarize data

  - ### e.g., Sample mean = $\dfrac{\sum X_i}{n}$

Variables

- A **variable** is a characteristic or condition that can change or take on different values.

- Most research begins with a general question about the relationship between two variables for a specific group of individuals.

Types of Variables

- Variables can be classified as

- **Discrete variables** (such as class size) consist of indivisible categories.

- **continuous variables** (such as time or weight) are infinitely divisible into whatever units a researcher may choose. For example, time can be measured to the nearest minute, second, half-second, etc.

Data

Statistical data are usually obtained by counting or measuring items. Most data can be put into the following categories:

- **Qualitative -** data are measurements that each fail into one of several categories. (hair color, ethnic groups and other attributes of the population)

- **quantitative** - data are observations that are measured on a numerical scale (distance traveled to college, number of children in a family, etc.)
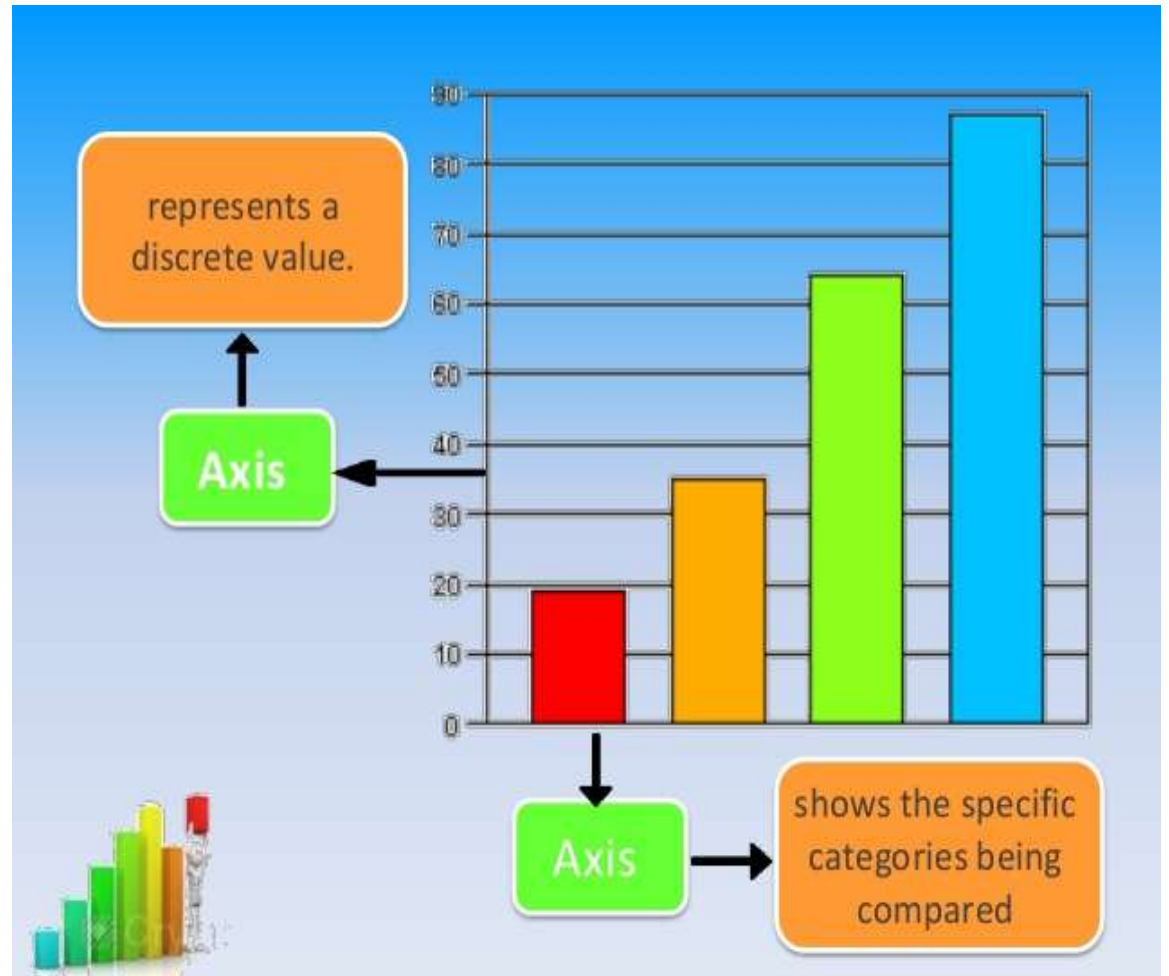
GRAPHICAL REPRESENTATION

THE VISUAL DISPLAY OF STATISTICA DATA IN THE FORM OF POINTS, LINES, AREAS AND OTHER GEMETRICAL FORMS AND SYMBOLS, IS IN THE MOST GENRAL TERMS KNOWN AS GRAPHICAL REPRESENTATION.
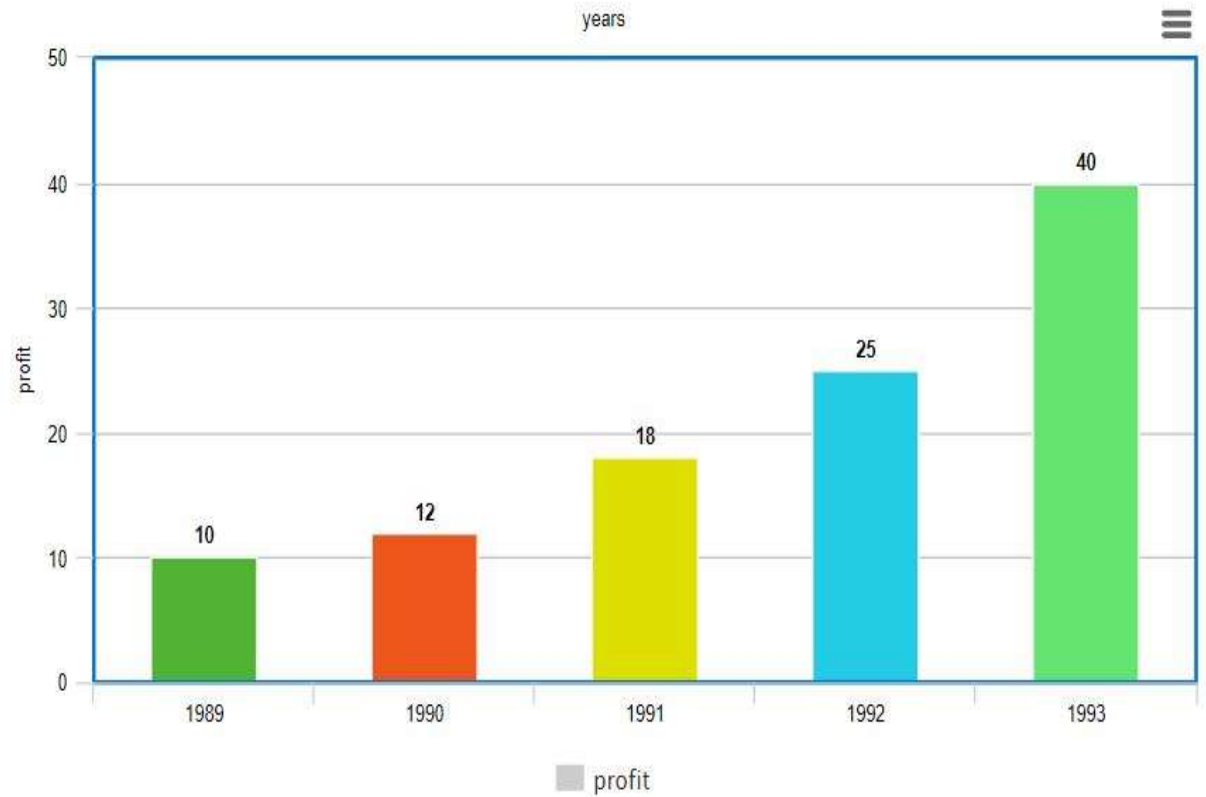
BAR GRAPH

A bar graph is a chart that uses either horizontal or vertical bars to show comparisons among categories.

READING BAR GRAPH

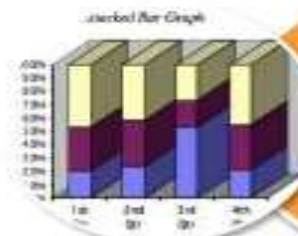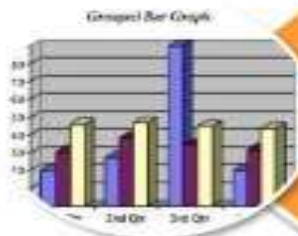# A simple bar graph to display profit a bank for 5 years:
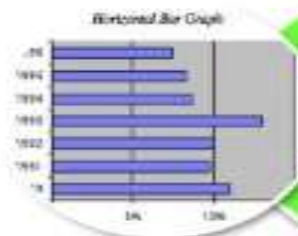
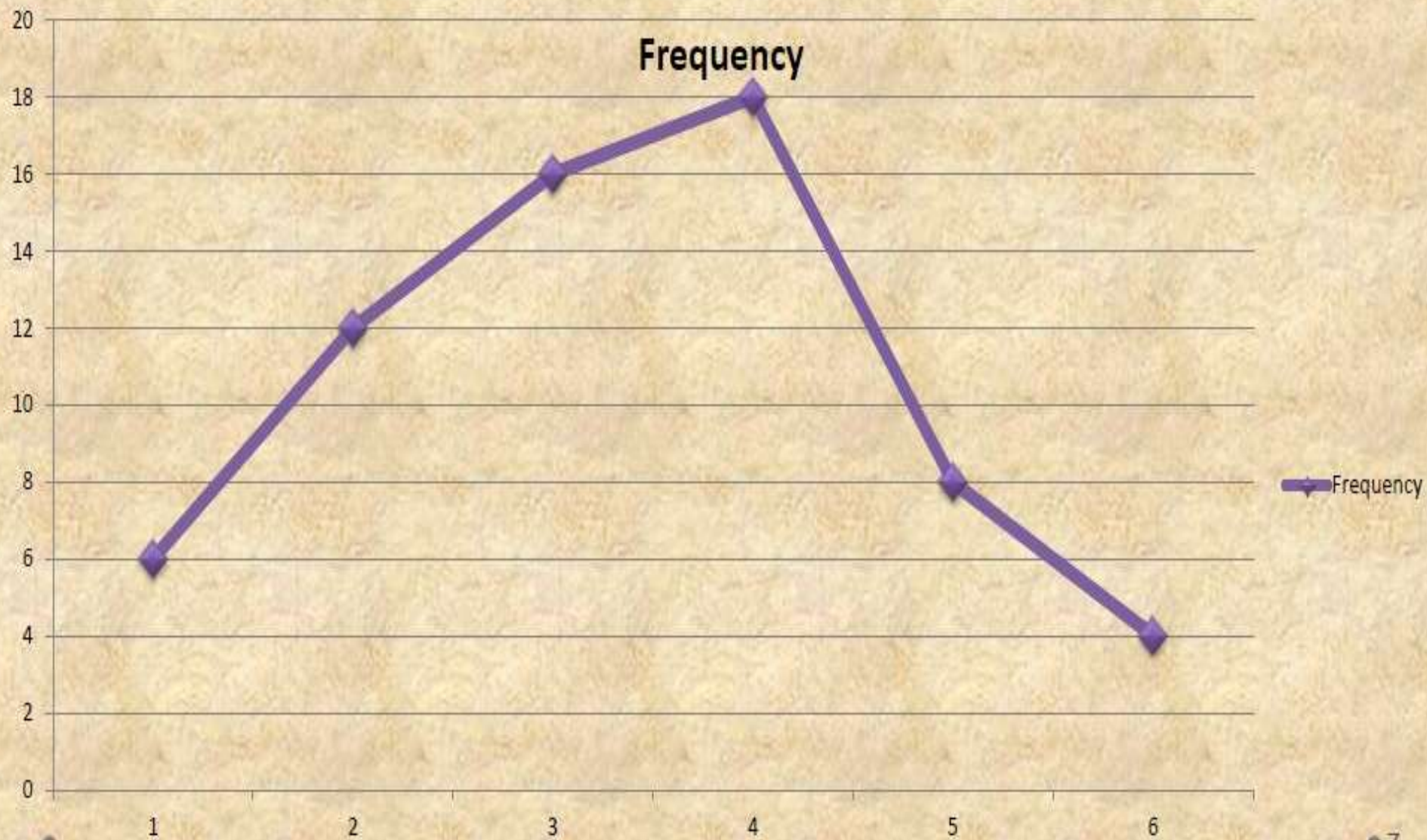# Types of Bar Graphs

Single (vertical)

Stacked

Grouped

Horizontal

LINE DIAGRAM

A graph that shows information that is connected in some way（such as change over time). Line graph represent data or information in the form of dots, and these dots shows like a line in the particular graph.

| Classes	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	6	12	16	18	8	4

Frequency

PIE DIAGRAM

Pie diagram is a circular diagram where the whole circle represents a total and the components of the total are represented by sectors of the pie diagram. Pie diagram is also called sector diagram.

Example (Pie Chart)

The Chart below shows the percentage of usage of different browser in Europe. In this chart 37.9% of people in Europe use Firefox and 15.5% of people use chrome, vice versa.
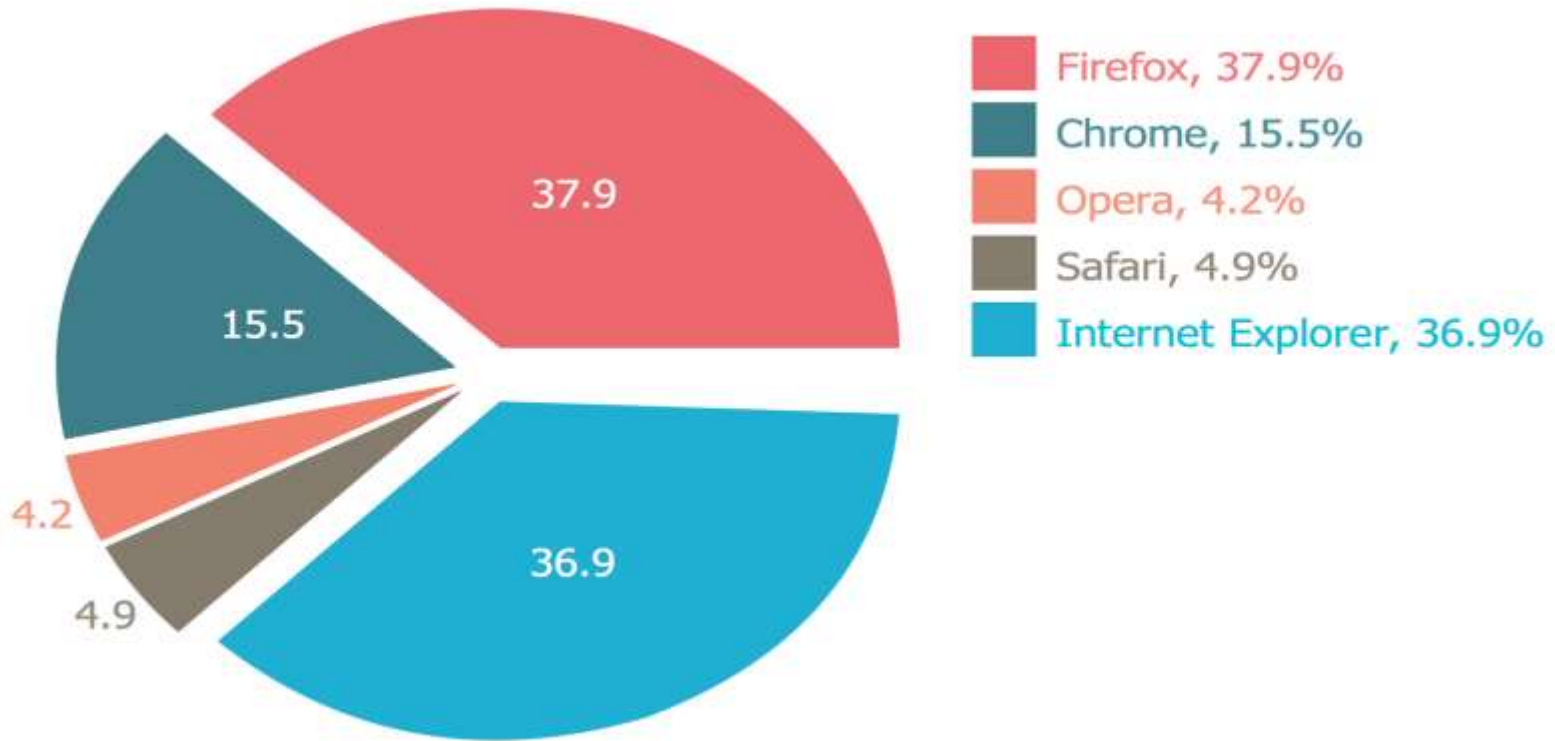
PICTOGRAM

A pictogram is a popular device for portraying the statistical data by means of pictures or small symbols.

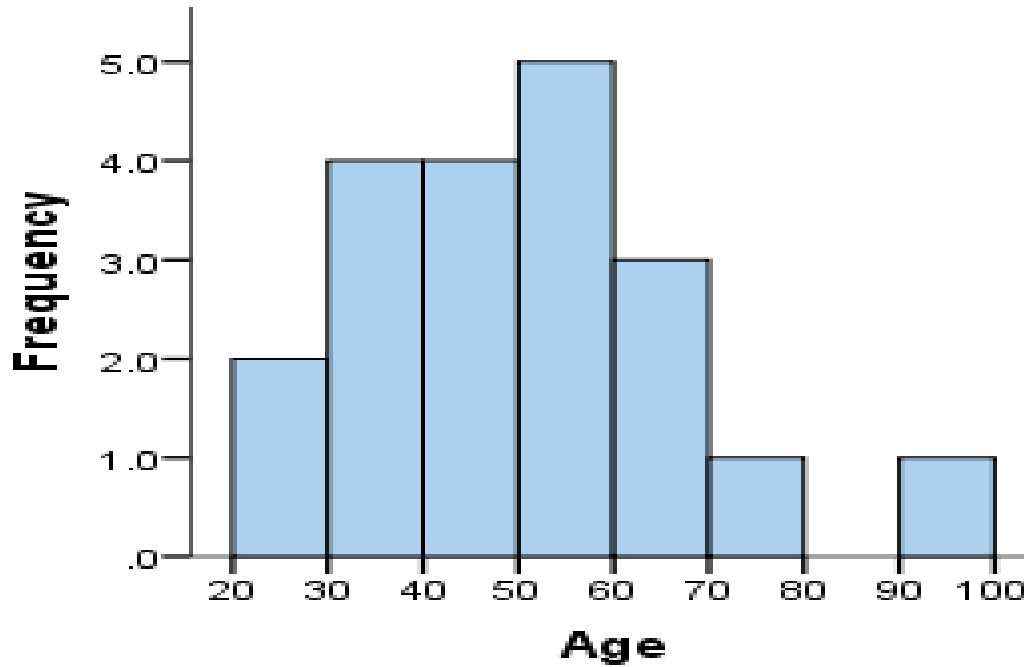|	
Monday	🧁🧁🧁🧁🧁
Tuesday	🧁🧁🧁
Wednesday	🧁🧁🧁🧁
Thursday	🧁🧁🧁🧁
Friday	🧁🧁🧁🧁🧁🧁🧁
Saturday	🧁🧁🧁🧁🧁🧁🧁🧁🧁🧁
Sunday	🧁🧁🧁🧁🧁🧁🧁🧁🧁

🧁 = 6 cupcakes

HISTOGRAM

A histogram consists of a set of adjacent rectangles whose bases are marked off by class boundaries (not class limits) on the X- axis and whose heights are proportional to the frequencies associated with respective classes.

Example
(Histogram)

| 36 | 25 | 38 | 46 | 55 | 68 | 72 | 55 | 36 | 38 |
| 67 | 45 | 22 | 48 | 91 | 46 | 52 | 61 | 58 | 55 |