Data Presentation in Biostatistics

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Lecturer
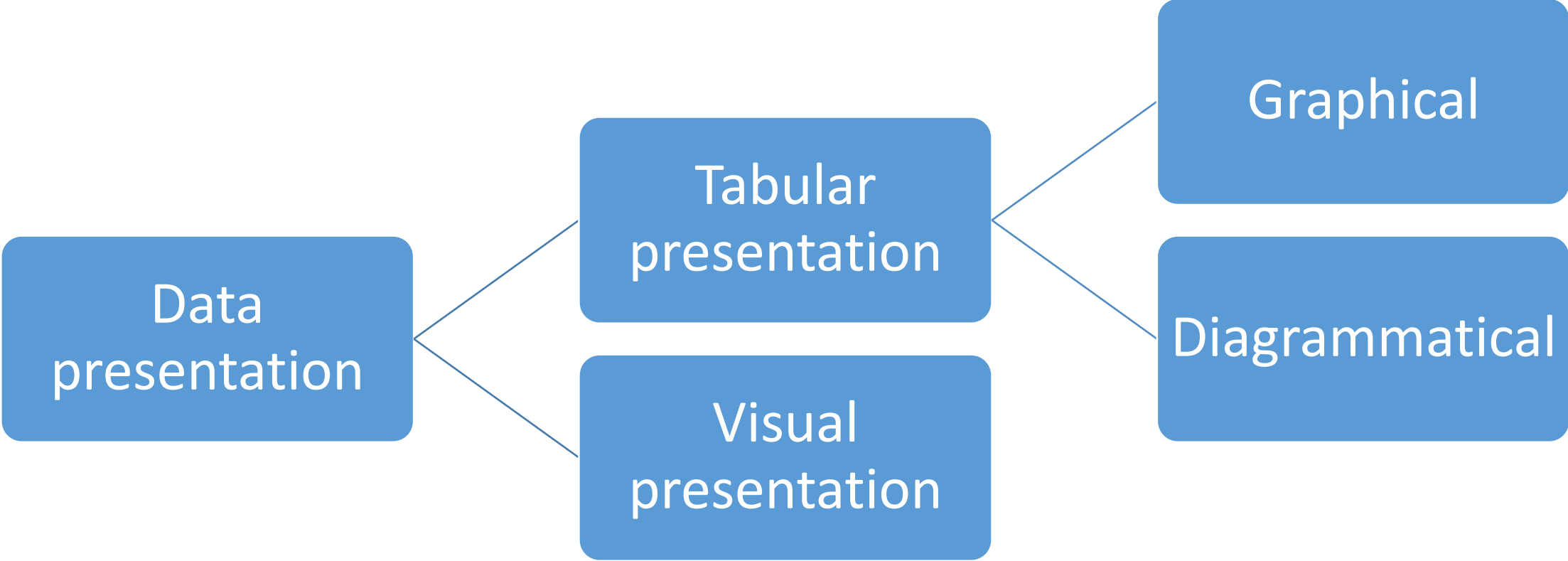
Dept of NFE, DIU

Presentation of Data

- Method by which the people organize, summarize and communicate information using a variety of tools such as tables, graphs and diagrams.
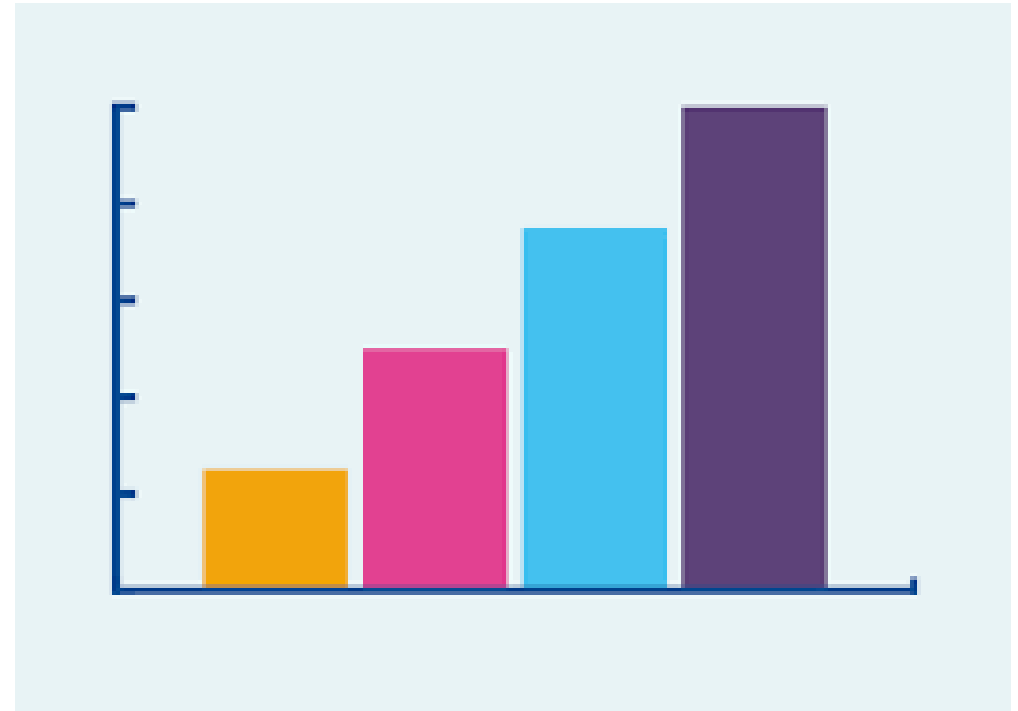
Types of data presentation

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                                              ┌──────────────┐
                                              │  Graphical   │
                         ┌──────────────┐     └──────────────┘
                         │   Tabular    │
┌──────────────┐         │ presentation │     ┌──────────────┐
│     Data     │─────────┤              ├─────│Diagrammatical│
│ presentation │         └──────────────┘     └──────────────┘
│              │
└──────────────┘         ┌──────────────┐
                         │    Visual    │
                         │ presentation │
                         └──────────────┘
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Uses of presentation

- Easy and better understanding of the subject
- Provides first hand information about data
- Helpful in future analysis
- Easy for making comparisons
- Very effective

Principles of presentation

- Data should be presented in simple form
- Arose interest in reader
- Should be concise but without losing important details
- Facilitate further statistical analysis
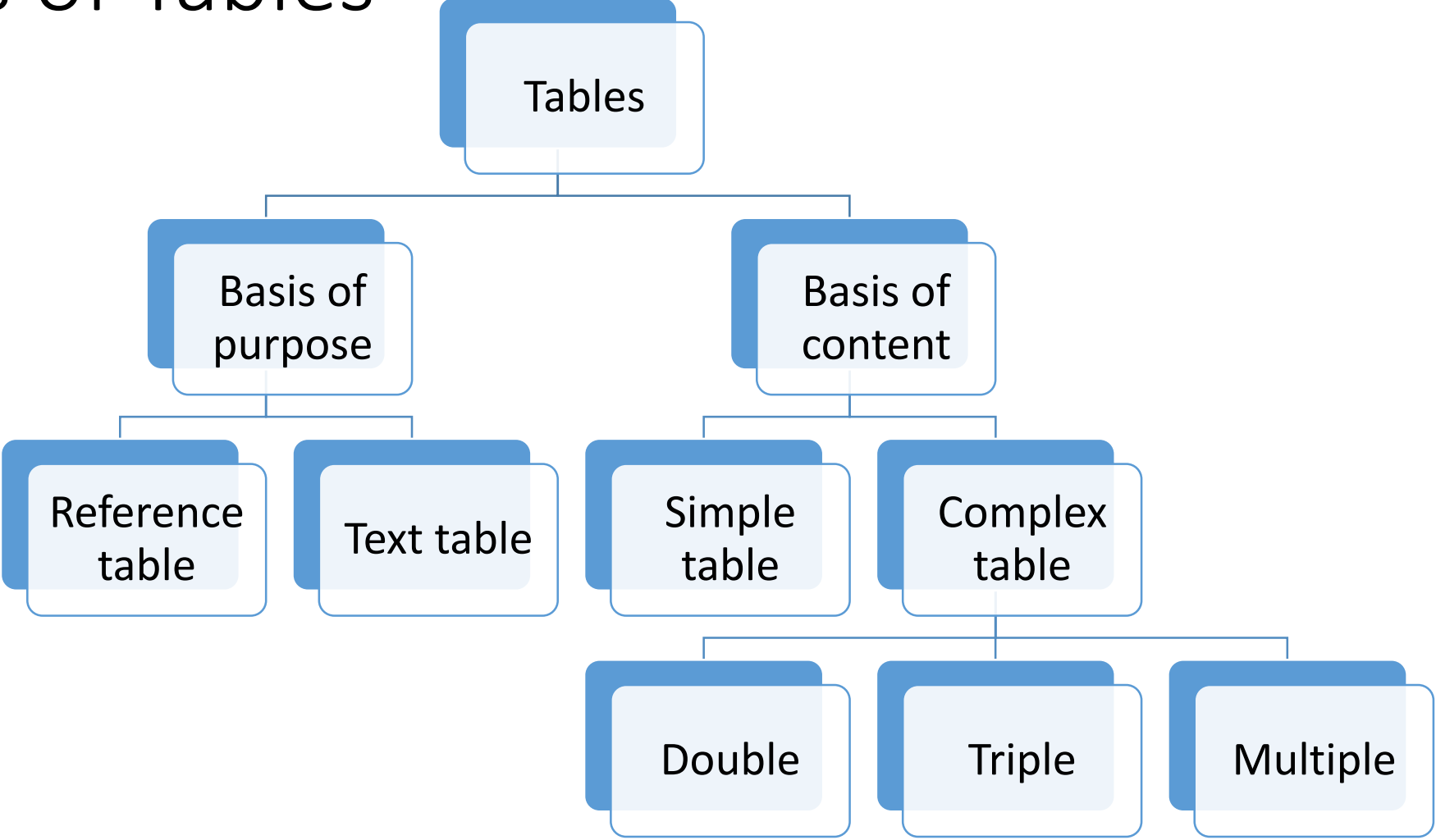- Define problem and should suggest its solution

Tabulation

- It's a systematic and logical arrangement of classical data in rows and columns.

Pulse rate(bpm)		frequency
50-59		4
60-69		2
70-79		4
80-89		5
90-99		5
Total		**20**

Significance of tabulation

- Simplifies complex data

- Unnecessary details and repetitions of data avoided in tabulation

- Facilitates comparison

- Gives identity to data

- Reveals pattern with in the figures which cannot be seen in the narrative form

Types of Tables

```
                        ┌──────────┐
                        │  Tables  │
                        └──────────┘
              ┌────────────────┴────────────────┐
        ┌──────────┐                      ┌──────────┐
        │ Basis of │                      │ Basis of │
        │ purpose  │                      │ content  │
        └──────────┘                      └──────────┘
       ┌──────┴──────┐                 ┌──────────┴──────────┐
 ┌───────────┐  ┌──────────┐    ┌──────────┐         ┌──────────┐
 │ Reference │  │   Text   │    │  Simple  │         │ Complex  │
 │   table   │  │  table   │    │  table   │         │  table   │
 └───────────┘  └──────────┘    └──────────┘         └──────────┘
                                          ┌──────────────┼──────────────┐
                                     ┌──────────┐  ┌──────────┐  ┌──────────┐
                                     │  Double  │  │  Triple  │  │ Multiple │
                                     └──────────┘  └──────────┘  └──────────┘
```

Reference table

- These tables present the original data for reference purposes
- It contains only absolute and actual figure and round numbers or percentages

Table 2.

States with the Fastest and Slowest Growth in Resident Population: 2010 to 2020

State	Population		Change	
	2010	2020	Number	Percent
Fastest Growing				
Utah	2,763,885	3,271,616	507,731	18.4
Idaho	1,567,582	1,839,106	271,524	17.3
Texas	25,145,561	29,145,505	3,999,944	15.9
North Dakota	672,591	779,094	106,503	15.8
Nevada	2,700,551	3,104,614	404,063	15.0
Slowest Growing				
Connecticut	3,574,097	3,605,944	31,847	0.9
Michigan	9,883,640	10,077,331	193,691	2.0
Ohio	11,536,504	11,799,448	262,944	2.3
Wyoming	563,626	576,851	13,225	2.3
Pennsylvania	12,702,379	13,002,700	300,321	2.4

Source: U.S. Census Bureau, 2020 Census and 2010 Census

Text tables

- Constructed to present selected data from one or more general purpose tables

- It brings out a specific point of answer to specific question

- It includes ratios, percentage, averages etc.

- It should be found in the body of the text.

Columns stores a specific data type

Row
Or record

Emp No	Name	Age	Department	Salary
001	Alex S	26	Store	5000
002	Golith K	32	Marketing	5600
003	Rabin R	31	Marketing	5600
004	Jons	26	Security	5100

Simple and Double table

Simple tables –
Data relating to only one characteristics

Gender	No of students
Boys	9
Girls	29

Double table -
Data relating to only 2 characteristics

Gender	Food habit	
	Vegetarians	Non Vegetarians
Boys	2	7
Girls	5	24

Triple table:

Data relating to only 3 characteristics

Gender	Food habit			
	Vegetarians		Non Vegetarians	
	Age below 20 years	Age 20 & above years	Age below 20 years	Age 20 & above years
Boys	0	2	1	6
Girls	1	4	10	14

Multiple table:

Gender		Food habit			
		Vegetarians		Non Vegetarians	
		Age <20 years	Age >=20 years	Age < 20 years	Age>= 20 years
Boys	Day scholars	0	0	1	4
	Hostellers	0	2	0	2
Girls	Day scholars	0	1	2	2
	Hostellers	1	3	8	12

← Age

Residing Area

Graphs and Diagrams

Difference between Graph & diagram

Graph	Diagram
Graph paper is used to draw graph	Plain paper is used
Graph represents mathematical relationships between two variables	Diagram does not
Graphs are more appropriate to represent frequency distributions and time series	Diagrams are not at all used for representing frequency distributions
Diagrams do not add anything to the meaning of the data, they are not helpful in analysis of data	Graphs are very much used by the statistitians

Presentation of data

Graphs:

- Histograms

- Frequency curve

- Polygon

- Ogives

- Line graph

Diagrams:

- Bar diagram

- Pie diagram

Histogram

- Represented by a set of rectangular bars

- Variables is taken along the X-axis and frequency along the Y-axis

- The set of rectangular bars so obtained gives histogram
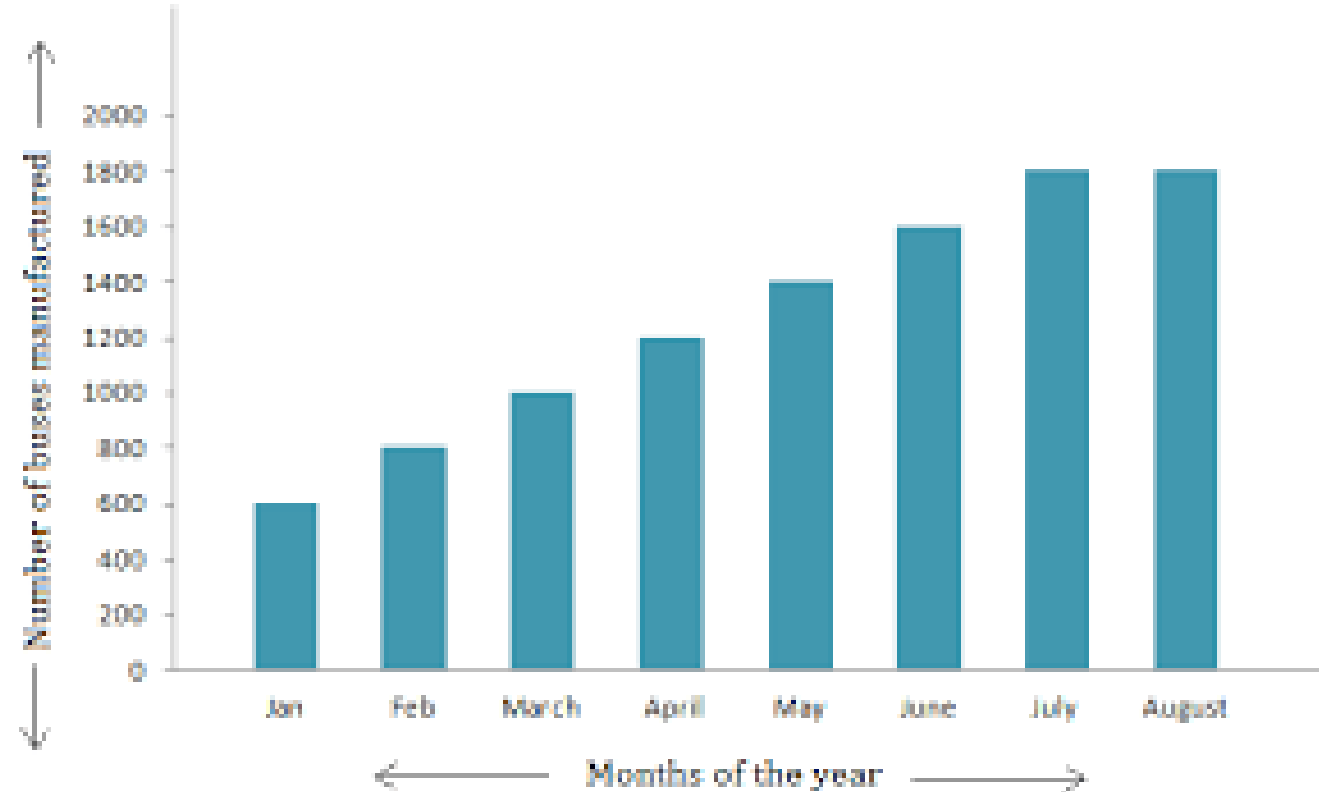
Frequency curve

- Variables is taken along the X-axis and frequencies along Y-axis

- Frequencies are plotted against the class mid-values and then these points are joined by a smooth curve

- Total area under the frequency curve represents total frequency

Frequency Polygon Graph
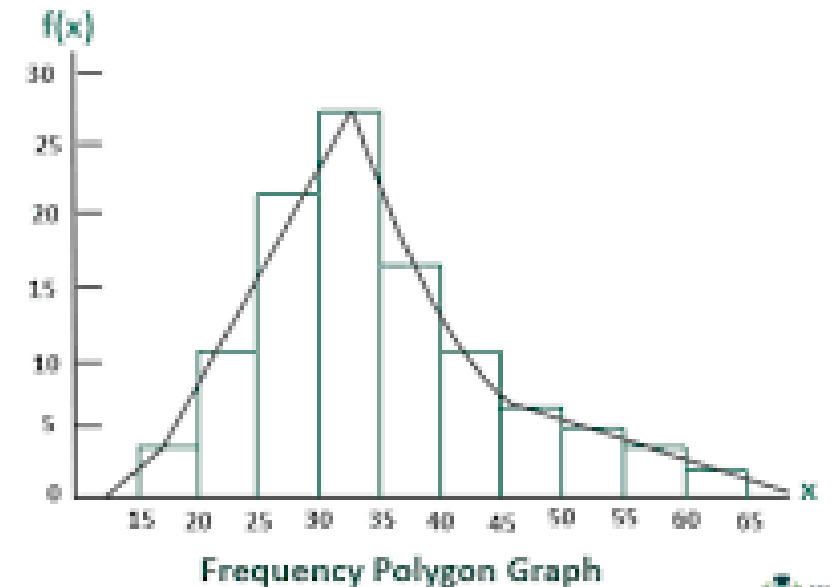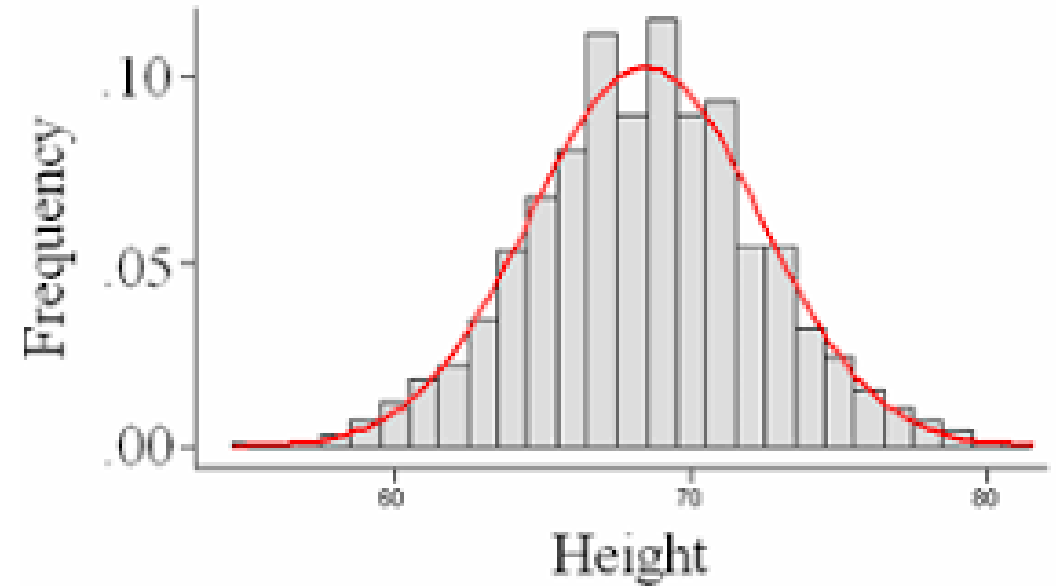
Ogives (Cumulative frequency curve

- It is a smooth graph with cumulative frequency plotted against values of variables
- Class limits are taken along X-axis and CF along Y-axis
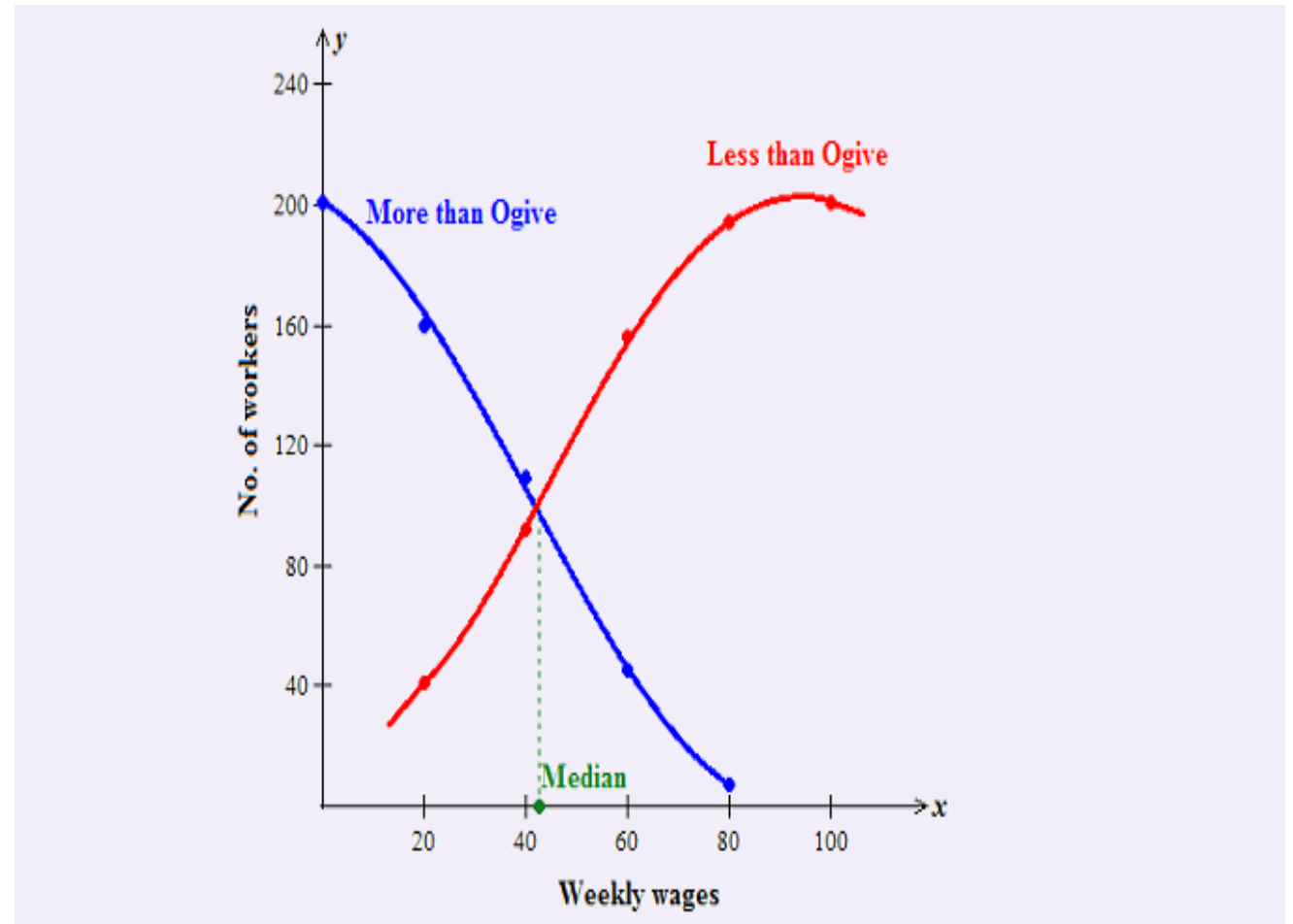
Line graphs

- Line graphs are used to display the comparison between two variables which are plotted on the X-axis and Y-axis

- The X-axis represents measures of time, while the Y-axis represents percentage or measures of quantity

- Line graphs displays a change in direction

- It shows trend of an event occurring over a period of time to know whether it is increased or decreased.
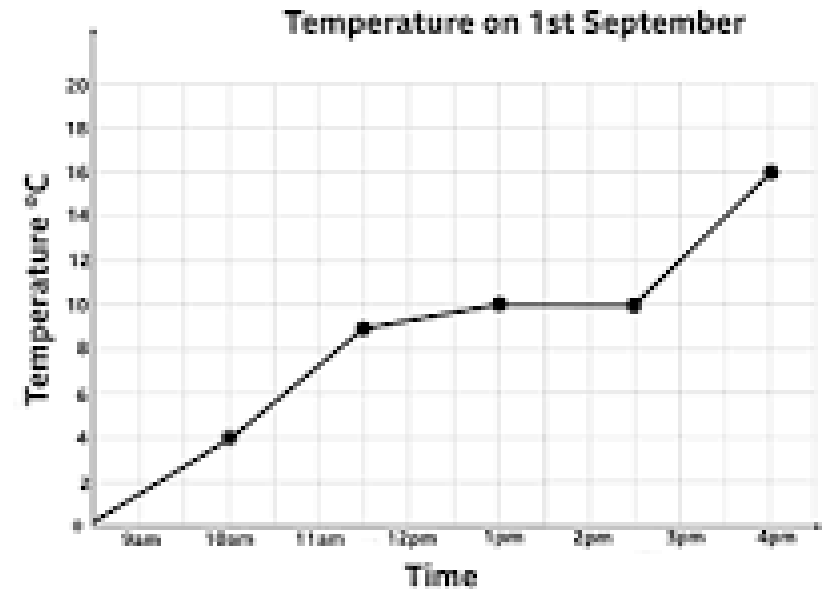
Pie diagram

- Presenting discrete data of qualitative characteristics such as blood groups, Age group, causes of mortality etc.

- The frequencies of the groups are shown in a circle

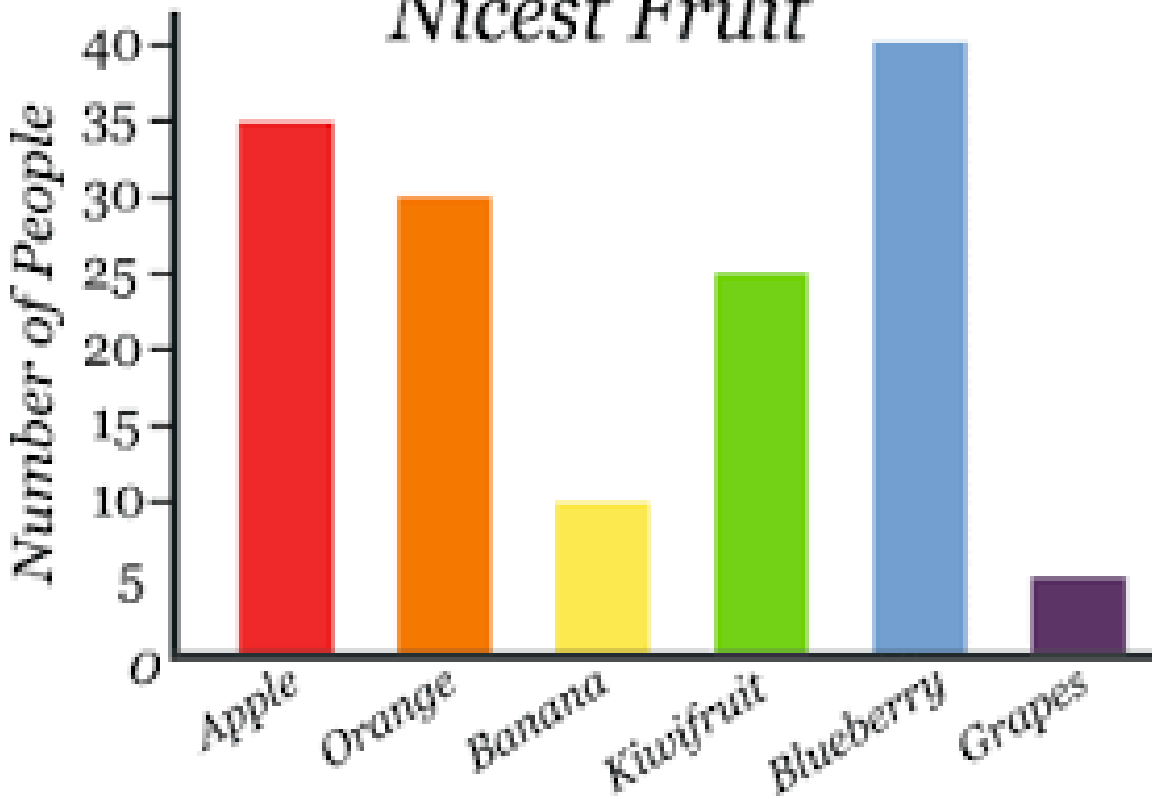- Degrees of angle denote the frequency and area of the sector

Favorite Type of Movie

SciFi: 4 (20%)

Comedy: 4 (20%)

Drama: 1 (5%)

Action: 5 (25%)

Romance: 6 (30%)
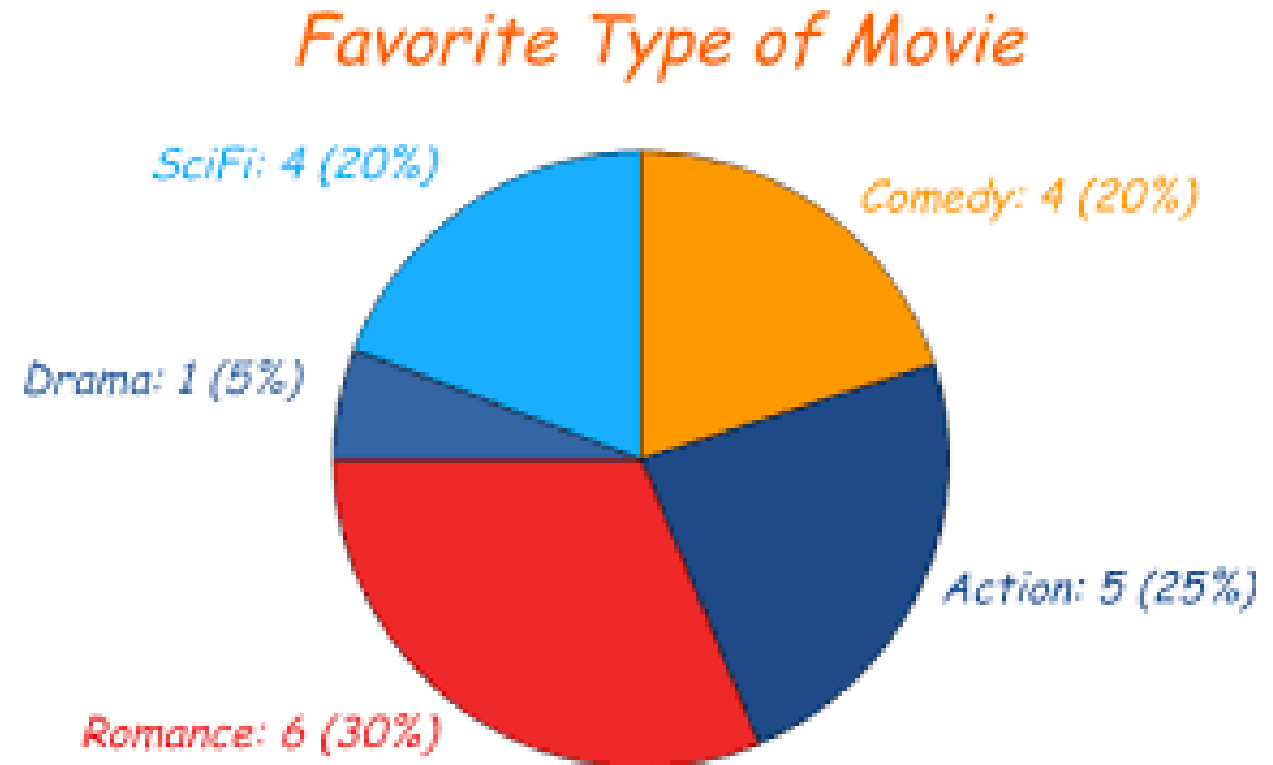
Bar chart/bar diagram

- Bar diagram consists of a series of rectangular bars of equal width

- The bars stand on common base line with equal gap between one bar and another
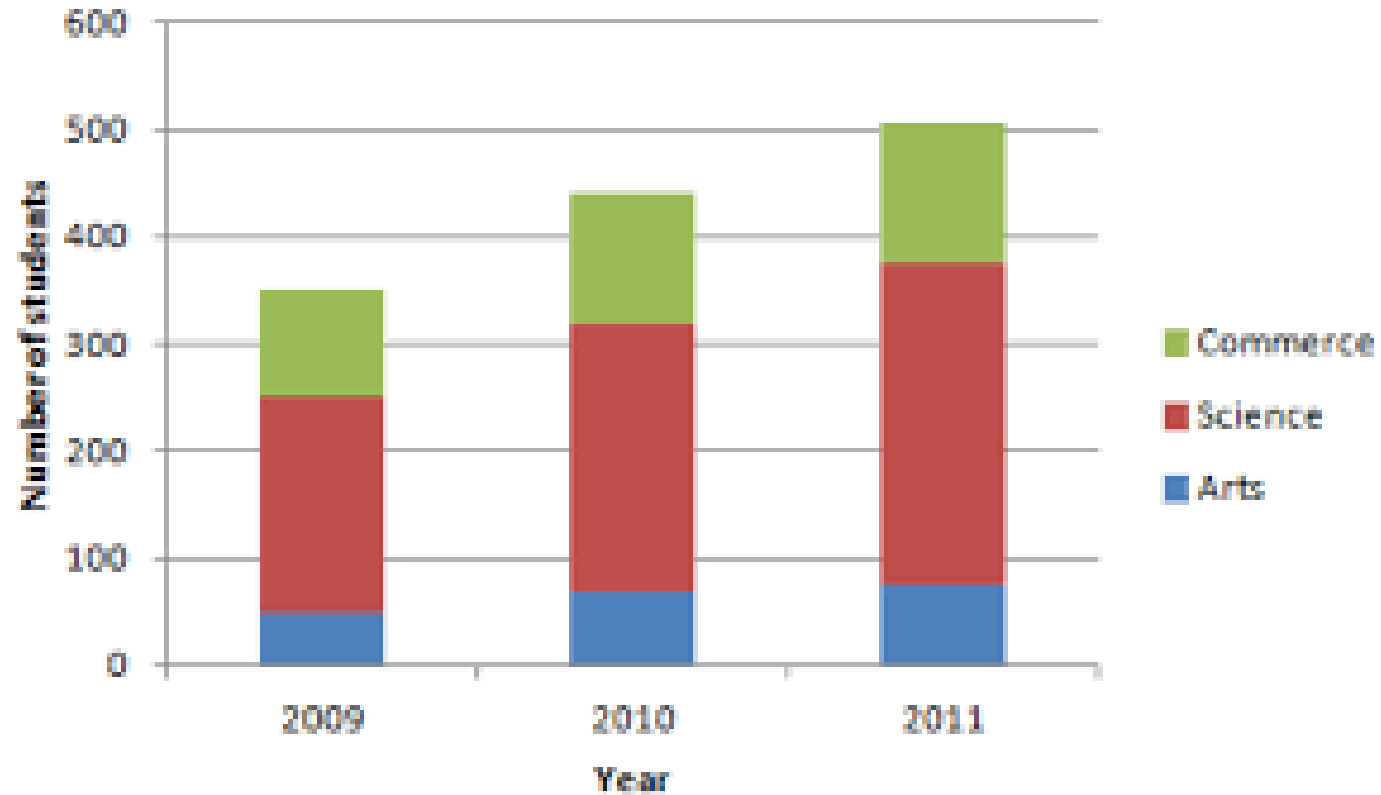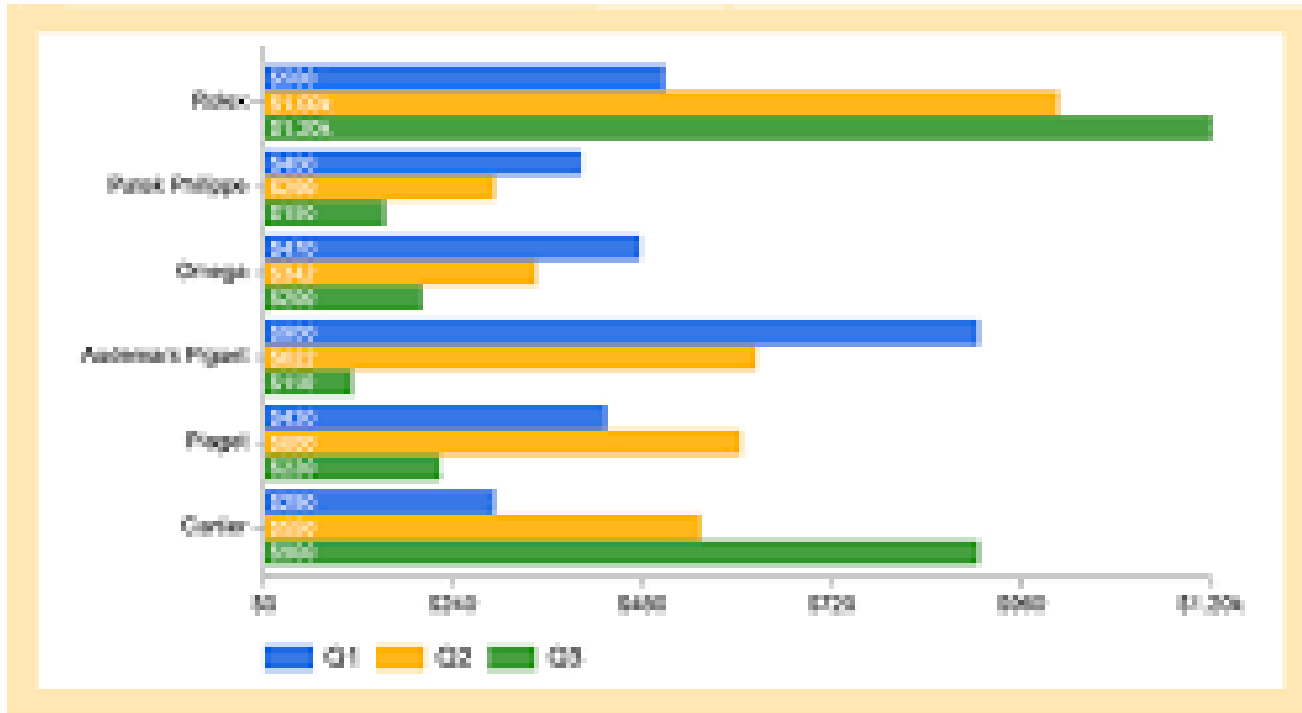
- The bar may be either horizontal or vertical
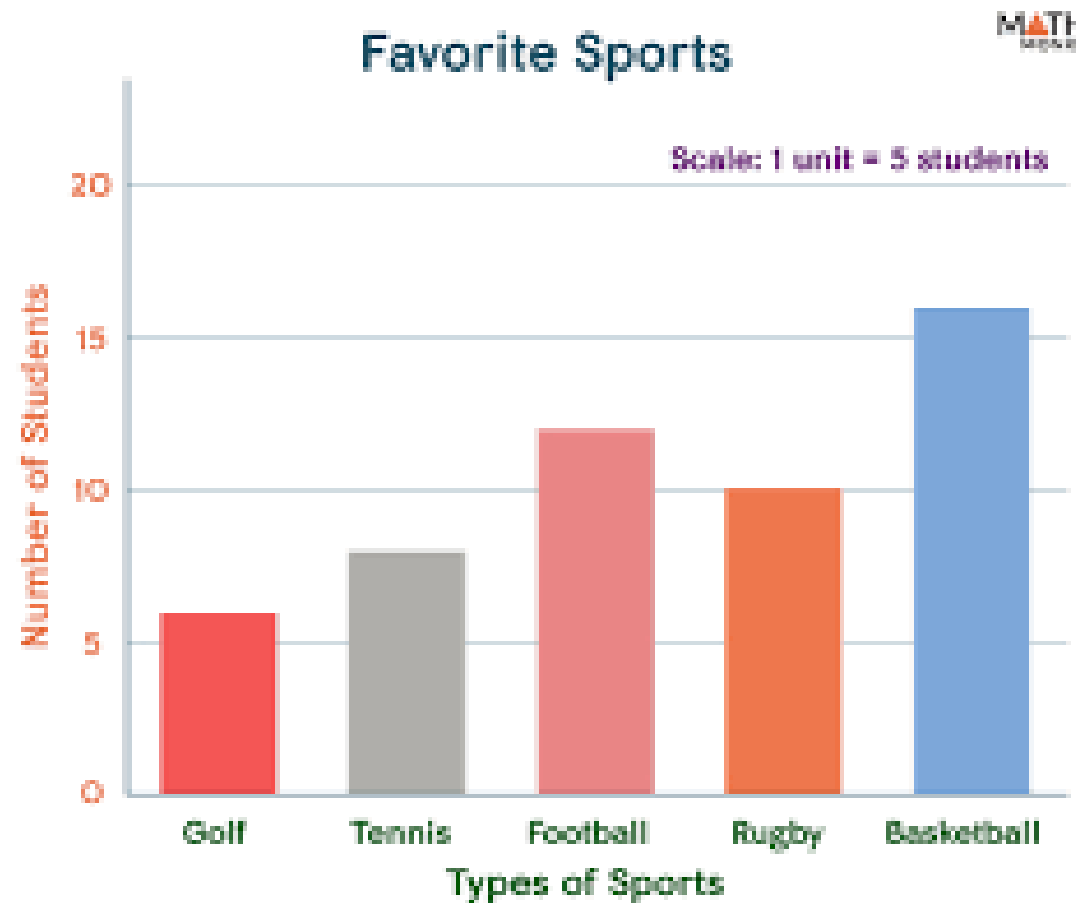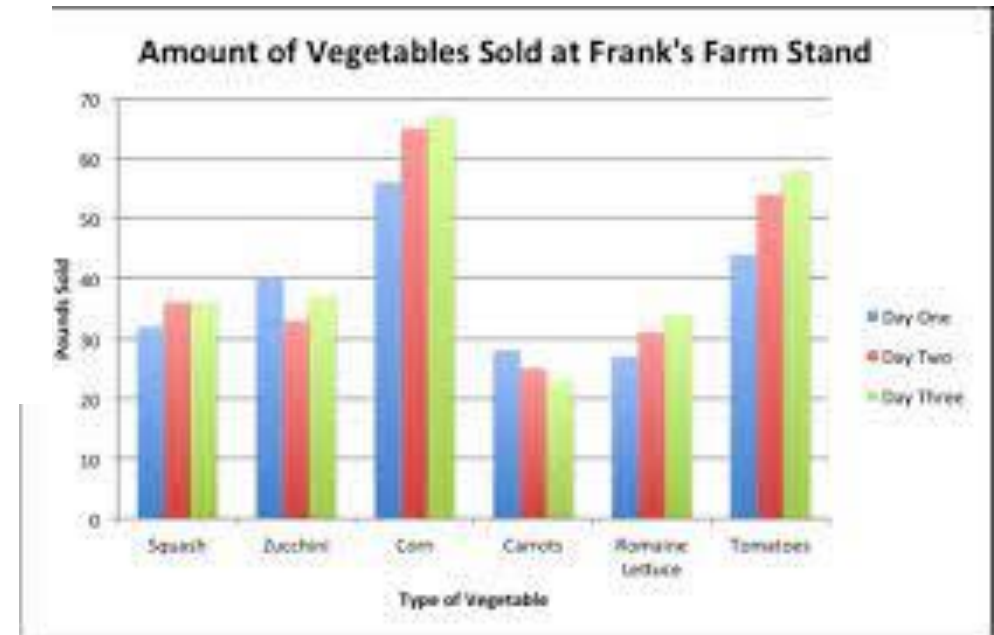
Nicest Fruit

Simple Bar diagram

Subdivided Bar diagram

Multiple Bar Diagram

How to Make a Multiple Bar Graph in Excel? Easy Steps

Deviation Bar Diagram