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MLIS Semester II
(Paper – 1)
Research Methods and Statistical Techniques
Topic – Data Representation
e-content

# DATA REPRESENTATION

Once data collection is completed, our efforts should be geared towards bringing these raw data into a presentable form of a table or a chart. The objective of classification of data is to make the data simple, concise, meaningful and helpful in further analysis.

There are three methods of presenting data :-

- Textual Presentation
- Tabular Presentation
- Graphical Presentation

# Tabular Presentation

Tabulation of data pertaining to different types of variables and later on we will move on to graphical presentation. The first step in the analysis and interpretation of data is its classification and tabulation. The process of arranging data into groups according to their common characteristics is known as its classification. On the other hand tabulation implies a systematic presentation of data in rows and columns according to some salient features or characteristics.

# Cumulative Frequency (monthly expenditure in Rupees)

| Class Interval | Frequency | Cumulative Frequency |
|---|---|---|
| Less than 200 | 21 | 21 |
| Less than 300 | 32 | 53 |
| Less than 400 | 49 | 102 |
| Less than 500 | 33 | 135 |
| Less than 600 | 23 | 158 |
| Less than 700 | 12 | 170 |
| Less than 800 | 5 | 175 |

# Graphical Presentation

- Line Graph
- Histogram
- Frequency Polygon
- Frequency Curve
- Bar Diagrams
- Pie Chart

# Line Graph

Line graph is appropriate when we need to present the movement or variation in a variable. It is quite simple to draw and indicates the increase or decrease in a variable over time or across observations. Line graphs can be used for discrete data. Recall that in the case of continuous data we assumed that the average value of each class is its mid-point. Thus we can plot the frequencies for each class against its mid-point and join these points to obtain a line graph.

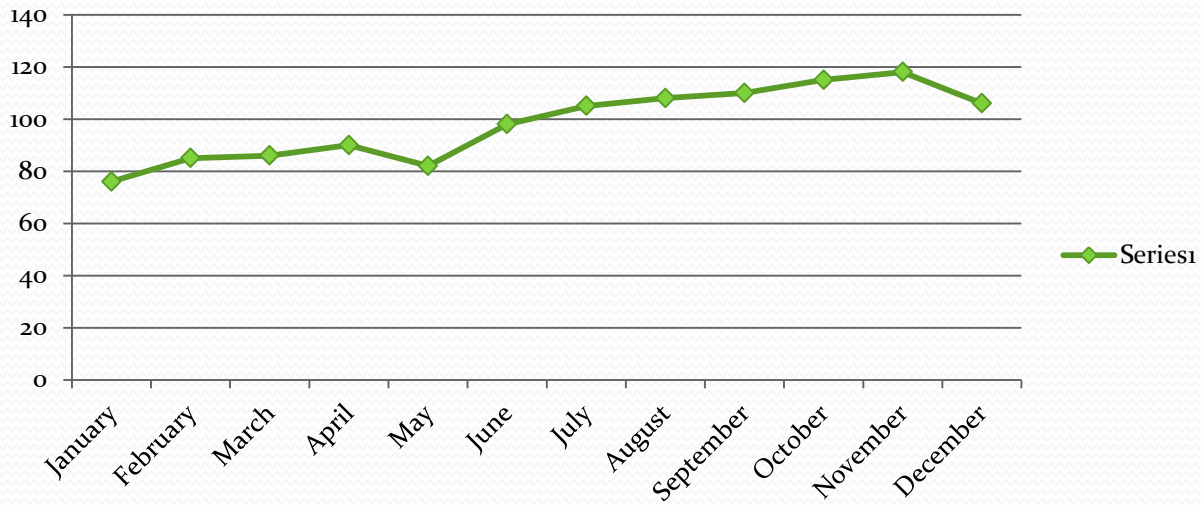
Example - number of books issued in a library (month- wise for the year 2019)

Number of Books Issued in a Library

| Months | No. of Visitors | Months | No. of Visitors |
|---|---|---|---|
| January | 76 | July | 105 |
| February | 85 | August | 108 |
| March | 86 | September | 110 |
| April | 90 | October | 115 |
| May | 82 | November | 118 |
| June | 98 | December | 106 |

Example - number of books issued in a library (month-wise for the year 2019)

Number of Books Issued in a Library



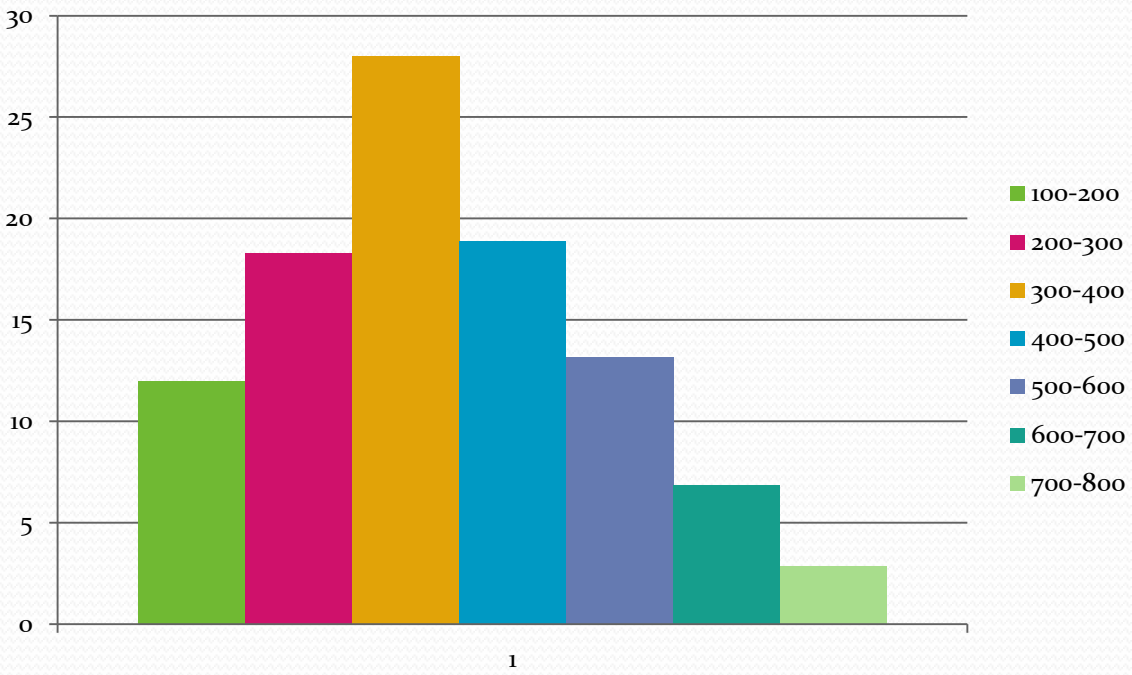
# Histogram

Histogram is a rectangular diagram where the area of each rectangle is proportional to the frequency of the respective class. Remember that histogram is appropriate for continuous data arranged into class intervals. It is not used for discrete data.

The steps followed are:

- On a graph paper we mark class intervals such as 100-200, 200-300, etc. on the horizontal axis.
- Similarly we mark frequencies on the vertical axis.
- We draw rectangles .
- When class intervals are equal the height of rectangles are equal to the frequency of classes.
- When class intervals are not equal the frequencies are adjusted so that area of rectangle is proportional to class frequency. For example, if the interval of one class is double that of other classes, then we need to divide the frequency of the former by two.

| Monthly expenditure on purchase of books (in Rupees) | | |
|---|---|---|
| Class Interval | Frequency | Relative Frequency |
| 100-200 | 21 | 12.00 |
| 200-300 | 32 | 18.29 |
| 300-400 | 49 | 28.00 |
| 400-500 | 33 | 18.86 |
| 500-600 | 23 | 13.14 |
| 600-700 | 12 | 6.86 |
| 700-800 | 5 | 2.86 |


30
25
20
15
10
5
0
1
100-200
200-300
300-400
400-500
500-600
600-700
700-800

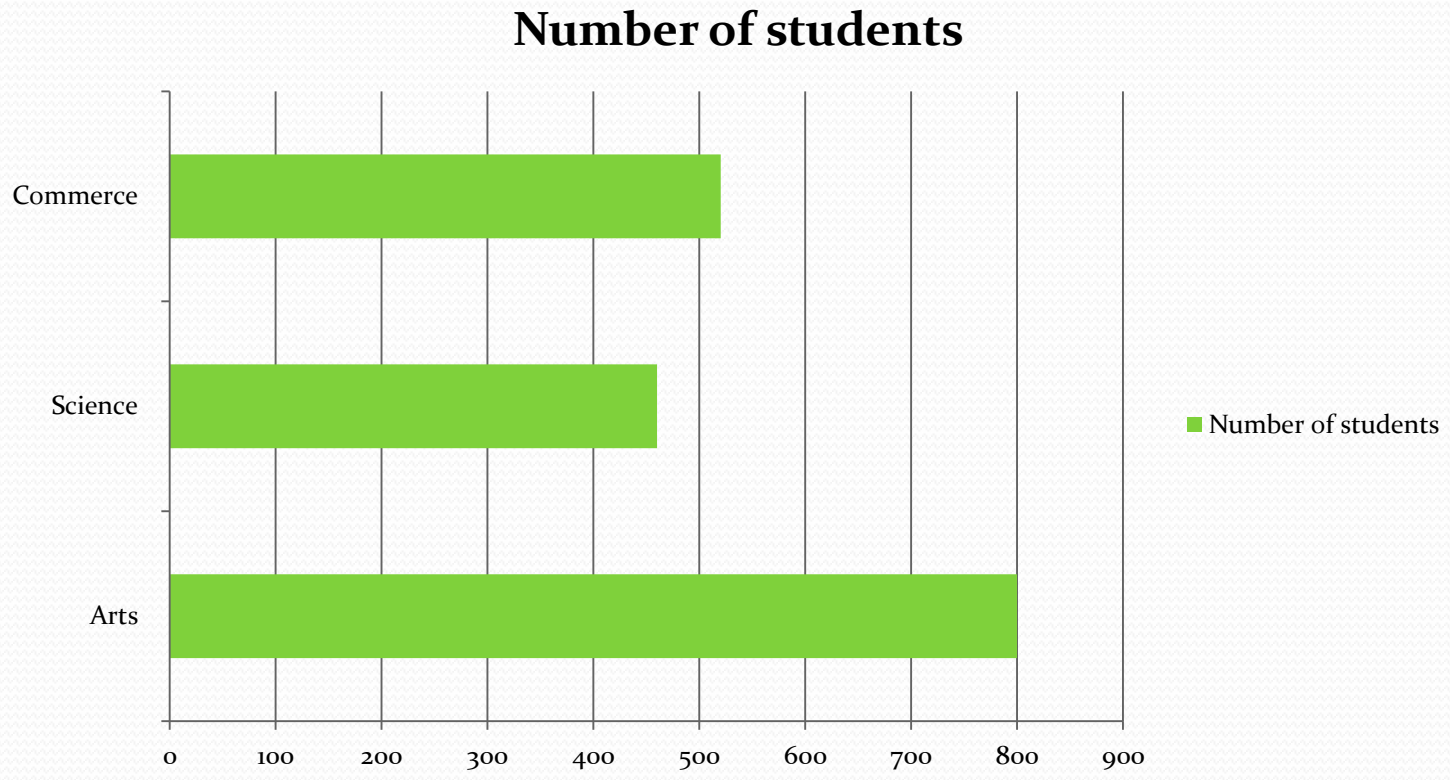
# Bar Diagrams

A bar is defined as a thick line, often made thicker to attract the attention of a reader. The height of the bar highlights the value of the variable. Remember that width of the bars does not mean anything. Moreover, bars are separated from each other with equal gaps. Thus it is different from histogram, which is more appropriate for quantitative data and area of the bars is important. Finally, in histogram the bars are always vertically placed whereas in bar diagram they can be placed both vertically as well as horizontally.

# Simple Bars

Number of students in a college

| Stream | Number of students |
|---|---|
| Arts | 800 |
| Science | 460 |
| Commerce | 520 |

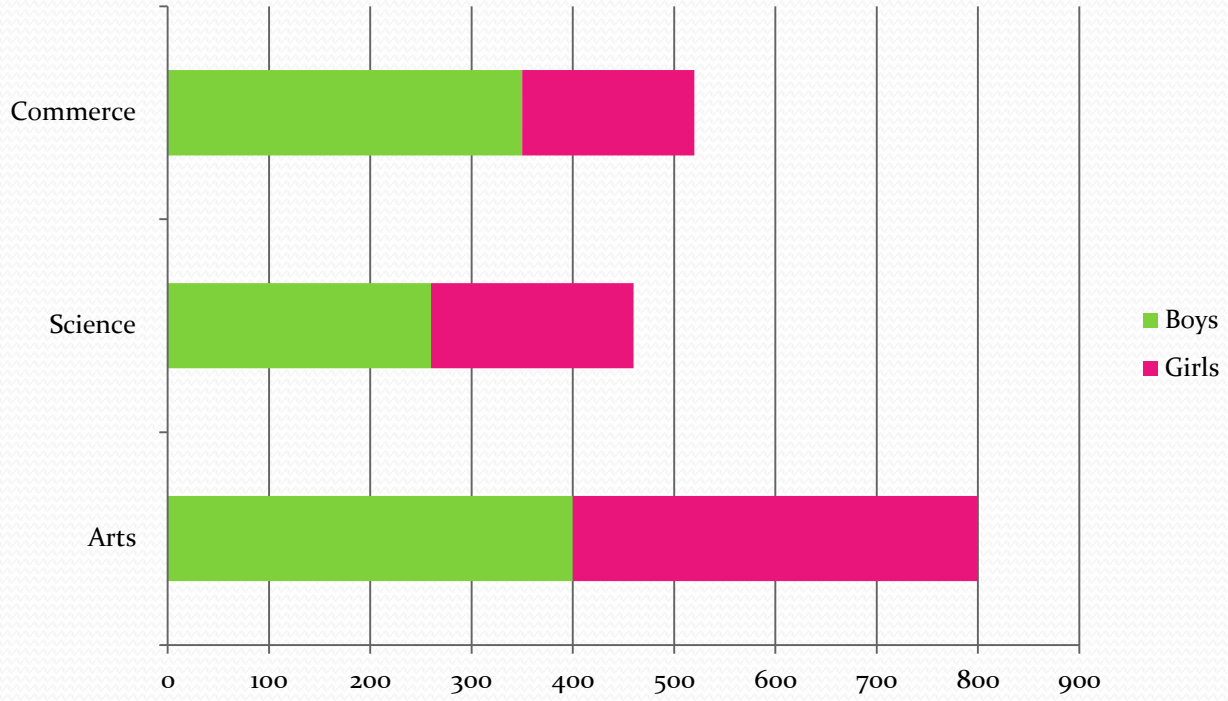

Number of students
Commerce
Science
Arts
0
100
200
300
400
500
600
700
800
900
Number of students

# Component Bar Diagrams

Number of students in a college

| Stream | Boys | Girls |
|---|---|---|
| Arts | 400 | 400 |
| Science | 260 | 200 |
| Commerce | 350 | 170 |

# Number of students in a college

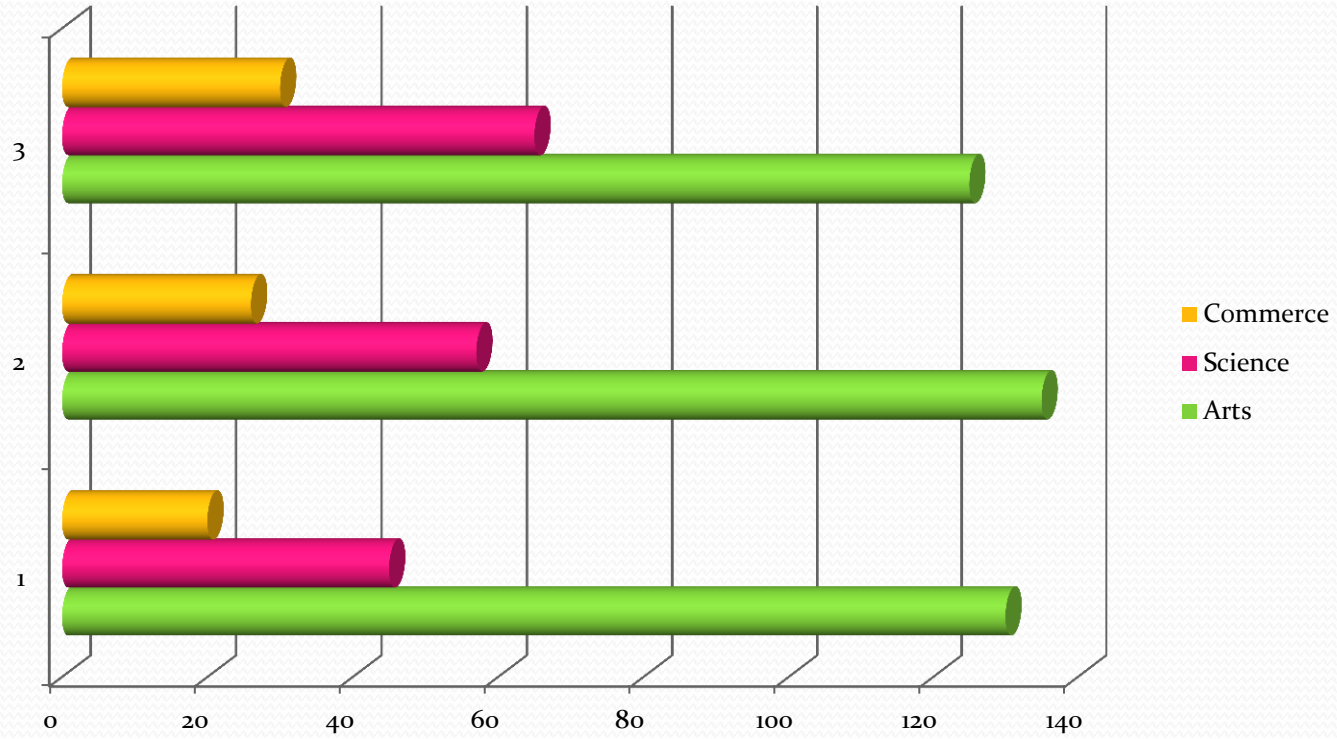


# Multiple Bar Diagrams

Number of Girls Student during past three years

| Stream | 2017 | 2018 | 2019 |
|---|---|---|---|
| Arts | 130 | 135 | 125 |
| Science | 45 | 57 | 65 |
| Commerce | 20 | 26 | 30 |

# Number of Girls Student during past three years



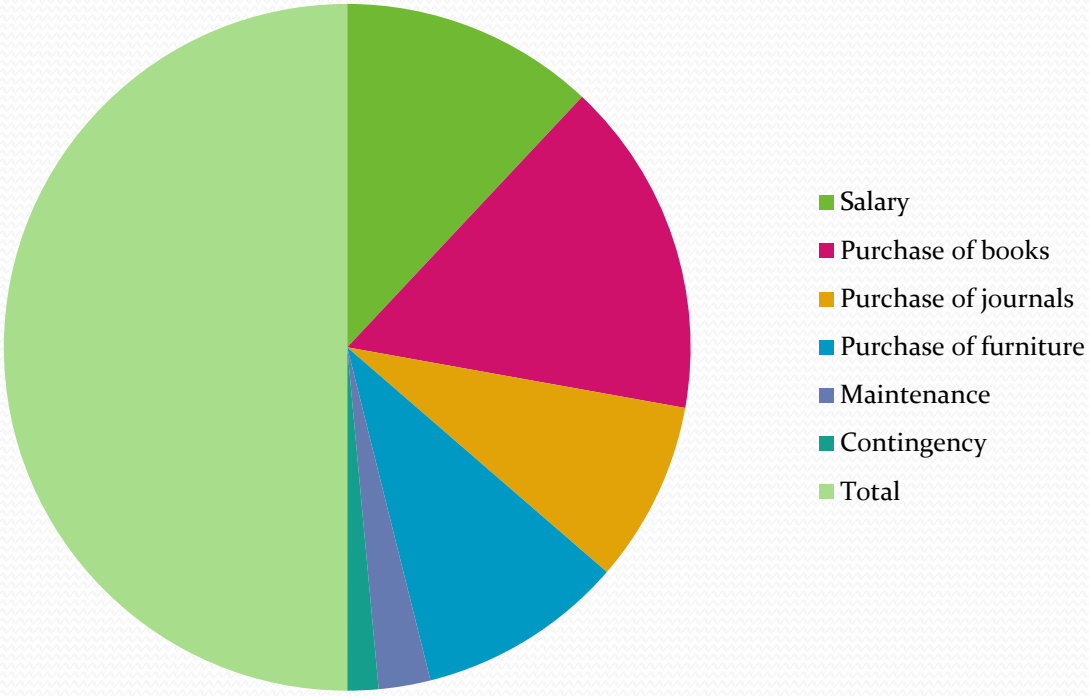
# Pie Chart

Pie chart is widely used to show share of different components in a variable. For example, expenditure of a library on different heads can be shown in the form a pie chart. Suppose for the financial year 2017-18 you have budget data of a library a circle has $360^0$. This area is divided into different components according respective share.

Heads of Expenditure in a Library (in Rs. Thousand)

| Heads of Expenditure | Budget | Ratio of the component | Degrees |
|---|---|---|---|
| Salary | 246 | 0.24 | $86.3^0$ |
| Purchase of books | 325 | 0.32 | $114.0^0$ |
| Purchase of journals | 175 | 0.17 | $61.4^0$ |
| Purchase of furniture | 200 | 0.19 | $70.2^0$ |
| Maintenance | 50 | 0.05 | $17.5^0$ |
| Contingency | 30 | 0.03 | $10.5^0$ |
| Total | 1026 | 1.00 | $360^0$ |

# Budget


Salary
Purchase of books
Purchase of journals
Purchase of furniture
Maintenance
Contingency
Total

# Thank You