INTRODUCTION

Statistics is the subject of collecting, organizing, and understanding information (data) to make useful and clear conclusions.
Data can be sorted into two main types:

Primary Data: Information collected directly for a specific purpose, usually by the person who needs it.

Secondary Data: Information that is taken from an existing source where it was already recorded or stored.

After we collect data, how we present it is very important. A clear presentation helps everyone see and understand the results easily. In this section, we will learn ways to present data using tables and graphs, with examples to guide us.

What is Meant by Presentation of Data?

Once data has been collected, it must be presented clearly so that its main features can be seen and understood quickly.
To do this, we use a presentation method that is meaningful, organized, and easy to read.

In statistics, data is usually presented in one of three ways:

Textual Method – using words and sentences.

Tabular Method – using tables and rows/columns.

Graphical Method – using charts and graphs.

Presentation of Data Examples

Now, let us discuss how to present the data in a meaningful way with the help of examples.

Example 1:
Consider the marks given below, which are obtained by 10 students in Mathematics:

36, 55, 73, 95, 42, 60, 78, 25, 62, 75.Find the range for the given data.

Solution:
Given Data: 36, 55, 73, 95, 42, 60, 78, 25, 62, 75.

The data given is called the raw data.

First, arrange the data in the ascending order: 25, 36, 42, 55, 60, 62, 73, 75, 78, 95.

Therefore, the lowest mark is 25 and the highest mark is 95.

We know that the range of the data is the difference between the highest and the lowest value in the dataset.

Therefore, Range = 95-25 = 70.

Note: Presentation of data in ascending or descending order can be time-consuming if we have a larger number of observations in an experiment.

Now, let us discuss how to present the data if we have a comparatively more number of observations in an experiment.

Example 2:

Consider the marks obtained by 30 students in Mathematics subject (out of 100 marks)

10, 20, 36, 92, 95, 40, 50, 56, 60, 70, 92, 88, 80, 70, 72, 70, 36, 40, 36, 40, 92, 40, 50, 50, 56, 60, 70, 60, 60, 88.

Solution:

In this example, the number of observations is larger compared to example 1. So, the presentation of data in ascending or descending order is a bit time-consuming. Hence, we can go for the method called ungrouped frequency distribution table or simply frequency distribution table. In this method, we can arrange the data in tabular form in terms of frequency.

For example, 3 students scored 50 marks. Hence, the frequency of 50 marks is 3. Now, let us construct the frequency distribution table for the given data.

70	4
72	1
80	1
88	2
92	3
95	1
Total	30

The following example shows the presentation of data for the larger number of observations in an experiment.

Example 3:

Consider the marks obtained by 100 students in a Mathematics subject (out of 100 marks)

95, 67, 28, 32, 65, 65, 69, 33, 98, 96,76, 42, 32, 38, 42, 40, 40, 69, 95, 92, 75, 83, 76, 83, 85, 62, 37, 65, 63, 42, 89, 65, 73, 81, 49, 52, 64, 76, 83, 92, 93, 68, 52, 79, 81, 83, 59, 82, 75, 82, 86, 90, 44, 62, 31, 36, 38, 42, 39, 83, 87, 56, 58, 23, 35, 76, 83, 85, 30, 68, 69, 83, 86, 43, 45, 39, 83, 75, 66, 83, 92, 75, 89, 66, 91, 27, 88, 89, 93, 42, 53, 69, 90, 55, 66, 49, 52, 83, 34, 36.

Solution:

Now, we have 100 observations to present the data. In this case, we have more data when compared to example 1 and example 2. So, these data can be arranged in the tabular form called the grouped frequency table. Hence, we group the given data like 20-29, 30-39, 40-49, ….,90-99 (As our data is from 23 to 98). The grouping of data is called the “class interval” or “classes”, and the size of the class is called “class-size” or “class-width”.

In this case, the class size is 10. In each class, we have a lower-class limit and an upper-class limit. For example, if the class interval is 30-39, the lower-class limit is 30, and the upper-class limit is 39. Therefore, the least number in the class interval is called the lower-class limit and the greatest limit in the class interval is called upper-class limit.

Hence, the presentation of data in the grouped frequency table is given in the next slide:

Class Interval (Marks)	Frequency (Number of students)
20 – 29	3
30 – 39	14
40 – 49	12
50 – 59	8
60 – 69	18
70 – 79	10
80 – 89	23
90 – 99	12
Total	100

Hence, the presentation of data in this form simplifies the data and it helps to enable the observer to understand the main feature of data at a glance.

Practice Problems:

1.The heights of 50 students (in cms) are given below. Present the data using the grouped frequency table by taking the class intervals as 160 -164, 165 -169, and so on. Data: 161, 150, 154, 165, 168, 161, 154, 162, 150, 151, 162, 164, 171, 165, 158, 154, 156, 172, 160, 170, 153, 159, 161, 170, 162, 165, 166, 168, 165, 164, 154, 152, 153, 156, 158, 162, 160, 161, 173, 166, 161, 159, 162, 167, 168, 159, 158, 153, 154, 159.

Solution:

Choose class intervals covering whole range

Smallest height = 150 cm

Largest height = 173 cm

If we follow 160–164, 165–169, we need classes for 150–154, 155–159 first.

Let's set intervals of width 5:

150–154, 155–159, 160–164, 165–169, 170–174.

Sort data and assign to intervals

Sorted heights (for easier counting):

150, 150, 151, 152, 153, 153, 153, 154, 154, 154, 154, 154,
156, 156, 158, 158, 158, 159, 159, 159, 159,
160, 160, 161, 161, 161, 161, 161, 162, 162, 162, 162, 162, 164, 164,
165, 165, 165, 165, 166, 166, 167, 168, 168, 168,
170, 170, 171, 172, 173

Tally and frequency

150 – 154: 150, 150, 151, 152, 153, 153, 153, 154, 154, 154, 154, 154 → 12

155 – 159: 156, 156, 158, 158, 158, 159, 159, 159, 159 → 9

160 – 164: 160, 160, 161, 161, 161, 161, 161, 162, 162, 162, 162, 162, 164, 164 → 14

165 – 169: 165, 165, 165, 165, 166, 166, 167, 168, 168, 168 → 10

170 – 174: 170, 170, 171, 172, 173 → 5

Total: 12 + 9 + 14 + 10 + 5 = 50

The presentation of data in the grouped frequency table is given in the next slide:

Height (cm)	Frequency
150 – 154	12
155 – 159	9
160 – 164	14
165 – 169	10
170 – 174	5
Total	50

Practice Problems:

2.Three coins are tossed simultaneously and each time the number of heads occurring is noted and it is given below. Present the data using the frequency distribution table. Data: 0, 1, 2, 2, 1, 2, 3, 1, 3, 0, 1, 3, 1, 1, 2, 2, 0, 1, 2, 1, 3, 0, 0, 1, 1, 2, 3, 2, 2, 0.

Solution:

List the data

0, 1, 2, 2, 1, 2, 3, 1, 3, 0,
1, 3, 1, 1, 2, 2, 0, 1, 2, 1,
3, 0, 0, 1, 1, 2, 3, 2, 2, 0

Count frequency for each number of heads

Number of heads = 0
Occurrences: 0, 0, 0, 0, 0, 0 → 6 times

Number of heads = 1
Occurrences: 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1 → 12 times

Number of heads = 2
Positions 2, 2, 2, 2, 2, 2, 2, 2, 2 → 9 twos.

Number of heads = 3
Positions 3, 3, 3, 3, 3 → 5 threes.

Verify total

0's: 6

1's: 10

2's: 9

3's: 5

Sum = 6 + 10 + 9 + 5 = 30

The presentation of data in the grouped frequency table is given in the next slide:

Number of Heads	Frequency
0	6
1	10
2	9
3	5
Total	30

What is Tabular Presentation of Data?

It is a table that helps to represent even a large amount of data in an engaging, easy to read, and coordinated manner. The data is arranged in rows and columns. This is one of the most popularly used forms of presentation of data as data tables are simple to prepare and read.

The most significant benefit of tabulation is that it coordinates data for additional statistical treatment and decision making. The analysis used in tabulation is of four types. They are:

1.Qualitative
2.Quantitative
3.Temporal
4.Spatial

1. Qualitative classification: When the classification is done according to traits such as physical status, nationality, social status, etc., it is known as qualitative classification.

2. Quantitative classification: In this, the data is classified on the basis of features that are quantitative in nature. In other words, these features can be estimated quantitatively.

3. Temporal classification: In this classification, time becomes the categorising variable and data are classified according to time. Time, maybe in years, months, weeks, days, hours, etc.,

4. Spatial classification: When the categorisation is done on the basis of location, it is known as spatial classification. The place may be a country, state, district, block, village/town, etc.

Basics of Tabular Presentation

Concept of Tabulation

- Tabulation, i.e., tabular presentation of data is a method of presentation of data.
- It is a systematic and logical arrangement of data in the form of rows and columns with respect to the characteristics of data.
- It is an orderly arrangement which is compact and self-explanatory.
- Its objective is to: Present the data in a simple form, economies (save) space, facilitate comparison, facilitate statistical analysis, reduce the chances of errors.

An Illustration of a Blank Table to Present

Faculty/Stream wise Distribution of Students of Senior Secondary Classes in an Institution

Table no.(2017/1)

Faculty-wise distribution of students

(Head note)

Faculty	XI	XII	Total
Science **Commerce** **Arts**			
Total			

- **Source**
- **Footnote**

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Faculty/Stream wise Distribution of Students of Senior Secondary Classes in an Institution

Table no.(2017/1)

Faculty-wise distribution of students

(Head note)

Faculty	XI	XII	Total
Science	2	3	5
Commerce	3	2	5
Arts	10	4	14
Total	15	9	24

- **Source**
- **Footnote**

Table Number: .....
Title: .....
(Head Note, if any)

Stub (Row Heading)	Caption (Column Heading)				Total (Rows)
	Sub-head		Sub-head		
	Column-head	Column-head	Column-head	Column-head	
Stub Entries (Row Entries)		Body			
Total Columns					

Source Note:
Footnote:

Objectives Of Tabulation

Following are the objectives of tabulation:

To simplify the complex data
To bring out essential features of the data
To facilitate comparison
To facilitate statistical analysis
Saving of space

What are the Three Limitations of a Table?
Following are the major limitations of a table:

(1) Lacks description

The table represents only figures and not attributes.
It ignores the qualitative aspects of the facts.
(2) Incapable of presenting individual items

It does not present individual items.
It presents aggregate data.
(3) Needs special knowledge

The understanding of the table requires special knowledge.
It cannot be easily used by a layman.

The Main Parts of a Table:

Following are the main parts of a table:

(1) **Table number**

●Table number is the very first item mentioned on the top of each table for easy identification and further reference.

(2) **Title**

● Title of the table is the second item that is shown just above the table.

● It narrates the contents of the table, hence it has to be very clear, brief, and carefully worded.

(3) **Head note**

● It is the third item just above the table and shown after the title.

● It gives information about units of data like, 'amount in rupees or $', "quantity in tonnes', etc.

●It is generally given in brackets.

(4) **Captions or Column headings**

●At the top of each column in a table, a column designation/head is given to explain the figures of the column.

● This column heading is known as 'caption'.

(5) Stubs or Row headings

●The title of the horizontal rows is known as 'stubs'.

(6) Body of the table

● It contains the numeric information and reveals the whole story of investigated facts. Columns are read vertically from top to bottom and rows are read horizontally from left to right.

(7) Source note

● It is a brief statement or phrase indicating the source of data presented in the table.

(8) Footnote

● It explains the specific feature of the table which is not self-explanatory and has not been explained earlier. For example, points of exception if any.

END