

# Statistics

## Agenda:

What is Statistics?

Types of Statistics?

Type of Data in statistics?

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## What is Statistics?

- Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data.
- In other words, it is a mathematical discipline to collect, summarize data.

## Statistics Terminologies

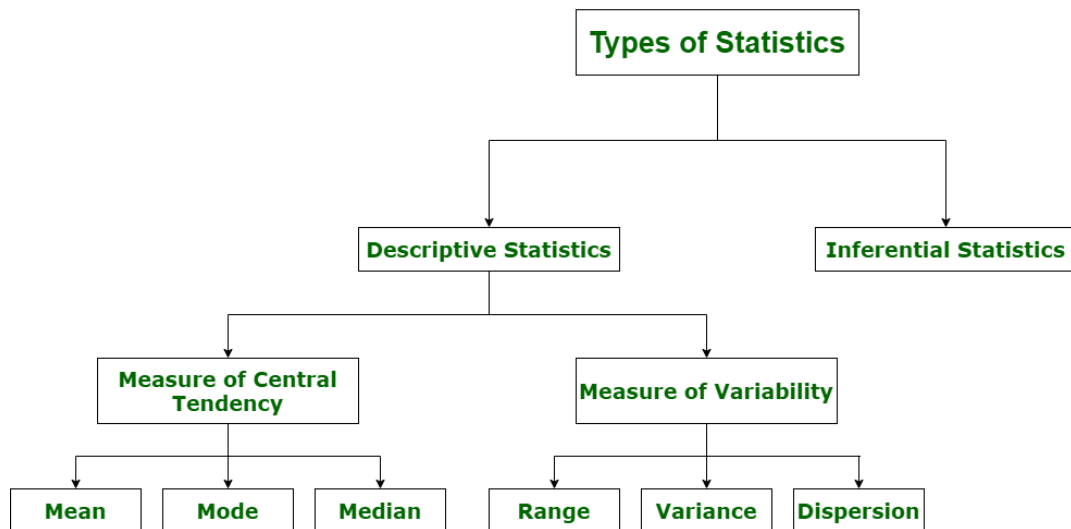
Some of the most common terms you might come across in statistics are:

- **Population:** It is a collection of a set of individual objects or events whose properties are to be analysed.
- **Sample:** It is the subset of a population.

## Types of Statistics

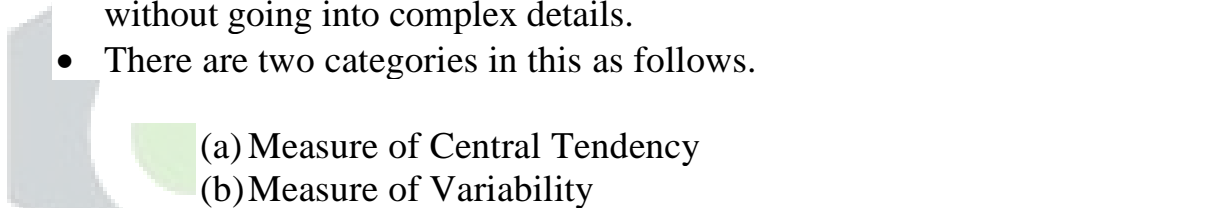
There are 2 types of statistics:

1. Descriptive Statistics
2. Inferential Statistics



## Descriptive Statistics

- Descriptive statistics are a way of summarizing and describing the main features of a dataset.
- They help us understand and communicate key characteristics of the data without going into complex details.
- There are two categories in this as follows.



## Measures of Central Tendency:

**Mean (Average):** The sum of all values divided by the number of values.

$$\text{Mean} = \sum x/n$$

**Median:** The middle value when the data is arranged in ascending order.

If n is Even

- Median =  $[(n/2)^{\text{th}} \text{ term} + (n/2 + 1)^{\text{th}} \text{ term}]/2$

If n is Odd

- Median =  $(n + 1)/2$

**Mode:** The value that appears most frequently.

**Measures of I** Mode = Term with Highest Frequency

**Range:** The difference between the maximum and minimum values.

$$\text{Range} = \text{Maximum value} - \text{Minimum value}$$

**Variance:** Variance measures how much each number in the dataset differs from the mean, squared.

$$S^2 = \sum_{i=1}^n [(x_i - \bar{x})^2 / n]$$

- $n$  represents total data points
- $\bar{x}$  represents the mean of data points
- $x_i$  represents individual data points

**Standard Deviation:** The square root of the variance.

$$\sigma = \sqrt{(1/n) \sum_{i=1}^n (x_i - \mu)^2}$$

## Inferential Statistics

Inferential statistics involves making predictions, inferences, or generalizations about a population based on a sample of data from that population.

Types of Inferential Statistics:

- Sampling
- Hypothesis Testing
- Confidence Intervals
- One Sample test
- T-test or Anova

**Type of Data in Statistics:**

**What is Data?**

Data is the collection of numbers, words or anything that can be arranged to form a meaningful information.

Types of Data?

- 1) Qualitative data
- 2) Quantitative data

### **Qualitative Data:**

Qualitative data is the descriptive data of any object.

Example: Kumar is a Tail boy.

### **Quantitative Data:**

Quantitative data is the numerical data of any object.

Example: This Class contain 8 members

### **Types of Quantitative Data**

We have two types of quantitative data that include,

1. **Discreate Data:** The data that have fixed value is called discreate data, discreate data can easily be counted.
2. **Continuous Data:** The data that has no fixed value and has a range of data is called continuous data. It can be measured.

### **Representation of Data:**

We can easily represent the data using various graphs, charts or tables. Various types of representing data set are,

- Bar Graph
- Pie Chart
- Line Graph
- Histogram
- Frequency Distribution

