INTRODUCTION TO DATA ANALYSIS

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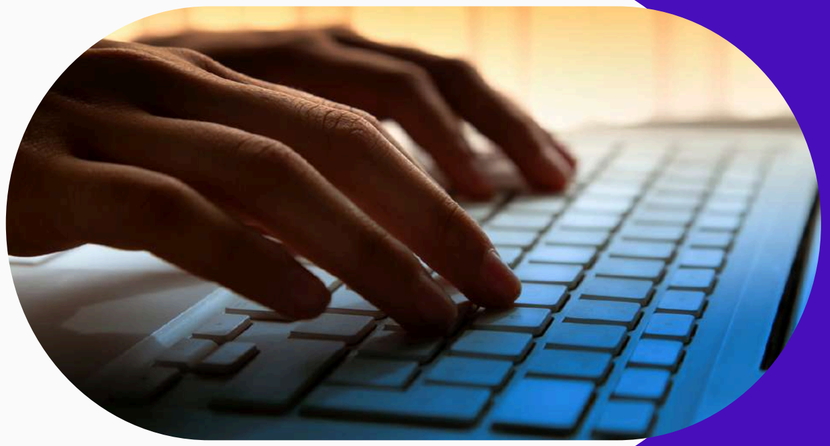
What is Data?

- Data refers to facts, figures, or information that can be in the form of text, numbers, images, or any other format, collected, analyzed, and processed to derive meaning or insights.
- It can be structured or unstructured and is used across various fields for decision-making and analysis.
- Examples includes: age of individuals, customer reviews or comments, daily stock prices of companies, images, videos, audio files etc.



Types of Data (Sources)

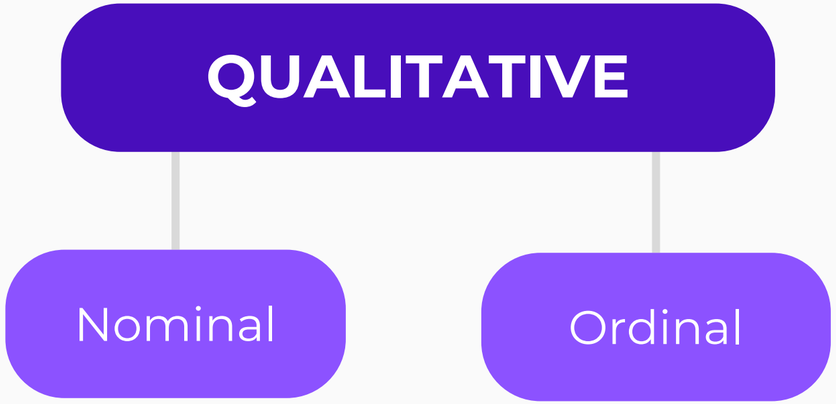
01 **Primary Data:** Information collected directly from original sources. This data is first-hand and has not been previously gathered, processed, or interpreted by others. Examples of primary data include surveys, interviews, observations, and experiments.

02 **Secondary Data:** Information that has already been collected, processed, and published by someone else. it is derived from the analysis of data that initially collected for a different purpose. Examples include data from government reports, academic studies, or industry publications.

Types of Data (Forms)

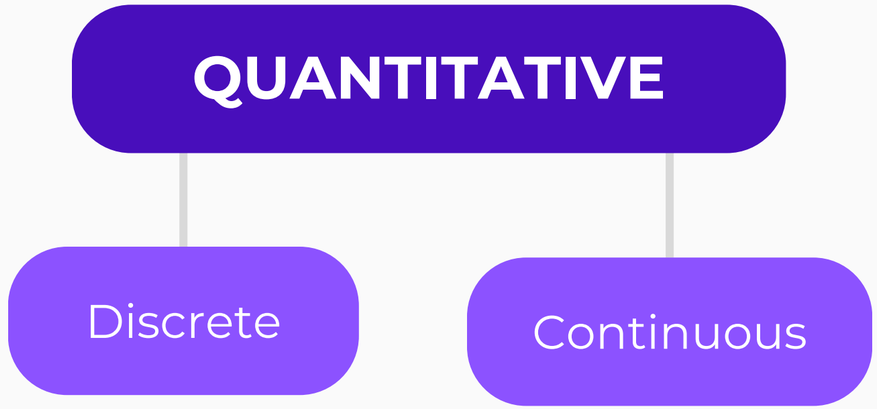
- Categories of data that dictate how data can be stored, processed, and interpreted. This is important in data analysis and statistical modeling

Categorical



- Qualitative or Categorical Data is a type of data that can’t be measured or counted in the form of numbers.
- It tells about the perception of people

Numerical



- Quantitative data is a type of data that can be expressed in numerical values, making it countable and including statistical data analysis.

Types of Data (Contd.)

Qualitative Data

Nominal Data

- Nominal Data is used to label categorical variables without any order or quantitative value.
- Examples Gender, Marital status, Nationality, Colour of hair etc.

Ordinal Data

- Ordinal data have natural ordering where a number is present in some kind of order by their position on the scale.
- These data are used for observation like customer satisfaction, happiness, Educational Level etc.

Quantitative Data

Discrete Data

- The discrete data are countable and have finite values; their subdivision is not possible.
- Examples no of employees in a company, No. of students present in a class, days of the week etc.

Continous Data

- Continuous data represents information that can be divided into smaller levels especially in the form of fractional numbers.
- Examples: The height of a person, length of an object, market share price.

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What is Data Analysis?

- Data analysis is the process of looking at and summarizing Data with the intent to extract useful information and develop conclusions.
- Data analysis can either be Qualitative or Quantitative.
- But we are more interested in Quantitative
- Helps quantify the variation in a phenomenon, situation, problem or issue.
- The information is gathered using predominantly quantitative variables, and the analysis is geared to ascertain the magnitude of the variation.

Types of Quantitative Analysis?

Descriptive or summary statistics

- These are used to describe or summarise data so that reader can construct a mental picture of the data and the people, events or objects of interest. Include:
  - measures of central tendency: mean, median and mode,
  - measures of variability range and standard deviation
  - Frequency, percentages and various charts

Inferential statistics

- This is a branch of statistics that allows researchers to make conclusions or inferences about a population based on a sample of data drawn from that population. It involves using data analysis to estimate population parameters, test hypotheses, and predict future outcomes.

Types of Data Arrangement?

There are three (3) major types:

- **Cross-Sectional:** Data collected on different entities at a given point in time, for example the salary of 10 employees of a company in 2024.
- **Time Series:** Data collected on a single entity over many periods. The period is usually of fixed interval like daily, weekly monthly, quarterly or yearly. For example, salary of a single employee company for 5 years (2020 – 2024)
- **Pooled/Panel:** This is a combination of Cross-sectional and Time Series. It is data collected across many entities over many periods. Example, salary of 10 employees in a company for 5 years (2020 – 2024)

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