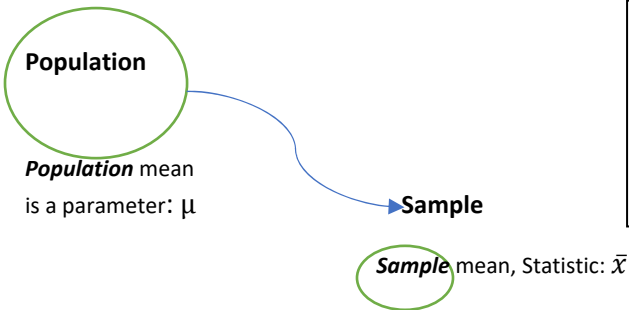


Statistics → Data

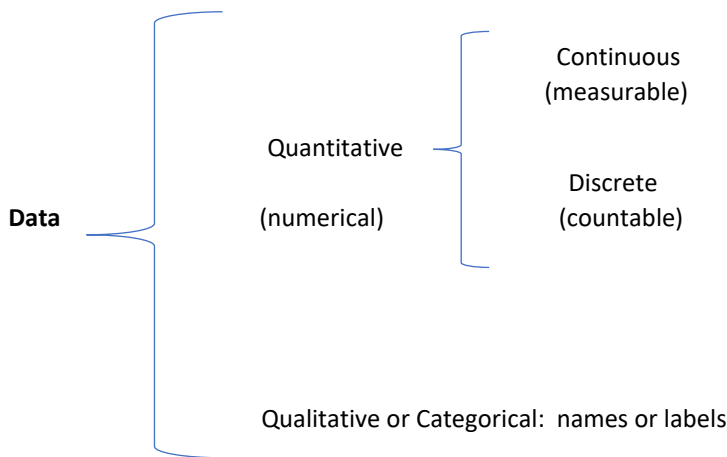
Statistics is the science of conducting studies to collect, organize, summarize, analyze, and draw conclusions from data.



Descriptive statistics consists of the collection, organization, summarization, and presentation of data.
Inferential statistics consists of generalizing from samples to populations, performing estimations and hypothesis tests, determining relationships among variables, and making predictions.

In statistics, **population** is the entire set of items from which you draw data for a statistical study.
 A **sample** is a subset of a larger population that contains characteristics of that population. A sample is used in statistical testing when the population size is too large for all members or observations to be included in the test.

Classification of Data



A simple random sample is a subset of a statistical population in which each member of the subset has an equal probability of being chosen.

Collecting data:

Simple random sample:

...every possible sample of size n, has the same chance of being chosen....

Examples of populations & samples:

<https://online.stat.psu.edu/stat200/lesson/1/1.2>

Examples of quantitative data & qualitative data:

Quantitative Data:

Number of students in a class: 25
Average score on a test: 75%
Number of hours spent studying per week: 10
Age of a person: 30
Number of books sold: 500
Average temperature in a city: 22°C
Number of miles driven in a car: 100
Number of employees in a company: 50
Number of customers who responded to a survey: 100

Quantitative data is typically measured and recorded using numbers, and can be analyzed using statistical methods to identify patterns and trends.

Qualitative Data:

Descriptions: Hair color (e.g., brown, blonde), eye color (e.g., blue, green).

Categories: Types of fruits (e.g., apple, banana, orange).

Opinions: Responses to open-ended questions (e.g., "What do you like about this product?").

Labels: Blood types (e.g., A, B, AB, O).

Qualitative data is typically non-numerical and is often collected through methods such as surveys, interviews, or focus groups. It is often analyzed using techniques such as content analysis or thematic analysis to identify patterns and themes.

Examples of continuous data & discrete data:

Continuous Data: continuous data can take any numeric value within a given range and can be meaningfully split into smaller parts.

Weight: The weight of an object (e.g., 65.5 kg).
Height: The height of a person (e.g., 175 cm).
Time: Duration (e.g., 3.5 hours).
Temperature: Measured in degrees (e.g., 30.2°C).
Length: Distance (e.g., 2.5 meters).

Discrete Data: discrete data consists of distinct, separate values that cannot be further subdivided.

Shoe Size: Shoe sizes (e.g., 8, 9, 10).
Number of Siblings: Count of siblings (e.g., 2, 3, 4).
Cars in a Parking Lot: Whole numbers (e.g., 20 cars).
Days in the Month with Temperature Above 30 Degrees: Count of specific days (e.g., 5 days).
Number of Students in a Class: Whole numbers (e.g., 30 students).

Remember that continuous data can have decimal places, while discrete data consists of whole numbers.