

The  of a study is the group the collected data is intended to describe.

Sometimes the intended population is called the target population, since in badly designed studies, the collected data may not be

EXAMPLE

A university sends out a survey to all students in the cafeteria asking about their satisfaction with campus facilities.

What is the population?

EXAMPLE

A local fitness center posts a survey on their website asking visitors how often they exercise each week.

What is the population?

A  is a value (average, percentage, etc.) calculated using all the data from a population.

## EXAMPLES

If you calculate the average income of every person in a city, that average is a

If you determine the

that percentage is a parameter.

is called a census.

## EXAMPLE

Every ten years, the United States conducts a national census, where the government attempts to count every person living in the country. The data collected includes information such as age, gender, race, household size, and housing conditions. This information is used for things like determining the number of seats each state has in the U.S. House of Representatives.

## EXAMPLE

### School Enrollment Census

A school district may conduct a census at the beginning of each academic year to account for every student enrolled in its schools. The census gathers data on student demographics, such as grade level, age, and special education needs, to help allocate resources and plan educational programs.

Since surveying an entire population is often impractical, we usually select a sample to study.

## SAMPLE

A sample is a



## EXAMPLE

If you're interested in the average height of adults in a city, you might measure the height of 1,000 adults randomly selected from the city's population. This group of 1,000 people is your sample, and the average height calculated from this group is meant to represent the average height of all adults in the city.

## EXAMPLE

In a political poll, a sample of voters (say, 1,500 people) is surveyed to estimate how the entire population of voters will vote in an upcoming election.

# A statistic is

## EXAMPLE

If you conduct a survey with 500 people in a city and determine that 60% of them prefer a certain brand of coffee, that 60% is a .

## EXAMPLE

### Medical Study

Researchers conduct a study with a sample of 500 patients to determine the average reduction in blood pressure after taking a new medication. They find that the average reduction in blood pressure among the sample is 10 mmHg. This 10 mmHg is a statistic because

## EXAMPLE

### Public Health Survey

A health department surveys 800 residents to estimate the prevalence of smoking in a community. They find that 10% of the respondents smoke regularly. This 10% smoking rate is a  because it is based on the data from the sample of residents.

## QUESTION

A public health researcher wants to assess how residents of New Jersey feel about a new community initiative. To collect opinions, she goes to the New Jersey Farmers Market and randomly surveys 300 visitors. She finds that 70% of those surveyed support the initiative.

What is the sample and population?

Is the 70% value a parameter or a statistic?

## QUESTION

An economist wants to find out how employees in San Francisco feel about a proposed change in city minimum wage laws. She visits the San Francisco Ferry Building and randomly interviews 350 workers there. The results show that 55% of those interviewed support the wage increase.

What is the sample and population?

Is the 55% value a parameter or a statistic?

## QUESTION

To estimate the average weight of apples in an orchard, a researcher picks 50 apples from different trees throughout the orchard and weighs them.

What is the sample and population in this study?

## QUESTION

A hotel manager wants to estimate the average length of stay for guests at the hotel. She reviews the records of 500 randomly selected guests from the past month and calculates their average length of stay.

What is the sample and population in this study?

## QUESTION

A company announces that the average annual salary of all its employees is \$65,000.

Is this a statistic or a parameter?

## QUESTION

A survey conducted by a market research firm interviews 200 randomly selected employees from various companies in a city. The survey finds that the average commute time for these employees is 30 minutes.

Is this a statistic or a parameter?

**CENSUS**  
**Parameter**  
**SURVEY**  
**Statistic**

**Categorical (qualitative) data** are pieces of information that allow us to classify the objects under investigation into

# Quantitative data are

## EXAMPLE

A researcher is conducting a study on the favorite colors of people in a community. She collects responses from 100 people, and the colors reported are red, blue, green, and yellow.

The data is qualitative because

## EXAMPLE

An online bookstore tracks the number of books sold each month. In January, they sold 150 books, in February 200 books, and in March 175 books.

The data is  because it consists of numerical values representing the number of books sold.

## EXAMPLE

A company surveys its employees about their job satisfaction. The responses include categories such as "Very Satisfied," "Satisfied," "Neutral," "Dissatisfied," and "Very Dissatisfied."

The data is

## EXAMPLE

A hospital records the number of patients admitted each day. On Monday, there were 30 patients, on Tuesday, 45 patients, and on Wednesday, 40 patients.

The data is quantitative because

## QUESTION

A tourist attraction logs the different countries from which visitors come, such as France, Japan, Brazil, and Canada.

Is the data qualitative or quantitative?

## QUESTION

A company records the number of new hires each month. The counts for the past three months are 8, 12, and 10 new hires.

Is the data qualitative or quantitative?

## QUESTION

A research study measures the daily water intake of participants in liters. The recorded intakes are 1.5 liters, 2.0 liters, and 2.5 liters.

Is the data qualitative or quantitative?



QUESTION

A librarian categorizes books in the library by genre, such as fiction, non-fiction, mystery, and science fiction.

Is the data qualitative or quantitative?

QUESTION

A company assigns employee ID numbers to its staff for identification purposes. One employee has the ID number 12345.

Is the data qualitative or quantitative?

QUESTION

A city uses zip codes to organize mail delivery. The zip code 30301 is assigned to a particular neighborhood.

Is the data qualitative or quantitative?

