

1. Researchers want to know whether drinking coffee affects reaction time in adults. They record whether or not each participant drinks coffee daily (yes or no) and measure their reaction time (in milliseconds) using a computer test. Identify the variables in the study, and classify each as categorical or quantitative.
  
2. A researcher studies whether owning a pet is related to stress levels. She records whether or not each adult owns a pet (yes/no), and their score on a stress survey (0–50 scale). Sarah identifies the variables as owning a pet and the score on the stress survey.
  - a. One of Sarah's variables is incorrectly identified. Which one? Correct her mistake.
  
  - b. Classify each variable as categorical or quantitative. Explain.
  
3. In a recent study on walking and cardiovascular health, researchers analyzed data from 33,560 adults in the United Kingdom aged 40 to 79. Each participant wore a step-counter for one week to measure how many steps they took, and if those steps were accumulated in long or short walks. Researchers monitored these participants for 8 years, recording whether or not the subject developed cardiovascular disease. They found that people whose walking was concentrated in long walks had a lower incidence of cardiovascular disease, compared to those whose walking was concentrated in short walks.
  - a. Identify the population and sample.
  
  - b. Is this a retrospective study or a prospective study? How do you know?
  
  - c. Identify and classify the variable(s) in the study as categorical or quantitative.
  
  - d. Name at least one limitation for the study.

4. In a recent study on work patterns, researchers analyzed data from the American Time Use Survey, which collects detailed 24-hour time diaries from a large sample of U.S. adults each year. The study focused on workers in occupations with high exposure to generative AI tools like ChatGPT, comparing their time use before and after these tools became widely available. Researchers found that workers in jobs with high AI exposure actually worked about 3 hours more per week after the AI tools like ChatGPT became widely available.
- Identify the population and sample.
  - Is this a retrospective study or a prospective study? How do you know?
  - Identify and classify the variable(s) in the study.
5. A college basketball coach wants to analyze performance for the players on her team during the season. For the entire season, she records the total number of minutes played, points scored, and rebounds for every player on the team across all games. Which of the following best describes the data collection?
- A sample, because only basketball players were included.
  - An experiment, because the coach is measuring player outcomes.
  - A census, because data were collected from every player in the team's population.
  - A retrospective study, because the coach is using historical player data.
6. A sports reporter wants to estimate the average number of hours high school athletes in her state spend training each week. She randomly selects 60 high school athletes from schools across the state and surveys them about their weekly training time. Which of the following correctly identifies the population and the sample?
- Population: all students in the reporter's state; Sample: all athletes in the reporter's state
  - Population: all high school athletes in the state; Sample: the 60 athletes who were surveyed
  - Population: the 60 athletes who were surveyed; Sample: all high school athletes in the state
  - Population: all high school athletes in the country; Sample: all high school athletes in the reporter's state