

1. A local college has a total of 11,000 students planning to attend an upcoming school year, which includes 3,000 incoming freshmen. The athletic director wants to get an estimate of what percent of the incoming freshman want to purchase tickets for the football games. She takes a random sample of 400 freshmen and contacts them by email.
 - a. Identify the sample.
 - b. Identify the population.

2. A census is a survey in which every item or subject in the population is selected. Every 10 years, the U.S. Census Bureau completes a census to count every resident in the United States. Identify at least two challenges with conducting a census.

3. A city planner is researching a proposal for a new community building project that would require destruction of protected wetlands. The city planner creates a poll on social media to find out how people in the city feel about the proposal. 93% of the people who responded were against moving forward with the community building project.
 - a. What type of sampling method was used? Explain.
 - b. Explain how this sampling method might lead to bias.
 - c. Do you think 93% is higher or lower than the true percent of the people in the city that are against the community building project?

4. A group of entrepreneurs is thinking about opening a new business that provides remote workers with a shared workspace and good internet access. As part of their research, they interview people at several local coffee shops. Based on the interviews, they conclude that 85% of people in the city are remote workers.
- What type of sampling method was used? Explain.
 - Explain how this sampling method might lead to bias.
 - Do you think the 85% claim is higher or lower than the true percentage of the people in the city who are remote workers?
5. Apple uses a Net Promoter Score (NPS) to measure customer experience. The NPS measures the likelihood that a customer would recommend the company to someone else. Suppose an Apple store manager has a list of all 91 customers for one day at the store. She wants to take a random sample of 10 of these customers to estimate the NPS for the day.
- Describe a method for taking a simple random sample using a random number generator.
 - Describe a method for taking a simple random sample using names in a hat.

6. As part of a study by a certain medical association, hospital administrators and doctors will be asked about the new standards of care for elderly patients. From the 270,000 members, a random sample of 400 administrators and 800 doctors was selected. Of the 1,200 members selected, 1,100 members indicated they were familiar with the new standards. What are the population and the sample in this study?
- A) The population is the 1,200 members who were selected, and the sample is the 1,100 members who indicated they were aware of the new standards.
 - B) The population is the 1,200 members who were selected, and the sample is whether or not each member is familiar with the new standards
 - C) The population is the 270,000 members, and the sample is the 1,100 members who are familiar with the new standards.
 - D) The population is the 270,000 members, and the sample is the 1,200 who were selected.
7. In which of the following situations would it be most difficult to conduct a census?
- A) To determine what proportion of post office boxes are available for renting in the local post office
 - B) To determine what proportion of deer in a state are female
 - C) To determine what proportion of registered voters actually voted in the most recent school board election
 - D) To determine what proportion of licensed drivers in a small town own electric vehicles