Getting Ready for the Midterm – Chapter 1

Topics

You are responsible for the following:

- Determine whether a variable is qualitative or quantitative.
- Determine whether a quantitative variable is discrete or continuous.
- Determine the appropriate level of measurement for a set of data. (Nominal, Ordinal, Interval, Ratio)
- Identify the explanatory variable and the response variable in a designed experiment.
- Identify the sampling technique used in a given scenario – random, stratified, systematic, cluster, convenience

Practice Problems

Qualitative/Quantitative

Determine whether the variable is qualitative or quantitative.

1) Distance between a student's home and the college.

2) A student's favorite ice cream flavor.

Discrete/Continuous

Determine whether the quantitative variable is discrete or continuous.

3) Number of identity thefts in a city.

4) Height of a college student.

Levels of Data

Determine whether the following data is nominal-level, ordinal-level, interval-level or ratio-level data.

5) The colors of the marshmallows in a box of cereal

6) A college student's degree (Associate's, Bachelor's, Master's, etc.)

7) Temperatures of beers from a tap (°C)

8) Weight of a college student

9) Letter grades on an exam (A, B, C, D, F)

10) Percentage grade on an exam

11) Elevations of U.S. National Parks, in feet above/below sea level

12) Major in college (Mathematics, Biology, Psychology, etc.)

Explanatory/Response Variables

Identify the explanatory and response variable in the given designed experiment.

13) To determine whether fluoride is effective in preventing cavities, participants were divided into two groups. One group used a toothpaste containing fluoride, and the other group used a toothpaste that did not contain fluoride. After a 5-year period, the number of cavities for each participant was recorded.

14) A university wanted to determine whether adding a support class to Introductory Statistics would improve student understanding. Students were randomly assigned to a statistics class. Some classes had a support class, while the others did not. At the end of the semester, scores on a common final exam were recorded for each student.

Sampling Techniques

For the following scenarios, determine which sampling technique was used.

15) Percentage of 18- to 25-year-olds who used drugs during the past 30 days: At a shopping mall, people who appear to be in the proper age group are stopped and asked for their age and whether they've used drugs in the past 30 days.

16) Percentage of Master's degrees in Mathematics earned by females: Several universities are selected at random and asked for the number of Master's degrees awarded in Mathematics, and how many were awarded to females.

17) Average SAT score for females compared to males: Fifty students are randomly selected from a University's list of students. Their gender and SAT scores are recorded.

Systematic Sampling

18) A college has 16,000 students. The president of the college wanted to survey 200 students using systematic sampling.

a) Compute the step size, *k*.

b) If $p = 75$ was randomly selected as the starting point, list the first, second, third, and last (200^{th}) student included in the survey.