

# Written Homework Assignment for Chapter 10 & 11

## MATH-138 Online Statistics

**Directions:** On a separate sheet of paper, write out your solutions to the questions below. Then scan your written work, save it as a PDF file, and submit it on Canvas. Late assignments will receive a grade of zero unless prior arrangements are made with me.

**Assignment:** (16 points total)

- 1) Administrators at Texas A&M University were interested in estimating the percentage of students who are the first in their family to go to college. For each scenario below, identify the type of sampling method used by the university administrators. (5 pts)
  - a) Select several dormitories at random and contact everyone living in the selected dorms.
  - b) Send every registered student a text containing the survey question.
  - c) Using a computer-based list of registered students, contact 200 freshman, 200 sophomores, 200 juniors, and 200 seniors selected at random from each class.
  - d) Using a computer-based list of registered students, select one of the first 25 on the list by random and then contact the student whose name is 50 names later, and then every 50 names beyond that.
  - e) Using a computer-based list of registered students, contact 1000 students at random.
- 2) Using the same scenario above, name and describe the kind of bias that might be present if administrators: (4 pts)
  - a) Post a survey on the university website and ask students to fill it out.
  - b) Set up a table in the cafeteria every day for a week around breakfast time and ask students to fill out a survey.
- 3) A consumer research group wishes to assess the percentage of drivers in the U.S. 55 years of age or older who intend to purchase a hybrid in the next two years. They selected a systematic sample from a list of AARP members. Based on this sample, they estimated the percentage to be 15%. (4 pts)
  - a) What is the population of interest?
  - b) What is the population parameter of interest?
  - c) What is the sampling frame?
  - d) Does the 15% represent a parameter or a statistic?
- 4) A school district wants to understand how family income affects student performance on standardized tests like the SAT. They collect information from a random sample of test takers and examine the relationship between family income and SAT score. (3 pts)
  - a) This is a: (choose one)
    - Survey
    - Experiment
    - Prospective Study
    - Retrospective Study
  - b) What is the explanatory variable?
  - c) What is the response variable?