1.61 We want to describe the so-called typical student at your college. Describe a variable that measures some characteristic of a student and results in
a. Attribute data
b. Numerical data

1.62 A candidate for a political office claims that he will win the election. A poll is conducted and 35 of 150 voters indicate that they will vote for the candidate, 100 voters indicate that they will vote for his opponent, and 15 voters are undecided.
a. What is the population parameter of interest?
b. What is the value of the sample statistic that might be used to estimate the population parameter?
c. Would you tend to believe the candidate based on the results of the poll?

1.63 A researcher studying consumer buying habits asks every 20th person entering Publix Supermarket how many times per week he or she goes grocery shopping. She then records the answer as \( T \).
a. Is \( T = 3 \) an example of (1) a sample, (2) a variable, (3) a statistic, (4) a parameter, or (5) a data value?
b. Give an example of a question that can be answered using the tools of descriptive statistics.
c. Give an example of a question that can be answered using the tools of inferential statistics.

1.64 A researcher studying the attitudes of parents of preschool children interviews a random sample of 50 mothers, each having one preschool child. He asks each mother, “How many times did you compliment your child yesterday?” He records the answer as \( C \).
a. Is \( C = 4 \) an example of (1) a data value, (2) a statistic, (3) a parameter, (4) a variable, or (5) a sample?
b. Give an example of a question that can be answered using the tools of descriptive statistics.
c. Give an example of a question that can be answered using the tools of inferential statistics.

1.65 Consider the June 8, 2009, USA Today article titled “Credit Card Delinquencies Rise.”

### Credit Card Delinquencies Rise

The delinquency rate for bank-issued credit cards rose 11% in the first three months of the year, according to credit-reporting agency TransUnion. The delinquency rate jumped to 1.32% this year, from 1.19% in the first three months of 2008, TransUnion said. The statistic measures the percentage of card holders who are three months or more past due on their payments for Master-Card, Visa, American Express and Discover cards. The average total debt on bank cards also rose, jumping to $5,776 from $5,548 last year. Balances typically rise in the first quarter, as holiday spending comes due, said Ezra Becker, director of consulting and strategy in TransUnion’s financial services group. But retail sales results showed holiday spending took a steep drop. That likely means higher balances reflect consumers using credit cards to pay for necessities, he said.

**SOURCE:** Credit Card Delinquencies Rise,” USA Today, June 8, 2009. Copyright © 2009, USA Today. Reprinted with permission.

a. What is the population?
b. Name at least three variables that must have been used.
c. Classify all the variables of the study as either attribute or numerical.

1.66 Harris Interactive conducted an online poll of U.S. adults during August 2008 in anticipation of September being Library Sign-up Month.

### Library Card Use

These are some of the results of a Harris Interactive poll of 2,710 U.S. adults conducted online between August 11 and 17, 2008.

68% of Americans currently own a library card. Certain groups are more likely to have a library card than others——Echo Boomers (those 18–31) are more likely to have one over other age categories (70% versus 68–65%); women over men (73% versus 62%); Hispanics over African Americans and Whites (72% versus 67% and 66%); Midwesterners (72%) over Easterners (65%) and Southerners (63%).

Politically there is also a difference as Democrats are more likely to have a library card over Republicans and Independents (71% versus 67% and 61%).

Over one-third (35%) of people with a library card have used the library 1 to 5 times in the past year and 15% have used it more than 25 times in the past year.

**SOURCE:** http://www.harrisinteractive.com/harris_poll/

a. What is the population?
b. Name at least three variables that must have been used.
c. Classify all the variables of the study as either attribute or numerical.
1.67 The graphic below shows how 800 likely voters in April 2009 felt about using cameras to identify red-light runners. Would you classify the data collected and used to determine these percentages as qualitative (nominal or ordinal) or quantitative (discrete or continuous)? Why?

Do you Support Using Cameras to Identify Red-light Runners?

![Graphic showing support percentages]

SOURCE: Public Opinion Strategies survey of 800 likely voters, April 2009

1.68 Consider the May 12, 2009, USA Today article titled “Simulated Acupuncture Eases Pain.”

Simulated Acupuncture Eases Pain

Acupuncture brought more relief to people with back pain than standard treatments, whether it was done with a toothpick or a real needle, a study finds, but how acupuncture works remains unclear. In the study, 638 adults with chronic low back pain were divided into four groups and received standardized acupuncture treatment; individually prescribed acupuncture treatment; simulated acupuncture treatment using a toothpick in a needle guide tube that did not pierce the skin as regular acupuncture does but was targeted at correct acupuncture points; or standard medical treatment (medication and physical therapy). After eight weeks, 60% of those who got any type of acupuncture reported significant improvement compared with those who got standard care alone, says the study in this week’s Archives of Internal Medicine.


a. What is the population?
b. What is the sample?
c. Is this a judgment sample or a probability sample?
d. If this study is a probability sample, what type of sampling method do you think was used?

1.69 “Pull Down the Shades,” an article in the July 2009 Good Housekeeping magazine, presented the results of a study of 5000 people in Hawaii done by the University of Hawaii in Manoa. Data collected at beaches, parks, and pools in sunny Honolulu revealed that only 4 in 10 adults wear sunglasses to protect their eyes.

a. Was this study an experiment or an observational study?
b. Identify the parameter of interest.
c. Identify the statistic and give its value.

1.70 Barry Bonds played for the San Francisco Giants and near the end of his career was on pace to become baseball’s home run king. He joined Hank Aaron and Babe Ruth as the only Major League players to have hit more than 700 home runs in their careers. The graphic below is a look at how they amassed their totals.

Graphic and data for Problem 1.70

![Graph showing home run counts]

SOURCE: The Washington Post
a. Describe and compare the overall appearance of the three graphs. Include thoughts about such things as length of career, when the most home runs per year were hit and their relationship to the aging process, and any others you think of.
b. Does it appear that one of them was more consistent with annual home run production?
c. From the evidence presented here, who do you think should be called the “Home Run King”?
d. Was Barry Bonds’ 73 home runs in one season a fluke?
e. If you were a team owner and interested in home run production over the next several years, you would like very much to sign a player for your team that would duplicate which one of these players? Let’s say you were signing him at age 21. At age 35.

1.71 Describe in your own words and give an example of each of the following terms. Your examples should not be ones given in class or in the textbook.
   a. variable
   b. data
   c. sample
   d. population
   e. statistic
   f. parameter

1.72 Describe in your own words and give an example of the following terms. Your examples should not be ones given in class or in the textbook.
   a. random sample
   b. probability sample
   c. judgment sample

1.73 Find an article or an advertisement in a newspaper or magazine that exemplifies the use of statistics.
   a. Identify and describe one statistic reported in the article.
   b. Identify and describe the variable related to the statistic in part (a).
   c. Identify and describe the sample related to the statistic in part (a).
   d. Identify and describe the population from which the sample in part (c) was taken.

1.74 a. Find an article in a newspaper or magazine that exemplifies the use of statistics in a way that might be considered “entertainment” or “recreational.” Describe why you think this article fits one of these categories.
   b. Find an article in a newspaper or magazine that exemplifies the use of statistics and presents an unusual finding as the result of a study. Describe why these results are (or are not) “newsworthy.”

1.75 In Problem 1.6, you were asked to write a sentence for each of the three statistical activities given in the definition of statistics. Now that you have completed the chapter, review your work. Again, using your own words, change and/or enhance your work to complete a paragraph on the definition of statistics.