## 8.5 Problem Set 2

Question 7, page 380 14th Edition or **Cost of Dog Ownership**. Money reports that the average annual cost of the first year of owning and caring for a large dog in 2017 is \$1448. The Irish Red and White Setter Association of America has requested a study to estimate the annual first year cost for owners of this breed. A sample of 50 will be used. Based on past studies, the population standard deviation is assumed known with $\sigma = \$255$.

(a) What is the margin of error for a 95% confidence interval of the mean cost of the first year of owning and caring for this breed?

(b) The file Setters contains data collected from fifty owners of Irish Setters on the cost of the first year of owning and caring for their dogs. Use this data set to compute the sample mean. Using this sample, what is the 95% confidence interval for the mean cost of the first year of owning and caring for an Irish Red and White Setter?

Question 8, page 380 14th Edition or *Cost of Message Therapy Sessions*: Studies show that massage therapy has a variety of health benefits and it is not too expensive (*The Wall Street Journal*, March 13, 2012). A sample of 10 typical one-hour massage therapy sessions showed an average charge of \$59. The population standard deviation for a one-hour session is $\sigma = \$5.50$.

a. What assumptions about the population should we be willing to make if a margin of error is desired?

b. Using 95% confidence, what is the margin of error?

c. Using 99% confidence, what is the margin of error?

Question 18, page 389, 14th Edition: **Unemployment in Older Workers**: Older people often have a hard time finding work. AARP reported on the number of weeks it takes a worker aged 55 plus to find a job. The data on number of weeks spent searching for a job contained in the file JobSearch are consistent with the AARP findings.

a. Provide a point estimate of the population mean number of weeks it takes a worker aged 55 plus to find a job.

b. At 95% confidence, what is the margin of error?

c. What is the 95% confidence interval estimate of the mean?

d. Discuss the degree of skewness found in the sample data. What suggestion would you make for a repeat of this study?

Question 25, page 391, 14th Edition: **Computer-Assisted Training**: Refer to the Scheer Industries example in the previous class. Use 6.84 days as a planning value for the population standard deviation.

a. Assuming 95% confidence, what sample size would be required to obtain a margin of error of 1.5 days?

b. If the precision statement was made with 90% confidence, what sample size would be required to obtain a margin of error of 2 days?

Question 29, page 392, 14th Edition: Length of Theater Previews. Customers arrive at a movie theater at the advertised movie time only to find that they have to sit through several previews and pre-preview ads before the movie starts. Many complain that the time devoted to previews is too long. A preliminary sample conducted by The Wall Street Journal showed that the standard deviation of the amount of time devoted to previews was 4 minutes. Use that as a planning value for the standard deviation in answering the following questions.

(a) If we want to estimate the population mean time for previews at movie theaters with a margin of error of 75 seconds, what sample size should be used? Assume 95% confidence.

(b) If we want to estimate the population mean time for previews at movie theaters with a margin of error of 1 minute, what sample size should be used? Assume 95% confidence.

Question 35, page 396, 14th Edition or **Health-Care Survey**: The Consumer Reports National Research Center conducted a telephone survey of 2000 adults to learn about the major economic concerns for the future (Consumer reports, January 2009). The survey results showed that 1760 of the respondents think the future health of Social Security is a major economic concern.

(a). What is the point estimate of the population proportion of adults who think the future health of Social Security is a major economic concern.

(b). At 90% confidence, what is the margin of error?

(c). Develop a 90% confidence interval for the population proportion of adults who think the future health of Social Security is a major economic concern.

(d). Develop a 95% confidence interval for this population proportion.

Question 41, page 396, 14th Edition or **Driver's License Rates**: Fewer young people are driving. In 1995, 63.9% of people under 20 years old who were eligible had a driver's license. Bloomberg reported that percentage had dropped to 41.7% in 2016. Suppose these results are based on a random sample of 1200 people under 20 years old who were eligible to have a driver's license in 1995 and again in 2016.

(a) At 95% confidence, what is the margin of error and the interval estimate of the number of eligible people under 20 years old who had a driver's license in 1995?

(b) At 95% confidence, what is the margin of error and the interval estimate of the number of eligible people under 20 years old who had a driver's license

Question 63, page 396, 14th Edition or **Credit Card Ownership**. Credit card ownership varies across age groups. In 2018, CreditCards.com estimated that the percentage of people who own at least one credit card is 67% in the 18–24 age group, 83% in the 25–34 age group, 76% in the 35–49 age group, and 78% in the 50+ age group. Suppose these estimates are based on 455 randomly selected people from each age group.

(a) Construct a 95% confidence interval for the proportion of people in each of these age groups who owns at least one credit card.

(b) Assuming the same sample size will be used in each age group, how large would the sample need to be to ensure that the margin of error is .03 or less for each of the four confidence intervals?