Assignment - Chapter 11

Complete the following problems related to the chapter 11. Upload your work as a single PDF file before deadline. Use a $t-$ table or technology to calculate the critical score or $p-$values.

1. A study of all the students at a small college showed a mean age of 20.7 and a standard deviation of 2.5 years. Are these numbers statistics or parameters? Explain.

2. A random sample of 50 12th-grade students was asked how long it took to get to school. The sample mean was 16.2 minutes, and the sample standard deviation was 12.3 minutes. Find a 95% confidence interval for the population mean time it takes 12th-grade students to get to school. Would a 90% confidence interval based on this sample data be wider or narrower than the 95% confidence interval? Explain. Check your answer by constructing a 90% confidence interval and comparing this width of the interval with the width of the 95% confidence interval you found in part a.

3. A random sample of 25 men's resting pulse rates shows a mean of 72 beats per minute and a standard deviation of 13. Find a 95% confidence interval for the population mean pulse rate for men, and report it in a sentence.

4. Give as much information as you can about the p-value of a $t-$ test in each of the following situations:

   a. Upper-tailed test, df $= 8$, $t = 2.0$
   b. Lower-tailed test, df $= 10$, $t = -2.4$
   c. Two-tailed test, df $= 15$, $t = -1.6$
   d. Two-tailed test, $n = 16$, $t = 1.6$
   e. Two-tailed test, $n = 16$, $t = 6.3$

5. The true average diameter of ball bearings of a certain type is supposed to be 0.5 inch. What conclusion is appropriate when testing $H_0 : \mu = 0.5$ versus $H_a : \mu \neq 0.5$ inch in each of the following situations:

   a. $n = 13$, $t = 1.6$, $\alpha = .05$
   b. $n = 13$, $t = -1.6$, $\alpha = .05$
   c. $n = 25$, $t = -2.6$, $\alpha = .01$
   d. $n = 25$, $t = -3.6$

6. The weights of four randomly and independently selected bags of potatoes labeled 20 pounds were found to be 21.0, 21.5, 20.5, and 21.2 pounds. Assume Normality. Find a 95% confidence interval for the mean weight of all bags of potatoes. Does the interval capture 20.0 pounds? Is there enough evidence to reject a mean weight of 20 pounds?

7. According to Statista.com, the average price of a ticket to a Broadway show in 2017 was \$109.21. A random sample of 25 Broadway ticket prices in 2018 had a sample mean of \$114.7 with a standard deviation of \$43.3. Do we have evidence that Broadway ticket prices has increased from 2017 prices? Use a significance level of 0.05. Construct a 95% confidence interval for the price of a Broadway ticket. How does your confidence interval support your conclusion in part a?

8. According to Deadline.com, the aver- age price for a movie ticket in 2018 was \$8.97. A random sample of movie prices in the San Francisco Bay Area 25 movie ticket prices had a sample mean of \$12.27 with a standard deviation of \$3.36. Do we have evidence that the price of a movie ticket in the San Francisco Bay Area is different from the national average? Use a significance level of 0.05.