Statistics Exam III Review
Academic Skills Center
Fall 2019

1. Define the difference between a Type I and Type II error

2. A poll conducted among US citizens asked citizens to rate their stress levels on a scale of 1-10. The mean of their responses was 7.3 with a standard deviation of .67. The poll received 9,124 responses. Use this information to obtain a 95% confidence interval.

3. An experiment group, which consisted of 77 patients with calcific aortic stenosis, received 80 mg of atorvastatin daily. The change in their aortic-jet velocity over the period of the study had a mean increase of 0.199 meters per second per year. Assume a population standard deviation of 0.210 meters per second per year. Obtain and interpret a 95% confidence interval for the mean change in aortic-jet velocity of all such patients who receive 80 mg of atorvastatin daily. What is the required sample size to have a margin of error of .02, while retaining 95% confidence?

4. The average wait time in emergency rooms in the United States is 34.7 minutes. You want to conduct a hypothesis test to determine whether the average emergency room waiting times in Texas differs from the national average.

    a. Determine the null hypothesis
    b. Determine the alternative hypothesis
    c. Classify the hypothesis as left-tailed, right-tailed, or two-tailed.

5. 400 randomly selected emergency rooms in Texas have an average wait time 35.2 minutes. At the 5% significance level, does the data provide sufficient evidence to conclude that the average wait time in emergency rooms in Texas differs from the national average of 34.7 minutes? Assume the population standard deviation of the wait times in Texas is 5.4 minutes.

6. The burning of fossil fuels results in acid rain which affects the pH of lake water. Scientists measured the pH of high mountain lakes and reported their findings, trying to see if on average mountain lakes are non acidic(pH>7). What would a 99% confidence interval look like in the context of this problem? (Assume that the pH levels are normally distributed with a population standard deviation of 0.67)

7.2	7.3	6.1	6.9	6.6	7.3	6.3	5.5
6.3	6.5	5.7	6.9	6.7	7.9	5.8	6.1

7. A variable of two populations has a mean of 40 and a standard deviation of 12 for one of the populations and a mean of 40 and a standard deviation of 6 for the other population. Moreover, the variable is normally distributed on each of the two populations.(Assume independence of both populations)
    a. For independent samples of sizes 9 and 4, respectively, determine the mean and standard deviation of mean 1 - mean 2.
    b. Determine the percentage of all pairs of independent sample of sizes 9 and 4, respectively, from the two populations with the property that the difference mean 1 – mean 2 between the sample means is between -10 and 10.