Homework

Science, Statistics

Homework #5. 28 a. days, s 2 days, and n = 20 Using the t-statistic, as the sample size n = 20 30) is small. df = n 20 19 90% confidence interval is

A 90% confidence interval to estimate the population mean LOS for women in the state’s hospital is (3. 34 days, 4. 26 days).

b. We can say with 90% confidence that the population mean LOS for women for the state’s hospitals is between 3. 34 days and 4. 26 days. Thus, the state’s average LOS for women is below the average LOS for women in the United States of 4. 5 days.

c. The phrase “ 90% confidence interval” means that there will be 90% chance that this type of interval contain true mean. If the confidence level is 95%, then in the long run, 95% of the confidence intervals will contain population mean, μ and 5% will not contain μ.

#6. 40

a. Decision: Do not reject H0 at α = . 05.

Conclusion: No evidence average is less than 75.

b. Decision: Reject H0 at α = . 10.

Conclusion: There is evidence average is less than 75.

c. Decision: Reject H0 at α = . 10.

Conclusion: There is evidence average is more than 75.

d. Decision: Do not reject H0 at α = . 01.

Conclusion: No evidence average is not 75.

#7. 76

a. The null and alternate hypotheses are

The selected level of significance, α is . 10.

The selected test is F-Test for Equal Variances.

Numerator degrees of freedom,

Denominator degrees of freedom,

Below figure shows the critical values and rejection regions.

The test statistic is

Decision: Reject H0 at α = . 10

Conclusion: There is no evidence of a difference in variances.

b. p-value = 2*. 0785 = . 157

The approximate p-value of the test is . 157.

The large p-value of . 157 indicates that we would face a Type I error risk of about 15. 7 percent if we were to reject H0. In other words, a sample variance ratio as extreme as F = . 442 would occur by chance about 15. 7 percent of the time if the population variances were in fact equal. The sample evidence does not indicate that the variances differ.

#8. 50

a. Three blocks and five treatments were used in the experiment.

b = 2 + 1 = 3

k = 4 + 1 = 5

b. Fifteen observations were collected in the experiment.

n = bk = (3)(5) = 15

c. The null and alternate hypotheses I would used to compare the treatment means are

H0: μ1 = μ2 = … = μk

Ha: At least two treatment means differ

d. The test statistic, should be used to conduct the hypothesis test of part c.

e. At α = . 01, the rejection region for the test of part c and d is .

f. The test statistic is F = 9. 109.

Decision: Reject H0 at α = . 01

Conclusion: There is evidence population (treatment) means are different.

g. The assumption that are necessary to ensure the validity of the test I conducted in part f are

i) The b blocks are randomly selected, and all k treatments are applied (in random order) to each block.

ii) The distributions of observations corresponding to all bk block-treatment combinations are approximately normal

iii) All bk block-treatment distributions have equal variances.