Lesson 14: Inference for Several Means (ANOVA)

Homework

## Solutions

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| Problem | Part | Solution |
| 1 | - | ANOVA is a test for equality of several means. It allows us to compare the means for several groups in one hypothesis test. |
| 2 | - | a. An *F*-distribution is right skewed. A *t*-distribution is bell-shaped. b. The values of *F* are never negative. The values of *t* can be positive or negative. c. The P-value for the ANOVA test is always the area in the right tail in an *F*-distribution. We will never divide the area in the tail. The P-value for a *t*-test can be either the area under the right tail, the left tail, or both. |
| 3 | - | hist |
| 4 | - | **Elderly Females**: n = 11, mean = 0.528, Std. Dev. = 0.112 **Young Females**: n = 10, mean = 0.645, Std. Dev. = 0.099 **Elderly Males**: n = 8, mean = 0.654, Std. Dev. = 0.092 **Young Males**: n = 9, mean = 0.558, Std. Dev. = 0.145 |
| 5 | - | ANOVA |
| 6 | - | Yes, the requirements are satisfied. The requirements that were checked were the following: -The observations are normally distributed within each group. This was checked by creating histograms for each group. The sample sizes are small and this conclusion is subjective. QQEF QQYF QQEM QQYM -The variances are equal. This was checked by noting that the largest variance is not more than four times the smallest variance. |
| 7 | - |  |
| 8 | - | F = 2.932 df = 3 and 34 |
| 9 | - | P-value = 0.047 |
| 10 | - | P-value = 0.047 < 0.05 =  reject the null hypothesis |
| 11 | - | There is sufficient evidence to suggest that there is a difference in the mean protein requirements of the individuals in the four groups. |
| 12 | - | Hist12 |
| 13 | - | **Control**: n = 7, mean = 0.453, Std. Dev. = 0.391 **MON**: n = 7, mean = 0.521, Std. Dev. = 0.325 **SAFF**: n = 7, mean = 3.363, Std. Dev. = 0.774 **SAFF/MON**: n = 7, mean = 5.151, Std. Dev. = 0.729 |
| 14 | - | No, not all of the requirements are satisfied. The requirements that were checked were the following: -The observations are normally distributed within each group. This was checked by creating histograms for each group. The sample sizes are small and this conclusion is subjective. QQCON QQMON QQSAFF QQSAFFM -The variances are not equal. This was checked by noting that the largest variance is more than four times the smallest variance. |
| 15 | - |  |
| 16 | - | F = 106.217 df = 3 and 24 |
| 17 | - | P-value = 0 |
| 18 | - | P-value = 0 < 0.05 =  reject the null hypothesis |
| 19 | - | There is sufficient evidence to suggest that there is a difference in the mean CLA content in milk fat for at least one of the four diets. |
| 20 | - | It would be worth figuring out which of the diets produced the highest CLA content and then possibly encouraging the use of that diet more than the others. |