Lab: Hypothesis Tests for C-Q Relationships Report

Include answers to the following questions in an electronic document that you can email to me or print out and submit to your instructor in paper format.

Questions from the Guided Practice

Answer the remaining questions using the Gradebook data. Previous examples in the guided practice will help you answer the questions below.

1. What is the mean number of hours undergraduates sleep? Graduates?

2. What is the test statistic and the p-value for the hypothesis test comparing whether graduate students sleep less than undergraduates? Write the appropriate statistical sentence stating the conclusions of this test and include the output from the statistical software supporting your answer.

3. Are the standard deviations similar enough to use an ANOVA on the data on the flicker frequency and eye color data? What is the appropriate measurement to check this assumption? Include your comparison of the standard deviations.

4. Does eye color have a significant effect on the threshold sensitivity to flickering light? Provide the ANOVA output and identify the test statistic along with the p-value. What is the appropriate conclusion of this test? Include the appropriate statistical sentence.

At the end of the semester, an "Introduction to Statistics" instructor wanted to gain insight into his students' performance by analyzing gradebook data. The instructor taught 3 large lecture sections offered at different times during the day. Since each section, depending on the time it was taught, attracted different types of students (in terms of major, age, full-time/part-time, etc.) the instructor chose a random sample of 35 students from each section to insure proper representation.

The variables in the gradebook data are:

Midterm1: Student's score on the first midterm (0-100 scale)

Midterm2: Student's score on the second midterm (0-100 scale)

Diff.Mid: The difference between the two midterm exam scores (midterm1 - midterm2)

Extra credit: Did the student turn in the extra credit assignment? (0=NO, 1=YES)

Final: Student's score on the final (0-100 scale)

Class: Student's class (1=Freshman, 2=Sophomore, 3=Junior, 4=Senior)

Using the tools you learned in the guided practice answer the following questions and include all necessary supporting information including graphs and tables.

5. Out of the first ten students in the datafile, how many students turned in the extra credit?

6. Out of the first ten students in the datafile, how many students did better on the first midterm than the second midterm?

7. What is the final score of the first junior in the datafile who did not turn in the extra credit?

8. Answer the following question using the appropriate statistical tool. When using a hypothesis test report the test statistic and the p-value. Include any supporting output and the appropriate statistical sentence.

   Do the data provide evidence that the students who did not do the extra credit assignment (group 1) performed significantly worse on the final than those who did (group 2)?

9. Answer the following question using the appropriate statistical tool. When using a hypothesis test report the test statistic and the p-value. Include any supporting output and the appropriate statistical sentence.

   The material covered by the second midterm is harder than the material covered in the first. Is this reflected by the students' grades?

10. Answer the following question using the appropriate statistical tool. When using a hypothesis test report the test statistic and the p-value. Include any supporting output and the appropriate statistical sentence.

    Do the data provide evidence for a significant "class effect" on final performance?