

STAT 2300 - Homework 6

Reading

Read Chapter 5

Conceptual Exercises

(don't hand these in - answers are at the end of the chapter)

Chapter 5 # 11

R Exercises

These are modifications of problems from Chapter 5. Hand these in as a knit Markdown document

Problem 23

Complete this problem and also make a boxplot showing the Oxygen distribution for each Bone.

Problem 24

Make a boxplot showing the distribution of Income2005 for each IQquartile. Observe that the variance is not constant - higher incomes have larger spread. Make a new boxplot showing the log of Income2005, and use the logarithm of Income2005 in your ANOVA.

Problem 25

Like problem 24, the Income2005 needs to be logged. Make a boxplot showing the log of Income2005 for each group, *and reorder the education groups* so that "<12" is the first group in the plot, as it should be. Finish the problem using the logarithm of Income2005.

Problem 18

Make a boxplot showing all ten TrdDayGroup protein distributions, and color by Treatment so it's clear which boxes go with which treatments. Re-order the groups so that they appear in order from 1 to 10.

For part a, just calculate the ANOVA F-test to see whether the six treatments have different means. (The actual question wants you to realize that ignoring the treatment day is a problem, since the control group protein level clearly changes from day-to-day. But this is clear from looking at the boxplot.)

Finish with parts b and c.

Problem InsectSprays

The built-in data set `InsectSprays` records the counts of living insects in agricultural experimental units treated with different insecticides.

- Plot the data. Three of the sprays seem to be more effective (less insects collected) than the other three sprays. Which three are the more effective sprays?
- Use one-way ANOVA to test if the three effective sprays have the same mean. What do you conclude?
- Use one-way ANOVA to test if the three less effective sprays have the same mean. What do you conclude?
- Would it be appropriate to use one-way ANOVA on the entire data set? Why or why not?
- Use `oneway.test` to test the null hypothesis that all of the mean insect counts are the same for the various sprays versus the alternative that they are not, at the $\alpha = .01$ level.