Homework 9

Instructions

Answer all questions stated in each problem. Discuss how your results address each question.

Submit your answers as a pdf, typeset (knitted) from an Rmd file. Include the Rmd file in your submission. You can typeset directly to PDF or typeset to Word then save to PDF In either case, both Rmd and PDF are required. If you are having trouble with .rmd, let us know and we will help you. If you knit to Word, check for any LaTeX commands that will not be compatible with Word.

This file can be used as a template for your submission. Please follow the instructions found under "Content/Begin Here" titled **Homework Formatting**. No code should be included in your PDF submission unless explicitly requested. Use the `echo = F` flag to exclude code from the typeset document.

For any question requiring a plot or graph, answer the question first using standard R graphics (See ?graphics). Then provide a equivalent answer using `library(ggplot2)` functions and syntax. You are not required to produce duplicate plots in answers to questions that do not explicitly require graphs, but it is encouraged.

You can remove the `Instructions` section from your submission.

Exercises

1. (Question 15.1 on pg. 295 in HSAUR, modified for clarity) Consider **alpha** dataset from the **coin** package. Compare the results when using **glht** and TukeyHSD (Refer to Chapter 5 for TukeyHSD).
2. (Question 15.2 on pg. 296 in HSAUR, modified for clarity) Consider **clouds** data from **HSAUR3** package

a. Read and write a report (no longer than one page) on the clouds data given in Chapter 15 section 15.3.3 from HSAUR Ed 3.

b. Consider the linear model fitted to the clouds data as summarized in Chapter 6, Figure 6.5. Set up a matrix K corresponding to the global null hypothesis that all interaction terms present in the model are zero. Test both the global hypothesis and all hypotheses corresponding to each of the interaction terms.

c. How does adjustment for multiple testing change which interactions are significant?

3. (Question 15.3 on pg. 296 in HSAUR, modified for clarity) or the logistic regression model presented in Chapter 7 in Figure 7.7, perform a multiplicity adjusted test on all regression coefficients (except for the intercept) being zero. Do the conclusions drawn in Chapter 7 remain valid?