

Homework 6 (due: 3/26/2014)

1. How does social isolation during a critical development period affect the behavior of hooded rats? Psychology students assigned 24 young female rats at random to either isolated or group housing, then similarly assigned 24 young male rats. This is a randomized block design with the gender of the 48 rats as the blocking variable and housing type as the treatment. Later, the students observed the rats at play in a group setting and recorded data on three types of behavior (object play, locomotor play, and social play). The file ex26-10.txt records the time (in seconds) that each rat devoted to social play during the observation period.
 - a) Make a plot of the 4 group means. Is there a large interaction between gender and housing type? Which main effect appears to be more important?
 - b) Verify that the conditions for ANOVA inference are satisfied.
 - c) Conduct ANOVA analysis using R. What are the F statistics and P values for interaction and the two main effects? Do these values support your tentative interpretation of the graph?
2. What color should we use on sticky boards placed in a field of oats to attract cereal leaf beetles? The data in eg24-04.txt describe an experiment in which 24 boards, 6 blue, green, white, and yellow, were placed at random locations in a field.
 - a. Conduct one-way ANOVA analysis and construct ANOVA table.
 - b. If we suspect that 1) warm colors are generally more attractive than cold colors; 2) The blue and white boards would have similar properties; 3) green and yellow would give similar results; 4) the average beetle count for green and yellow would be greater than the average count for blue and white. What are the null and alternative hypotheses that you want to test? Conduct the t test using Contrast.