Math 158, Spring 2009
Jo Hardin
semester project (part 4)
Due Tuesday, April 21st

ANOVA

Your task for this project is to apply the tools we've learned in chapters 16 - 19 (Analysis of Variance) to answer questions about the differences in means across categorical groups. The report should include:

- Introduction (Briefly refresh the reader's mind as to the variables of interest)
- The hypotheses that you'll be addressing. The original null hypothesis will be that the means across 3 or more groups are equal.
- You'll also be hypothesizing about a subset of the large number of groups. (I.e., you will combine some of the groups like we did with the mice data.) The hypotheses need to be in the paper, but you can write them down in a natural place (they don't both have to come immediately after the introduction – the key to a good paper is telling a good story.)
- The ANOVA table(s) and a description of the pertinent items.
- Any graphs (boxplots?) that you think give evidence to the point you're making (story you're telling with the data.)
- After running your hypothesis test, compare or contrast means across groups. Depending on your comparisons (planned? unplanned?) adjust for multiple comparisons. Justify your choice of adjustment for multiple comparisons. (Give at least one linear combination that is not a pairwise comparison.)
- Diagnostics: check your model assumptions using residual plots and consider possible transformations (see section 18.5)
- Run a 2-way ANOVA using 2 categorical variables. Check for interaction. Include a plot of treatment means (see figure 19.7, page 829). Suggest a strategy for analysis given your interaction results (see section 19.7, pgs 847-848).
- A Conclusion (Summarize your results. Comment on anything of interest that occurred in doing the project. Were the data approximately what you expected or did some of the results surprise you? What other questions would you like to ask about the data?)

Notes:

- Summarize any output from R. Do not turn in the print outs, but make new tables and summarize so that it flows nicely in the text. I don't need to see the technical calculations.
- I've asked you to do a series of things above, make sure the sections flow nicely into one another. This is a report on the data not a homework assignment. (Try to tell a good story.)

- Do not be tempted to turn in everything you do. Only turn in the interesting parts of the analysis. One of the hardest parts of being a consultant is figuring out what to tell the researcher.
- Computer output that is attached and not described will be ignored.
- Please double space your work.
- Turn in the previous projects with this project. (But let this assignment stand alone, that is, don't expect me to remember your variables.)
- Remember to label all graphs, email me if you are having trouble in R with labels (or really, any troubles in R!)