Stat 445/545 Project Writing Instructions:

Reports should be typed, and printed out. In your data analyses, RAW AND UNINTERPRETED COMPUTER OUTPUT IS UNACCEPTABLE. When you include computer output in your reports, you must cut and paste it and interpret it. You should have a caption by every figure and table that describes it and tells me briefly what you see. For example, If you wanted to include the R output giving the multiple comparisons, you would give it a caption, something like "Figure 1. R output for multiple comparisons for the ** data, using the Tukey method for multiple comparisons. The confidence intervals indicate that the **** have significantly less *** than the ***, at an experimentwise error rate of .05."

When writing "professional reports," it may be helpful to pretend that you are writing up the results of your data analyses for someone who has paid you to analyze the data. Remember that even that best data analysis is worthless if your reader cannot understand it. The following are suggested format of your report.

Your project will consist of seven parts: summary, key graphs, introduction, Material and Methods/Experimental Design, Results of the Analysis, conclusions and appendix. In the following, I will describe what I expect for each part.

Summary: In this section, you will describe the results of the analyses. The summary should state the problem concisely, show what you found, and briefly interpret the results. A good rule to keep in mind is that a person who has only had an introductory statistics course should easily be able to understand the summary and grasp the results of your analysis.

Key Graphs: YOU MUST ALWAYS INCLUDE AT LEAST ONE PLOT OF THE DATA. For example, profile plots, hasse diagram, cube plots etc. And of course, every plot you include must contain a complete caption telling me what you see.

Introduction: Give the background of the problem, with more detail than in the summary. State the goals of the study. At the end of this section, tell briefly what you plan to say in subsequent sections.

Material and Methods/ Experimental Design: A brief description of how the data were collected and what kind of statistical tools you want to use to address the problem you stated.

Results of the Analysis: In this section, tell the reader what you found and how you found it. You may need to paste some outputs (not the raw output) from your code work to facilitate your explanation. For example, you may include a table of the results of F test in the

text. And usually, you will include the residual plots in the appendix. Organize the section to tell the story you uncovered, not the circuitous path you may have taken to get there. Interpret your results. Report any strange features of the data.

Be sure that you address each of the study's goals: if the experimenter wants to know which treatment is best, you should attempt to answer that question and not just report the results of an F test saying that the treatment means are different at the 5% level. You may also mention strange qualities of the data and give suggestions for improving the data quality should future studies be done. Figures and tables may be used to tell a large part of the story, if possible.

Conclusions: You should provide interpretation of the statistical results throughout the report and rehash the main results concisely in the Conclusion, using different wording than the summary. You may also include ideas you have about future studies.

Most people tend to read the summary and conclusions first, then look at the figures and tables. Then, if they have further interest, they read other sections of the report. Consequently, your summary and conclusion should be understandable by someone who has not read the rest of the paper, and all figures and tables should have complete captions.

Appendix: Contains the technical details and plots not found in the Results section that you want your readers to know. Also include your R code in the Appendix, so I can see what you did in case you get a strange answer.