

Fall 2013 - STAT 518 – Project -- Part I

Real Data Analysis: Parametric vs. Nonparametric

The eventual goal of this assignment is to analyze some real data set using both a nonparametric approach and a parametric approach. The data can either be from a sample, a survey, or an experiment. They may be real data you found in a published (traditional or online) source (not the textbook, and not one that has already analyzed the data!) or may be data you gathered yourself. The data should be at least ordinal, but it is better that they be at least interval in measurement scale to facilitate comparisons between approaches. The data set and research question should be of the type that could be analyzed using the methods we have studied in STAT 518.

For this preliminary part, you should describe in a page or so:

- (1) the individuals in your sample**
- (2) the actual data values themselves**
- (3) the research question you will answer, including the null and research (alternative) hypotheses**
- (4) two suggested approaches for answering the research question (one should be nonparametric and one should be a classical parametric approach)**
- (5) a normal Q-Q plot of either (a) the data, (b) the differences, if it is a paired sample situation, or (c) the residuals, if it is a regression situation. See me for help if you are unsure about this.**
- (6) your conclusions about the nature of the data based on the Q-Q plot. Are the data approximately normal? Heavy-tailed? Light-tailed? Skewed to the left? Skewed to the right? Or are they ordinal?**

This part is due by November 6, 2013.

For the final project report, you will not only analyze your data set using both approaches and write up your conclusions, but also perform a simulation study in R to approximate the power of each procedure on simulated data that has similarities to your real data set. This will allow you to make conclusions about which approach is preferable to analyze your data. More information will be given about the simulation study and final written project report later.

Grading:

The project will be graded out of 30 points, of which this preliminary part is worth 10 points. As an encouragement for working in groups, you will get 2 bonus points if you work in a group of two people. When working in groups, each member must contribute significantly to the project.