Statistics 512: Homework#12
Due May 2, 2014 BEFORE 10:30am

For the next three problems use the Rehabilitation therapy data of problem 22.11 (`CH25PR11.DAT`) in the text (also see the description in Problem 16.9).

1. Analyze this data using a one-way ANOVA model, ignoring patient age. Summarize your conclusions from this analysis.

2. Analyze the data using a one-way ANCOVA model with patient age as a covariate. Show appropriate graphs and summarize your conclusions from this analysis.

3. Explain any differences in your conclusions from the two analyses. (You should say what those differences are and also explain why they happened.)

For the the next two problems use the Coil winding data of Problem 25.9 (`CH24PR09.DAT`) in the text.

4. Analyze this data using the random effects model. Test the null hypothesis that the mean coil winding characteristic is the same in all machines (i.e. test whether $\sigma_\mu^2 = 0$) . Interpret the results of your analysis.

5. Give a point estimate of the intraclass correlation coefficient $\frac{\sigma_\mu^2}{\sigma_\mu^2+\sigma^2}$.

6. A Marketing consultant is designing several experiments involving a newly developed low-cost food processor. The initial experiment has the objectives (1) to compare the effects on unit sales of three possible prices recommended by the sales department ($23.99, $25.49, $25.95) and (2) to determine whether the color scheme used for the appliance affects unit sales. A great many color schemes are feasible; three (white, green, pink) have been selected for the initial experiment to represent the range of possible colors. If the experiment suggests that color scheme does have an effect, this aspect of the product design will be investigated in detail in a follow-up study. Which ANOVA model would you employ for analyzing the initial experiment? Describe the model, state the hypotheses you would test, and also state the test statistics and decision rules.