Note: You are welcome to use a computer to carry out the numerical calculations in these problems. I suggest using a high-level matrix oriented language such as MATLAB, GAUSS or SPlus. You could also use MINITAB or SAS for your data analysis. If you use a computer, please hand in your program with your homework and explain in your homework solution what your program was doing.

1. Use the electricity usage data and regress log(kwh) on log(temp). Plot the least squares line from the minimum to the maximum values of log(temp) in the data set. Include in the plot, simultaneous 95% confidence limits for the true regression line using Scheffé’s method. In other words, plot the least-squares estimate of $\hat{\beta}_0 + \hat{\beta}_1 \text{log(temp)}$ and its upper and lower Scheffé limits as functions of temp. This data set is on the course web site.

   I suggest that you use MATLAB to do the computations and plotting. Ask for help if you are having trouble with MATLAB. F quantiles can be computed if your version of MATLAB has the stats toolbox. Otherwise, you need to find the appropriate F quantile from a table or MINITAB, for example, and put it into your program.

2. Do exercise 4.3.2 in the textbook. I suggest that you use SAS. (This data set is on the course web site—it was typed by an altruistic student. Let me know if you find a typing error).