Math 484: Lab 4 Monday, Nov. 14. As with HW 10, use *source* commands **to download the programs**, and **to download the data**.

A) 5.11 with new d). Type `anovasim` to see the program. Type `args(anovasim)` to see the arguments for the program.

a) Get the coverages for the following command. Since the four population means and the four population standard deviations are equal, want the coverages to be near or less than 0.05. Are they? anovasim()

b) Get the coverages for the following command. The population means are equal, but the population standard deviations are not. Are the coverages near or less than 0.05? anovasim(sd2 = 2, sd3 = 3, sd4 = 4)

c) Now use the following command where H_0 is false: the four population means are not all equal. Want the coverages near 1. Are they? anovasim(m4 = 1)

d) Now use the following command where H_0 is false. Want the coverages near 1. Since the σ_i are not equal, the Anova F test is expected to perform poorly. Is the Anova F test the best? anovasim(m4 = 1, sd4=9)

B) 4.2 type **wlsplot(x=dsx, y = dsy, w = dsw)** to reproduce Figure 4.1.

C) 4.3 a) Type the following command several times. The OLS and WLS plots tend to look the same.

```
fwlssim(type=1)
```

b) Type the following command several times. Now the FWLS plots often have outliers.

```
fwlssim(type=2)
```

c) Type the following command several times. The OLS residual plots have a saddle shape, but the WLS plots tend to have highly skewed fitted values.

```
fwlssim(type=3)
```

d) Type the following command several times. The OLS residual plots have a saddle shape, but the FWLS plots tend to have outliers and highly skewed fitted values.

```
fwlssim(type=4)
```

D) 3.17 Get the Joanne Numrich data *c12.lsp* from (www.math.siu.edu/olive/regbk.htm), and save the file on a disk. Activate the *c12.lsp* dataset with the menu commands "File > Load > 3 1/2 Floppy(A:) > c12.lsp." Scroll up the screen to read the data description. This data set is described in Example 3.10.

a) A bad model uses Y_1 and all 24 nontrivial predictors. There are many indicator variables. Click on the *CLA* menu and select *Transform*. Click on the *log transformations* button and select y_1. Click on *OK*.

b) Use the menu commands "Graph&Fit > Fit linear LS". Select log[y1] for the response. For the terms, select x1, x2, x8, x9, x11, x18, x20, x23 and x24. Click on *OK*.

This model will be used as the full model. To make the response plot use the menu commands "Graph&Fit >Plot of". Select log[y1] for the V-box and L1:Fit-Values for the H-box. Click on *OK*. When the graph appears, move the OLS slider bar to 1 to add the identity line. Copy the plot into *Word*.

To make the residual plot use the menu commands "Graph&Fit >Plot of". Select L1:Residuals for the V-box and L1:Fit-Values for the H-box. Click on *OK*.

c) Use forward selection, backward elimination and plots to find a good submodel.