Arc is the free software available from (www.stat.umn.edu/arc/). The software goes with the book Cook, R.D., and Weisberg, S. (1999a), *Applied Regression Including Computing and Graphics,* Wiley, NY. Problems in my two online texts (http://parker.ad.siu.edu/Olive/ol-bookp.htm) and (http://parker.ad.siu.edu/Olive/regbk.htm) also use Arc.

To get in ARC, send your cursor to the math progs folder, click right mouse button twice, move cursor to ARC, double click, move cursor to ARC, double click. These menu commands will be written "math progs > ARC > ARC." To quit ARC, move cursor to the **x** in the northeast corner and click.

One way ANOVA in ARC. This data set contains IQ scores on 27 pairs of identical twins, one raised by foster parents IQf and the other by biological parents IQb. C gives the social class of the biological parents: $C = 1$ for upper class, 2 for middle class and 3 for lower class. Hence the Anova test is for whether mean IQ depends on class.

a)Activate *twins.lsp* dataset with the menu commands
"File > Load > Data > ARCG > twins.lsp".

b) Use the menu commands "Twins>Make factors, select C and click on *OK.* The line "{F}C Factor 27 Factor–first level dropped" should appear on the screen.

c) Use the menu commands "Twins>Description" to see a description of the data.

d) Enter the menu commands "Graph&Fit>Fit linear LS" and select {F}C as the term and IQb as the response. Highlight the output by pressing the left mouse key and dragging the cursor over the output. Then use the menu commands "Edit> Copy." Enter *Word* and use the menu commands "Edit>Paste."

e) Enter the menu commands "Graph&Fit>Boxplot of" and enter IQb in the *selection box* and C in the *Condition on* box. Click on *OK.* When the boxplots appear, click on the *Show Anova* box. Click on the plot, hit the *Ctrl* and c keys at the same time. Enter *Word* and use the menu commands "Edit>Paste." Include the output in *Word.* Notice that the regression and Anova F statistic and p-value are the same.

f) Residual plot: Enter the menu commands "Graph&Fit>Plot of," select "L1:Fit-Values" for the "H" box and "L1:Residuals" for the "V" box, and click on "OK." Click on the plot, hit the *Ctrl* and c keys at the same time. Enter *Word* and use the menu commands "Edit>Paste."

g) Response plot: Enter the menu commands "Graph&Fit>Plot of," select "L1:Fit-Values" for the "H" box and "IQb" for the "V" box, and click on "OK." When the plot appears, move the OLS slider bar to 1 to add the identity line. Click on the plot, hit the *Ctrl* and c keys at the same time. Enter *Word* and use the menu commands "Edit>Paste."