Stat 512 – 1 **Homework #8** **Dr. Levine**

Please use the dataset from Problem 16.11 described on page 725 of KNNL (ch16pr11.txt). for all of the questions below. This analysis will be continued on the next homework set (#8), so be sure to save your SAS code.

1. Give a table of sample sizes, means, and standard deviations for the six different filling machines.
   (a) Based on this table, does the constant variance assumption appear to hold?
   (b) Based on this table, do the six machines appear to give the same average amount of detergent?
2. Make a plot of the means (with i=join) overlaid on a plot of the individual observations (with i=none) versus filling machine number.
   (a) Based on this plot, does the constant variance assumption appear to hold?
   (b) Based on this plot, do the six machines appear to give the same average amount of detergent?
3. Examine the question of whether or not the six machines give the same average amount of detergent.
   (a) Write the cell means model for this analysis. State the null and alternative hypotheses in terms of the cell means model parameters, give the test statistic with degrees of freedom, the P-value and your conclusion.
   (b) Write the factor effects model for this analysis. State the null and alternative hypotheses in terms of the factor effects model parameters, give the test statistic with degrees of freedom, the P-value and your conclusion.
4. Show that when the number of treatments r=2, the test employing F statistic $F^* = \frac{MSTR}{MSE}$ is the equivalent of the two-population, two-sided t test. What is the number of degrees of freedom for each of the two distributions? Explain.