Statistics 512: Homework 7
Divisions 4 and 5: Due 11:59pm, Monday, April 24, 2017

A reminder – Please do not hand in any unlabeled or unedited SAS output. Include in your write-up only those results that are necessary to present a complete solution. In particular, questions must be answered in order (including graphs), and all graphs must be fully labeled (main title should include question number, and all axes should be labeled). Don't forget to put all necessary information (see course policies) on the first page. Include the SAS input for all questions at the very end of your homework. You will often be asked to continue problems on successive homework assignments. So save all your SAS code.

Important Note *– Every graph or plot you create should have your name printed as a subtitle. Consequently, any graph with no name will result in a* **20% points off** *on that question. Also, please attach your code at the end; any homework with no code provided will result in a* **50% points off** *on the entire assignment, NO EXCEPTIONS.*

Use the dataset from Problem 16.11 described on page 725 (white text) or page 739 (blue text) of KNNL (`ch16pr11a.dat`).

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.