Homework # 8
Due Wednesday April 13, 2017

1. Problem 6.8 in Johnson & Wichern, p 338. Do any computations using IML or your favorite matrix computer program.

For part (c), you do not have to do Bartlett’s correction.

Add

(d) The MANOVA model can be expressed in terms of the multivariate general linear model, $X = AB + e$. Provide two possible versions of the design matrix $A$.

(e) For each design matrix, given in part (d)
   (a) Estimate $B$
   (b) Estimate the residuals.
   (c) Compute the cell means (i.e., $\hat{X} = A\hat{B}$).

(f) Compare the estimates obtained in all parts of this problem.

2. Baten, Tack, and Baeder (1958) compared judge’s scores on fish prepared by three methods. Twelve fish were cooked by each method, and several judges tasted the fish samples and rated each on four variables: $y_1 =$ aroma, $y_2 =$ flavor, $y_3 =$ texture, and $y_4 =$ moisture. The raw data are given below and will be mailed to you. Each entry is an average score for the judges on that fish. You can use PROC GLM and/or IML for this problem.

(a) Compare the three methods using MANOVA.

(b) Using multivariate contrasts, test the following two comparisons:
   • Methods 1 and 2 versus 3
   • Method 1 versus 2

(c) Compute simultaneous confidence intervals for each of the variables comparing methods
   • 1 and 2 versus 3
   • 1 versus 2
(d) If the test in part (a) is significant, run an ANOVA F-test on each $y_i$ (and appropriate univariate follow-up procedures).

(e) Using the results from parts (a), (b), (c) and (d), write a short summary of what you found out about the methods of cooking fish.