Homework 2; Due date: February 19

Explain your answers.

Just writing the answer in the back of the book, or writing a Y/N does not give any credit.

1. Consider the data from Problem 3.8 p.115 in the text, and answer the following questions.
   (a) Obtain the ANOVA table and do the test of $H_0$ of equal means.
   (b) Test
   \[ H_0 : \frac{\mu_1 + \mu_5}{2} = \frac{\mu_2 + \mu_3 + \mu_4}{3} \]
   at level of significance $\alpha = 0.05$
   (c) Obtain a 95% C.I. for the contrast in (b).
   (d) Give the total number of (meaningful) contrasts.
   (e) Give a maximal set of mutually orthogonal contrasts.
   (f) How many possible contrasts are there if you use Scheffe’s method for multiple comparisons’ methods?
   (g) How many possible pairs can be obtained if you want to use Tukey’s method?
   (h) Compare all possible pairs by Tukey’s method, Scheffe’s method, and Bonferroni’s method at 90% C.I. Which method gives the shortest interval? Which gives the worst?
   (i) What is your recommendation?

2. Problem 3.16 p. 116
3. Problem 3.19 p. 117
4. Problem 3.26 p. 118
5. Problem 3.29 p. 119
6. Problem 3.36 p. 119

7. Problem 3.37 p. 119

8. The data corn contains the information from test to find useful practice in growing corn. Ears are particular components that dictate when the steps from pollination to harvest. Other components that are useful are the randomly selected sites (here 8 sites) and at 4 randomly selected parcels within each site. So there are 2 sources of variation: variation among the sites and among parcels. The response is the number of ears.

   (a) Write the model of the number of ears based on the sites. Write model assumptions. Give the overall mean and give the estimates of the parameters.

   (b) what proportion of the variation is due to the sites?

   (c) What is the confidence interval of the difference in ears based on sites WLAN and WEAN?

   (d) Add the parcels in the model and give the equation and estimates of the parameters.

   (e) What is the variance for the difference of two parcels? Explain.

Let me know if you have any questions.