Assignment 6

(Due Thursday Oct 20)

1. The tensile strength of portland cement is being studied. Four different mixing techniques are commonly used in producing the cement. The following data (cement.dat) are collected from an experiment that is conducted to investigate the four techniques.

```
mixing tensile
1 3129 1 3000 1 2865 1 2890
2 3200 2 3300 2 2975 2 3150
3 2800 3 2900 3 2985 3 3050
4 2600 4 2700 4 2600 4 2765
```

a). Test if the mixing techniques have different effects on the strength of the cement. Use $\alpha = 5\%$

b). What is the least difference two treatment sample means should have so that they can be declared to be significantly different from each other, if you use

b1. the LSD comparison procedure?

b2. Tukey's method?

b3. Bonferroni's method?

b4. Scheffe's method?

c). Report the results using each methods. Explain the relationship between power and critical difference. Which of the four is the most powerful and which is the most conservative?

2. Recall Problem 1 in Assignment 3. Compare the treatments (the four different pesticides) with the control at $\alpha = 5\%$ using

a). the Bonferroni method.

b). Dunnet's method (Table IX or Table VIII in Montgomery)

c). Compare the results in a) and b).