Homework 4
Due: Thursday, Oct 25, 2001

- **Reading.** The current material on ANOVA models is most like what is in RPD, Chapters 9 and 17. This will become more obvious on Tue Oct 23 (I hope!).

- **Problems to be turned in:**

1. RPD, p. 150, #4.3.

2. RPD, pp. 157–158, #4.12

3. In a regression study, three types of banks were involved, namely, commercial, mutual savings, and savings and loan. Consider the following system of indicator variables for type of bank:

```
           Type of Bank       X2     X3
----------------------------------------
             Commercial        1      0
         Mutual Savings        0      1
       Savings and Loan       -1     -1
```

   (a) Develop a first–order linear regression model for relating last year's profit or loss (Y) to size of bank (X_1) and type of bank (X_2,X_3).

   (b) State the response functions for the three types of banks.

   (c) Interpret each of the following quantities: (1) β_2, (2) β_3, (3) $-\beta_2 - \beta_3$.

4. RPD, p. 233, #7.13. You can essentially repeat your solution for #3.13 from HW#3 for part (a). After you finish this exercise, write *one* paragraph entitled: *Whether to include more regressors: the bias/variance tradeoff for coefficients of regressors already in the model.* Audience: yourself (and me, of course). Write what you would want to remember about this in five years when you are teaching a regression course yourself and you come to this issue in your course.

5. Think about RPD, p. 204, #6.9. *You don't have to turn anything in for this question.*