STAT 8260 — Theory of Linear Models
Homework 4 – Due Thursday, March 20

Homework Guidelines:

- Homework is due by 4:30 on the due date specified above. You may turn it in at the beginning of class or place it in my mailbox in the Statistics Building. **No late homeworks will be accepted without permission granted prior to the due date.**

- Use only standard (8.5×11 inch) paper and use only one side of each sheet.

- Homework should show enough detail so that the reader can clearly understand the procedures of the solutions. This is **absolutely essential** for you to receive full credit for your answer since the answers to most of the problems in Rencher appear in the back of the book.

- Problems should appear in the order that they were assigned.

- Some problem numbers differ between the first and second editions of the book. When a problem number is given in parentheses, owners of the second edition should do the problem in parentheses, first edition user's should do the problem not in parentheses. E.g., if I assign problems 1,4, 7(8), 9(11), then first edition user's should do problems 1,4,7,9, and second edition user's should do problems 1,4,8,11.

Assignment:

Read chapters 6–7 of our text and do the following eleven problems:

1. 6.4
2. 6.14 (for this problem, use the birthweight data set described on the next page instead of the Old Faithful data in the book and show all work*)
3. 7.5
4. 7.14
5. 7.17
6. 7.23
7. 7.27 (but note that the problem should read "... to the model cannot decrease the value ...")
8. 7.29
9. 7.33
10. 7.34
11. 7.48 (7.50). But here, change the true model to be $y_i = \beta_0 + \beta_1 x_i + \beta_2 x_i * I(x_i \geq 0) + e_i$, where $I(x_i \geq 0)$ is an indicator variable that equals 1 if $x_1 \geq 0$, 0 otherwise.

---

* You may use Matlab or other suitable software, but attach the code and output with your answers.

Birthweight Data: The data below are the birthweights (y, in grams) and estimated gestational age (x, in weeks) for 12 female babies born in a certain hospital. You may regard these 12 babies as a random sample of all female babies born at the hospital.

Baby ID	Age (weeks)	Weight (g)
1	40	3317
2	36	2729
3	40	2935
4	38	2754
5	42	3210
6	39	2817
7	40	3126
8	37	2539
9	36	2412
10	38	2991
11	39	2875
12	40	3231