**Stats 100C: HW6 due Friday, May 15, 2009 (in class)**

**Page 134-142. Exercises** 4.8, 4.15, 4.16, 4.17 and extra exercise.

**Extra Exercise.** Consider a multiple linear regression $y = X\beta + \epsilon$. Define $\hat{y} = \hat{\mu} = X\hat{\beta}$, $SST = \sum(y_i - \bar{y})^2$, $SSE = S(\hat{\beta}) = \sum(y_i - \hat{y}_i)^2$, and $SSR = SST - SSE$.

a. Show that $SSR = \sum(\hat{y}_i - \bar{y})^2$, that is, $\sum(y_i - \bar{y})^2 = \sum(\hat{y}_i - \bar{y})^2 + \sum(y_i - \hat{y}_i)^2$ still holds.

b. Show that $SSR = \hat{\beta}'X'y - n\bar{y}^2 = \hat{\beta}'X'X\hat{\beta} - n\bar{y}^2$.

**Hint:** You can read the data into R for exercise 4.15 using the following commands

```
dat=read.table("http://www.stat.ucla.edu/~hqxu/stat100C/data/silkw.txt", h=T)
attach(dat)  # so you can use variable Y, X1, X2
par(mfrow=c(1,2))  # to have 2 plots in a row
```

**Note:** Exam 2 is rescheduled on Monday, May 18 in class. It covers Chapters 1-4, HW 1-6. Closed-book, closed-note. Formulas and tables will be provided.