BUS 735: Business Decision Making and Research
Instructor: Dr. James Murray
Homework: Regression Analysis
Due on Wednesday, October 25. Please upload to the appropriate D2L dropbox.

The owner of a moving company needs to estimate how many hours of labor will be required for each upcoming move. Being able to accurately predict this will allow the owner to schedule the right number of employees for each move. If he sends too many employees, he wastes his resources. If he sends too few, his customers are likely to get upset. He collects data from 100 past moves and records the following information:

- **Hours**: How many labor hours the move required

- **Area**: How large the residence was (in square feet)

- **Large**: How many exceptionally large items needed to be carried

- **Bedrooms**: How many bedrooms the residence had

- **Apartment**: Whether or not the residence was an apartment (=1 for apartment, =0 for house).

The data can be downloaded and loaded with the following command:
load(url(''http://murraylax.org/datasets/moving.RData''))

1. Is there evidence that the area of the residence is positively related to how many labor hours are required for each move?

2. Show a scatter plot with a best fit linear regression line illustrating the relationship between labor hours and area of the residence. Does a straight line describe the data well?

3. Estimate a regression equation to explain hours of labor using all other variables in the data set. Write down the estimated equation.

4. Suppose the moving company's next customer has a 3 bedroom house (not an apartment) that is 1800 square feet, and has two large items that need to be moved. Based on your regression equation in #2, what is your prediction for how many labor hours will be required?

5. Based on your regression equation in #2, what percentage of the variability in labor hours is explained by your explanatory variables?

6. Does it matter whether or not the residence is part of an apartment building or not when determining labor hours for moving? Test the appropriate hypothesis, taking into account all the other variables in the data set, and clearly state your conclusion.

7. Based on your regression results from #2, how much additional labor hours is required for each additional bedroom? Report and interpret a 95% confidence interval for this estimate.