Homework 2

Due: Tuesday, Oct. 3rd, by 11:00 am

You are expected to solve all the four problems by yourselves. Discussions within your group are encouraged but you must write out your own answers in your own words. Duplicate homework will not receive credit. Make sure you show all of your work and attach your R-script for full credit. The datasets for the problems can be downloaded from Canvas. ***Please turn in your homework report right before the lecture time.***

1. (4 points) Sec. 3.4, Problem 4 in textbook
2. (5 points) Sec. 3.4, Problem 5 in textbook
3. (2 points) Sec. 3.4, Problem 6 in textbook (page 112: A sample of n=500 data …)
4. (9 points) (**Production time**) In a manufacturing study, the production times for 110 recent production runs were obtained. For each run, the production time (in hours) and the production size were recorded in the file "production_time.txt". *The researcher is interested in predicting the production time from the production size.*

   Part 1

   (a) Develop a simple linear regression model based on least squares that directly predicts Time from Size (that is, do not transform either the predictor nor the response variable). Ensure that you provide justification for your choice of model.

   (b) Describe any weaknesses in your model.

   Part 2

   (a) Develop a simple linear regression model that predicts Time from Size (i.e., feel free to transform either the predictor or the response variable or both variables). Ensure that you provide detailed justification for your choice of model.

   (b) Describe any weaknesses in your model.

   Part 3

   Compare the model in Part 1 with that in Part 2. Decide which provides a better model. Give reasons to justify your choice.