STAT 4/652
Homework 5 SIMPLE LINEAR REGRESSION 1
Due March 2

We use the foot data set introduced in the lecture. The question is if the shoe size is linearly related to the foot length (in cm). **Please use the same names of the variables as I used in class**, that is you will need to change the names in the data set to those I used in class. You have Rscript for this in the RMrkdwn file from the lecture.

Each question is worth 3 points for the total of 39.

TO DO

1. Plot a scatter plot of the data. Does it suggest a linear relationship between the shoe size and foot length?
2. Fit a simple linear regression model to this data.
3. Does the model seem to fit the data?
4. Does foot length seem to increase or decrease with shoe size?
5. What is the average difference in the foot length when shoe size increases by 1 size?
6. What foot length would you expect for someone who wears size 10?
7. Compute fitted values for all observations. What is the fitted value of foot length for someone wearing size 10?
8. Compute residuals for all observations. What is the residual (or residuals) for someone (everyone) wearing size 10? You will have several observations with size 10. Please report the residuals for all of them
9. Estimate σ.
10. Find $\sum e_i$.
11. What is the probability that a person who wears size 10 will have the foot length smaller that 24cm?
12. Find the Pearson correlation coefficient between the shoe size and foot length.
13. Check if the model assumptions are reasonably satisfied for this data. For the report, use only standardized residuals.