**NASCAR Case Study**

Matt Kenseth won the 2012 Daytona 500, the most important race of the NASCAR season. His win was no surprise because for the 2011 season he finished fourth in the point standings with 2330 points, behind Tony Stewart (2403 points), Carl Edwards (2403 points), and Kevin Harvick (2345 points).

In 2011 he earned $6,183,580 by winning three Poles (fastest driver in qualifying), winning three races, finishing in the top five 12 times, and finishing in the top ten 20 times. NASCAR’s point system in 2011 allocated 43 points to the driver who finished first, 42 points to the driver who finished second, and so on down to 1 point for the driver who finished in the 43rd position. In addition, any driver who led a lap received 1 bonus point, the driver who led the most laps received an additional bonus point, and the race winner was awarded 3 bonus points. However, the maximum number of points a driver could earn in any race was 48.

Nascar.csv file includes data for the 2011 season for the top 35 drivers (NASCAR website, February 28, 2011). In addition to the driver name, the following variables are included in the data set.

* Points: points they received
* Poles: how many poles they won
* Wins: how many races they won
* Top5: how many times they were placed in Top 5
* Top10: how many times they were placed in Top 10
* Winnings: winnings they earned in $

You are interested in identifying a regression model that can predict a driver’s winnings.

Part a:

i. Take a peek into the data to better understand your variables and observations.

ii. Produce a scatterplot matrix using the function pairs() to include all of the variables.

iii. Compute the matrix of correlations between the variables using the function cor().

iv. Which variable(s) seem to be good predictors of the winnings?

Part b:

Develop an estimated regression equation that can be used to predict Winnings using the other predictors. Test for model and variable significance as well as multicollinearity, and discuss your findings and conclusions. Think about how you can improve this model.