HW 3

1. This question is adapted from Q 3.3 Refer to Grade Point Average data in Problem 1.19

   a) Prepare a boxplot of the ACT scores (*X* variable). Are there any noteworthy features on the plot?

   b) Prepare a histogram of the residuals. What information does the plot provide?

   c) Plot the residuals against the fitted values $\hat{Y}$. What are your findings about departures from the regression assumptions?

   d) Prepare a normal probability plot of the residuals. Test the reasonableness of the normality assumption with the KS test using α = 0.05. What do you conclude?

   e) Conduct the BP test to determine if the variance varies with the level of *X*. Use α= 0.01. State your conclusion. Does your conclusion support your preliminary findings in part c)?

2. Q 3.10 on p. 149

3. Read the data frame from the file HW3.RData by double-clicking on it and opening with RStudio

   a) Prepare a scatterplot of *X* vs. *Y* overlaid with the estimated regression line.
   b) Calculate the correlation coefficient between *X* and *Y* and comment on the strength of the linear association, using the standard cutoff point of $\pm$0.7
   c) Create a new variable $X' = \sqrt{X}$.
   d) Prepare a scatterplot of X'vs. *Y* overlaid with the estimated regression line.
   e) Calculate the correlation coefficient between X' and *Y* and comment on the strength of the linear association.
   f) Obtain the estimated linear regression function for the transformed data.
   g) Plot the residuals vs. fitted values.
   h) What does the plot from part g) show?