

STAT5103 Assignment 2 (Due date: Friday Oct 5, 11:59pm) [Provide all your R-code]

Data: Car Data

Variables

- X_1 : Price
- X_2 : Mileage (in miles per gallon)
- X_3 : Repair record 1978 (rated on a 5-point scale; 5 best, 1 worst)
- X_4 : Repair record 1977 (scale as before)
- X_5 : Headroom (in inches)
- X_6 : Rear seat clearance (distance from front seat back to rear seat, in inches)
- X_7 : Trunk space (in cubic feet)
- X_8 : Weight (in pound)
- X_9 : Length (in inches)
- X_{10} : Turning diameter (clearance required to make a U-turn, in feet)
- X_{11} : Displacement (in cubic inches)
- X_{12} : Gear ratio for high gear
- X_{13} : Company headquarter (1 for USA, 2 for Japan, 3 for Europe)

Use variables $X_1, X_2, X_5, \dots, X_{12}$ for this exercise.

1. Plot the correlation chart.
2. Based on your correlation chart, summarize your findings.
3. Conduct a regression analysis using X_1 as the dependent variable and the others as independent variables.
 - a. State the model.
 - b. What is the regression equation?
 - c. Test the overall utility of the model with $\alpha = 0.05$.
 - d. Give the parameter table and based on the p -values, which independent variables are useful for the prediction of the price of the car?
 - e. What is the adjusted R square? Comment.
4. Use stepwise regression (the method discussed in class) for variable selection. For your final model,
 - a. What is the AIC value?
 - b. State the model.
 - c. What is the regression equation?
 - d. Test the overall utility of the model with $\alpha = 0.05$.
 - e. Give the parameter table and based on the p -values, which independent variables are useful for the prediction of the price of the car?
 - f. What is the adjusted R square? Comment.