1. a.) 3 examples of problems that could be modeled with a linear model include:
   * 1. Modeling the relationship between total miles driven in a car and total amount of money paid for gas in order to predict how much money to allocate towards gas for a cross-country road trip.
     2. Modeling the relationship between a computer’s functionality over time and what is the amount of time before an individual should buy a new computer.
     3. Modeling the tensile strength of plastic (Mech E)
2. Chart, line chart

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* 1. Qualitatively, I would select model 4 - estimating MPG using weight. This is because visually, this model seems to have the least variance. Meaning, that the data points seem to be the least spread out from the linear regression model when MPG is plotted against Weight in comparison to when it is plotted against Cylinders, Displacement, Horsepower, or Acceleration. To me, this indicates that the model of linear regression is one of the best fits for the data set and that MPG is best estimated using weight if we are estimating MPG using a single variable.
     1. MPG vs. Cylinders: R^2 = 0.60341
     2. MPG vs. Displacement: R^2 = 0.64690
     3. MPG vs. Horsepower: R^2 = 0.60479
     4. MPG vs. Weight: R^2 = 0.69145
     5. MPG vs. Acceleration: R^2 = 0.17724
  2. Quantitatively, I would also select model 4 – estimating MPG using weight if we are estimating MPG using a single variable. This is because it has the highest R^2 value of the models considered and the R^2 value represents a measure of fit for how much variation of a dependent variable is explained by the independent variable in the regression model. As R^2 increases, more variation is accounted for, so I would choose the model with the highest R^2 value (MPG vs. Weight).
  3. In my case, the qualitative and quantitative analysis of model quality were equal. Generally, however, qualitative analysis of model quality is visual - based on one’s visual interpretation of how well a linear regression model fits the data set. Meanwhile, quantitative analysis of model quality is based on the R^2 value and which model has the highest R^2 value that accounts for the most variation in data from the linear regression model.
  4. Code is submitted along with document
  5. Diagram

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