The multiple regression equation for miles per gallon (mpg) as the response variable with weight (wt) and horsepower (hp) as predictor variables can be represented as:

mpg = 37.5353 - 4.0024 \* wt - 0.0308 \* hp

The car rental company can use this model to predict a car's fuel efficiency (miles per gallon) based on its weight and horsepower. By inputting the weight and horsepower of a vehicle into this equation, the company can estimate its miles per gallon, which can help the company make informed decisions about the types of cars to purchase or rent out to customers.

The coefficients of correlation between miles per gallon and horsepower are -0.775170, and between miles per gallon and the car's weight are -0.877516. Both coefficients are negative, indicating a strong negative correlation between miles per gallon and weight and horsepower. This suggests that as weight and horsepower increase, miles per gallon decrease. The coefficients of correlation indicate a strong correlation between these variables.

Table

Description automatically generated

mpg wt hp

mpg 1.000000 -0.877516 -0.775170

wt -0.877516 1.000000 0.668304

hp -0.775170 0.668304 1.000000

Chart, scatter chart

Description automatically generated

Chart, scatter chart

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Table

Description automatically generated

Responses:

1. To find the predicted value of miles per gallon for a car that has 2,780 lbs. weight and 225 horsepower, we can use the multiple regression equation provided: mpg = 37.5353 - 4.0024 \* wt. - 0.0308 \* hp. Plugging in the values: mpg = 37.5353 - 4.0024 \* 2.78 - 0.0308 \* 225 = 14.805. So the predicted value of miles per gallon for this car is 14.805. The residual can be calculated by subtracting the actual value (18) from the predicted value (14.805), resulting in a residual of 3.195.
2. The plots and correlation coefficients provided by my peer show a similar pattern to the ones I provided, with both showing a negative correlation between miles per gallon and weight and horsepower. The correlation coefficients are also in the same range, with the coefficients of correlation provided by my peer slightly higher than mine.
3. I would recommend this regression model to the car rental company as a useful tool to predict fuel efficiency of cars based on their weight and horsepower. The negative correlation between miles per gallon and weight and horsepower, as well as the strong correlation coefficients, suggest that the model will provide accurate predictions and can help the company make informed decisions about which cars to purchase or rent out.

Response 2:   
  
The predicted value of miles per gallon for a car that has 2.78 (2,780 lbs.) weight and 225 horsepower can be calculated using your peer's multiple regression model: mpg = 37.0109 - (-3.8893 \* 2780) - (0.0301 \* 225) = 16.99 So, the predicted value of mpg for this car is 16.99. The residual can be calculated as: residual = actual value - predicted value = 18 - 16.99 = 1.01

Your answers' plots and correlation coefficients are similar in that they both show a negative trend between mpg and the predictor variables, weight and horsepower. In addition, the correlation coefficients between mpg and weight and horsepower are both negative, indicating a strong negative correlation between these variables. However, the values of the correlation coefficients and the coefficients in the multiple regression equation are slightly different between your information and your peer's information.

Yes, I would recommend this regression model to the car rental company as it provides valuable insights into the relationship between mpg, weight, and horsepower. The data support the negative correlation between mpg and weight and horsepower, and the multiple regression equation provides a way to predict mpg based on weight and horsepower. However, it's essential to keep in mind that this is just a model, and there could be other factors that affect mpg that are not accounted for in the model.