Regression Homework.

This homework is based on the CarPrice\_Assignment file. The data dictionary is in the car price prediction zip folder as well. The dependent variable (your target variable) is Price. Alpha is equal to 0.05.

These are the continuous random variables I have identified for you.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| compressionratio | horsepower | peakrpm | citympg | highwaympg |

1. Create a table of correlations with the variables listed above and the dependent variable. Copy/paste the table and the script here.

cor(CarPrice[c(-(0:20))])

Text

Description automatically generated

1. Write the order of the correlations relative to the dependent variable.

Price 0.06798351 0.8081388 -0.08526715 -0.6857513 -0.69759909 1.00000000

1. Build a simple linear regression. Explain what the p value next to the F-Statistic implies

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F-statistic: 382.2 on 1 and 203 DF, p-value: < 2.2e-16

1. Go through the procedures described to you in class via the forward model building procedures and create a multiple linear regression with the 5 continuous random variables (not all continuous variables will necessarily make it to the final model you come up, remember how to use the adjusted r^2 and the p values next to the independent variables). Copy/paste the summary output here.

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 9356.4666 4565.1700 2.050 0.0417 \*

horsepower 142.5502 12.3189 11.572 < 2e-16 \*\*\*

compressionratio 448.2951 86.2209 5.199 4.94e-07 \*\*\*

peakrpm -1.3809 0.6824 -2.024 0.0444 \*

citympg 200.5006 208.5854 0.961 0.3376

highwaympg -437.3117 182.7394 -2.393 0.0176 \*

1. Add to the model you identified in 4, carbody feature. Interpret the p value of wagon.

Like in question 3, the p value of wagon does not influence price because

1. What percentage of the variation in Price are you able to explain with the model you have used in (5)
2. Build a regression model using Carbody, Horsepower,CityMPG and Highway MPG. Predict the Price of a car that is : CarBody: Convertible, Horsepower:111,CityMPG:21,HighwayMPG:27.
3. This corresponds to the car description in row number 1. What is the residual for the car? Compute it via Y-E(Y)
4. Look at the summary output of your regression object. Interpret the p value of the global hypothesis test (p value next to the F-Statistic). Interpret the coefficient of wagon.