

Lab10

2024-11-11

Q1

Use SAS to run the multiple linear regression model for cityCO2 with Engine, Cylinder, and CityMPG as explanatory variables. Use the output to complete the following exercises.

(a)

Give the equation for predicting the cityCO2 values from the three explanatory variables

(b)

Conduct an F-test for the overall model in helping to explain the cityCO2 values. Report the null and alternative hypotheses, test statistic and p-value, and interpret the result in the context of the study.

(c)

Give the value of R^2 for this model and interpret its value (in context).

(d)

Conduct a t-test for the significance of Engine in the model that includes Cylinder and CityMPG. Report the null and alternative hypotheses, test statistic and p-value, and interpret the result in the context of the study.

Q2

Use SAS to run the multiple linear regression model for cityCO2 with Engine, Cylinder, CityMPG, and Gears as explanatory variables. Use the output to complete the following exercises.

(a)

How much does adding Gears to the multiple linear regression model with Engine, Cylinder, and CityMPG reduce the sums of squared errors?

(b)

How much does adding Gears to the multiple linear regression model with Engine, Cylinder, and CityMPG increase the value of R^2 ?

(c)

Conduct an F-test for the effect of adding Gears to the multiple linear regression model with Engine, Cylinder, and CityMPG. Report the null and alternative hypotheses, test statistic and p-value, and interpret the result in the context of the study.

Q3

Use SAS to run the multiple linear regression model for cityCO2 with Engine, Cylinder, CityMPG, Gears, and Intake as explanatory variables. Use the output to complete the following exercises.

(a)

Give the equation for predicting the cityCO2 values from the four explanatory variables for vehicles with two intake valves per cylinder and for vehicles that do not have two intake valves per cylinder. What is the difference in these two equations?

(b)

Conduct a t-test for the significance of Intake in the model that includes Engine, Cylinder, CityMPG, and Gears. Report the null and alternative hypotheses, test statistic and p-value, and interpret the result in the context of the study

Q4

How do the 3 MLR models compare?