HW1

BR

24/01/2020

(a)What is the effect of adding an additional room on the house price, holding NOxconcentrations and student-teacher ratio constant?

An extra room will increase the house price by $6419.07

(b)What is the estimated effect on house values of reducing NOx concentrations by 2.5 partsper 100 million?

Reducing the NOx concentrations by 2.5 parts per 100 million will increase the value of the house by $3827.06

(c)What percent of the variation in house values is explained by NOx concentrations, number ofrooms, and student-teacher ratio?

57.0830728 %

1. What is the predicted value of a house with NOx concentrations of 6, with 7 rooms, and astudent-teacher ratio of 20? The actual price for that house was $20,000. Did the buyer overpayfor this house?

* The predicted value of the house is $2.443328910^{4}. The buyer got a great deal on the house!

(e)Test the null hypothesis that β1 zero.

e<-linearHypothesis(price\_rlm,c("nox=0"), white.adjust = "hc2")  
  
e$Chisq

## [1] NA 47.82278

e$`Pr(>Chisq)`

## [1] NA 4.665387e-12

(f)Test the null hypothesis that β1 and β3 jointly equal zero.

(g)Test the null hypothesis that β1 = β3.

1. Rejecy Null. test-statistic is -6.915. We can reject the null hypothesis at the 5% interval that the coefficient is not zero.
2. Reject null. They are no jointly 0.

F-statistic for this joint hypothesis test is about 295.09 and the corresponding p-value is < 2.2e-16. Thus, we can reject the null hypothesis that both coefficients are zero

1. Can’t reject the null hypothesis.

F-statistic for this joint hypothesis test is about 1.5561 and the corresponding p-value is 0.2122. Thus, we cannot reject the null hypothesis that both coefficients are equal.