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Hypothesis Testing for Multiple Regression

The hypotheses for multiple regression are similar to those for simple linear regression. The null hypothesis is that the multiple regression model does not fit the data better than the baseline model (a horizontal regression surface with no tilt in space). In other words, all the slope parameters are equal to 0. Therefore, the predictor variables do not explain a significant amount of variability in the response variable.

The alternative hypothesis is that the regression model fits the data better than the baseline model. It indicates that at least one of the slope parameters is not equal to 0. At least one predictor variable explains a significant amount of variability in the response variable.

In order for a multiple regression analysis to be valid, four assumptions must be met. The response, Y, is accurately modeled by a linear function of the Xs. The random error term, ε, has a normal distribution with a mean of zero. ε has a constant variance, σ^2, also known as homoscedasticity. The errors are independent. For now, keep these assumptions in mind.

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