Multiple Linear Regression Model

The multiple linear regression model is a GLM that models the response variable, Y, as a linear function of the *k* continuous predictor variables, the Xs. The model has $p = k + 1$ parameters (the βs) because it includes the intercept (β_0). When you fit a model to your data, you do hypothesis testing to determine whether the estimated model fits the data better than a baseline model.

A baseline model is a model that has a slope of zero; in other words, all of the slope parameters equal zero. The null hypothesis is that the estimated regression model does not fit the data better than the baseline model. If you fail to reject this hypothesis, you do not have enough evidence to say that at least one slope in the estimated model is not zero. Therefore, you do not have enough evidence to say that the predictor variables explain a significant amount of variability in the response variable.

The alternative hypothesis is that the regression model does fit the data better than the baseline model. If the alternative hypothesis is true, you reject the null hypothesis. In this case, you do have enough evidence to say that the slopes are not all equal to zero and that one or more predictor variables explain a significant amount of variability in the response variable. For additional details about the multiple regression model, click the Information button.

Close