

MATH221, Week 7

Linear Regression versus Multiple Regression

Linear Regression

Linear regression uses one explanatory variable to predict, approximate, or explain one response variable. The equation of a linear regression line is $\hat{y} = mx + b$

Multiple Regression

Multiple regression uses two or more explanatory variables to predict, approximate or explain one response variable. A multiple regression equation looks like this:

$$\hat{y} = b + m_1x_1 + m_2x_2 + m_3x_3 + \cdots + m_ix_i$$

Comparison

Many times the multiple regression equation will produce more accurate predictions or estimates for the response variable because it takes into account more variables that have some part in explaining the behavior of the response variable. Linear regression equations take into account only one explanatory variable and that variable may prove to play a much smaller role in explaining the behavior of the response variable than other variables involved.