

MATH221, Week 7

Using a multiple regression equation to estimate values from independent variable values

Introduction

One estimates the values of the dependent or response variable using a multiple regression equation by substituting the given value for each explanatory or independent variable into the equation and simplifying the resulting expression.

Example

The volume of a black cherry tree can be modeled by the equation $\hat{y} = -52.2 + 0.3x_1 + 4.5x_2$

Where x_1 is the tree's height (in feet) and x_2 is the tree's diameter (in inches).

Find the volume of the tree where $x_1 = 70$ and $x_2 = 8.6$

Replace x_1 with 70 and x_2 with 8.6 in the given equation to get $\hat{y} = -52.2 + 0.3(70) + 4.5(8.6)$

Do the multiplications and then add to get $\hat{y} = -52.2 + 21 + 38.7 = 7.5 \text{ ft}^3$

Hint: When evaluating regression equations for given independent variable(s) look closely at the first term in case there is a leading negative sign. They can be hard to spot as they sometimes blend in with the equal sign.

For Example: $y = -2.3x + 5$.

Note that in this equation there is a negative sign in front of the 2.3!