

Chapter 12

Simple Linear Regression

Learning Objectives

1. Understand how regression analysis can be used to develop an equation that estimates mathematically how two variables are related.
2. Understand the differences between the regression model, the regression equation, and the estimated regression equation.
3. Know how to fit an estimated regression equation to a set of sample data based upon the least-squares method.
4. Be able to determine how good a fit is provided by the estimated regression equation and compute the sample correlation coefficient from the regression analysis output.
5. Understand the assumptions necessary for statistical inference and be able to test for a significant relationship.
6. Know how to develop confidence interval estimates of y given a specific value of x in both the case of a mean value of y and an individual value of y .
7. Learn how to use a residual plot to make a judgement as to the validity of the regression assumptions.
8. Know the definition of the following terms:
 - independent and dependent variable
 - simple linear regression
 - regression model
 - regression equation and estimated regression equation
 - scatter diagram
 - coefficient of determination
 - standard error of the estimate
 - confidence interval
 - prediction interval
 - residual plot