CHAPTER 14: Simple Linear Regression

Learning Objectives

After reading this chapter and doing the exercises, you should be able to:

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, recognize outliers, and identify influential observations.
8. Know how the Durbin-Watson test can be used to test for autocorrelation.
9. 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

standardized residual plot

outlier

influential observation

leverage