1. **Price and Weight of Bicycles.** *Bicycling World*, a magazine devoted to cycling, reviews hundreds of bicycles throughout the year. Its Road-Race category contains reviews of bicycles used by riders primarily interested in racing. One of the most important factors in selecting a bicycle for racing is its weight. The following data show the weight (pounds) and price ($) for 10 racing bicycles reviewed by the magazine. **LO 1, 3, 4, 5**

Model	Weight (lb)	Price ($)
Fierro 7B	17.9	2,200
HX 5000	16.2	6,350
Durbin Ultralight	15.0	8,470
Schmidt	16.0	6,300
WSilton Advanced	17.3	4,100
bicyclette vélo	13.2	8,700
Supremo Team	16.3	6,100
XTC Racer	17.2	2,680
D'Onofrio Pro	17.7	3,500
Americana #6	14.2	8,100

   a. Develop a scatter chart with weight as the independent variable. What does the scatter chart indicate about the relationship between the weight and price of these bicycles?
   b. Use the data to develop an estimated linear regression equation that could be used to estimate the price for a bicycle, given its weight. What is the estimated linear regression model?

2. **Production Rate and Quality Control.** In a manufacturing process the assembly line speed (feet per minute) was thought to affect the number of defective parts found during the inspection process. To test this theory, managers devised a situation in which the same batch of parts was inspected visually at a variety of line speeds. They collected the following data. **LO 1, 3, 4, 5**

DATA*file*
linespeed

Line Speed (ft/min)	No. of Defective Parts Found
20	21
20	19
40	15
30	16
60	14
40	17

   a. Develop a scatter chart with line speed as the independent variable. What does the scatter chart indicate about the relationship between line speed and the number of defective parts found?
   b. Use the data to develop an estimated linear regression equation that could be used to predict the number of defective parts found, given the line speed. What is the estimated linear regression model?

DATA*file*
jensens

3. **Machine Maintenance.** Jensen's Tire & Auto is deciding whether to purchase a maintenance contract for its recently installed computer wheel alignment and balancing machines. Managers feel that maintenance expense should be related to usage, and they collect information on weekly usage (hours) and annual maintenance expense (in hundreds of dollars) from 300 Jensen's Tire & Auto locations throughout the nation. These data are available in the file *jensens*. **LO 1, 3, 4, 5, 9**
   a. Develop a scatter chart with weekly usage hours as the independent variable. What does the scatter chart indicate about the relationship between weekly usage and annual maintenance expense?
   b. Use the data to develop an estimated linear regression equation that could be used to predict the annual maintenance expense for a given number of hours of weekly usage. What is the estimated linear regression model?