1. Real estate investors, homebuyers, and homeowners often use the appraised (or market) value of a property as a basis for predicting sale price. Data on sale prices and total appraised values of 76 residential properties sold in 2008 in an upscale Tampa, Florida, neighborhood named Tampa Palms are saved in the TAMPALMS file.

(a) Propose a straight-line model to relate the appraised property value x to the sale price y for residential properties in this neighborhood.
(b) Interpret the y-intercept of the least squares line. Does it have a practical meaning for this application? Explain.
(c) Interpret the slope of the least squares line. Over what range of x is the interpretation meaningful?
(d) Use the least squares model to estimate the mean sale price of a property appraised at $300,000.
(e) Compute an estimate of σ.

2. Data on structurally deficient highway bridges is compiled by the Federal Highway Administration (FHWA) and reported in the National Bridge Inventory (NBI). For each state, the NBI lists the number of structurally deficient bridges and the total area (thousands of square feet) of the deficient bridges. The data for the 50 states (plus the District of Columbia and Puerto Rico) are saved in the FHWABRIDGE file. For future planning and budgeting, the FHWA wants to estimate the total area of structurally deficient bridges in a state based on the number of deficient bridges.

a. Fit the least squares prediction equation.
b. Plot the data and graph the least squares line as a check on your calculations.
c. List the assumptions required for the regression analysis.
d. Locate the estimated standard error of the regression model, s, on the printout.
e. Use the value of s to find a range where most (about 95%) of the errors of prediction will fall.

3. Refer to the data on sale prices and total appraised values of 76 residential properties in an upscale Tampa, Florida, neighborhood.

a. Use the output to determine whether there is a positive linear relationship between appraised property value x and sale price y for residential properties sold in this neighborhood. That is, determine if there is sufficient evidence (at α = .01) to indicate that β 1, the slope of the straight-line model, is positive.
b. Find a 95% confidence interval for the slope, β 1, on the printout. Interpret the result practically.
c. What can be done to obtain a narrower confidence interval in part b?