**Problem 1**:

(a) How does correlation analysis differ from regression analysis? (b) What does a correlation

coefficient reveal? (c) State the quick rule for a significant correlation and explain its

limitations. (d) What sums are needed to calculate a correlation coefficient? (e) What

are the two ways of testing a correlation coefficient for significance?

**Problem 2**:

In the following regression, X = weekly pay, Y = income tax withheld, and n = 35 McDonald’s

employees. (a) Write the fitted regression equation. (b) State the degrees of freedom

for a two- tailed test for zero slope, and use Appendix D to find the critical value at α

= .05. (c) What is your conclusion about the slope? (d) Interpret the 95 percent

confidence limits for the slope. (e) Verify that F = t2 for the slope. (f) In your own

words, describe the fit of this regression.



**Problem 3**:

In the following regression, X = total assets ($ billions), Y = total revenue ($

billions), and n = 64 large banks. (a) Write the fitted regression equation. (b)

State the degrees of freedom for a two-tailed test for zero slope, and use

Appendix D to find the critical value at α = .05. (c) What is your conclusion about

the slope? (d) Interpret the 95 percent confidence limits for the slope. (e) Verify

that F = t2 for the slope. (f) In your own words, describe the fit of this regression.



**Problem 4**:

A researcher used stepwise regression to create regression models to predict

BirthRate (births per 1,000) using five predictors: LifeExp (life expectancy in

years), InfMort (infant mortality rate), Density (population density per square

kilometer), GDPCap (Gross Domestic Product per capita), and Literate (literacy

percent). Interpret these results.



**Problem 5**:

An expert witness in a case of alleged racial discrimination in a state university

school of nursing introduced a regression of the determinants of Salary of each

professor for each year during an 8-year period (n = 423) with the following

results, with dependent variable Year (year in which the salary was observed)

and predictors YearHire (year when the individual was hired), Race (1 if

individual is black, 0 otherwise), and Rank (1 if individual is an assistant

professor, 0 otherwise). Interpret these results.



**Problem 6**:

(a) Plot the data on U.S. general aviation shipments. (b) Describe the pattern and

discuss possible causes. (c) Would a fitted trend be helpful? Explain. (d) Make a

similar graph for 1992–2003 only. Would a fitted trend be helpful in making a

prediction for 2004? (e) Fit a trend model of your choice to the 1992–2003 data.

(f) Make a forecast for 2004, using either the fitted trend model or a judgment

forecast. Why is it best to ignore earlier years in this data set?

