Chapter 3 Regression Practice Name:

1. What is the relationship between the price charged for a hot dog and the price charged for a regular size soda in major league baseball stadiums? Here are some data:

| Team | Hot Dog | Soda | Team | Hot Dog | Soda | Team | Hot Dog | Soda |
|---|---|---|---|---|---|---|---|---|
| Angels | 3.50 | 2.75 | Giants | 2.75 | 2.17 | Rangers | 2.00 | 2.00 |
| Astros | 2.00 | 2.00 | Guardians | 2.00 | 2.00 | Red Sox | 2.25 | 2.29 |
| Braves | 2.50 | 2.25 | Marlins | 2.25 | 1.80 | Rockies | 2.25 | 2.25 |
| Brewers | 2.00 | 2.00 | Mets | 2.50 | 2.50 | Royals | 1.75 | 1.99 |
| Cardinals | 3.50 | 3.00 | Padres | 1.75 | 2.25 | Tigers | 2.00 | 2.00 |
| Dodgers | 3.50 | 2.75 | Phillies | 2.75 | 2.20 | Twins | 2.50 | 2.22 |
| Expos | 1.75 | 2.00 | Pirates | 1.75 | 1.75 | White Sox | 2.00 | 2.00 |

a. Make a scatterplot appropriate for predicting soda price from hot dog price. Describe the relationship.

b. Find the correlation between hot dog price and soda price. Explain this value.

c. Find the coefficient of determination ( $r^2$ ). Interpret this value.

d. Find the equation of the least-squares regression line for predicting soda price from hot dog price.

e. Explain carefully the intercept of the LSRL in the context of this problem.

f. Discuss how well the LSRL fits the data.

2. It is usual in finance to describe the returns from investing in a single stock by regressing the stock's return from the stock market as a whole. This helps us see how closely the stock follows the market. We examine the total monthly percent return on Facebook stock, *y,* and the monthly percent return on the S & P, *x,* (which represents the market), for the period between July 1990 and May 1997. Here are the results:

$\bar{x} = 1.304$ $s_x = 3.392$ $\bar{y} = 1.878$ $s_y = 7.554$ $r = 0.5251$

A scatterplot shows no very influential observations.

a. Find the equation for the LSRL.

b. Explain carefully what the slope of the line tells us about how Facebook stock responds to changes in the market.

c. Predict the percent monthly return for Facebook if the S&P monthly percent return was 2.1.