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Elementary Statistics: Solution to Homework 10

Solution

Page 821 Problem 13.1:

a) The estimated mean sale price is -30,000+7000(30) = 180,000 dollars.

b) Since 5000 square feet is outside the range of the data (1500 square feet to 3500 square feet) used to find the regression line, the result might not be accurate.
I will not use the resulting least squares equation to predict the mean sale price.

Page 821 Problem 13.2:

1.9 by the interpretation of the slope.

Page 858 Problem 13.13:

c) $r = -0.77$.

Page 858 Problem 13.15:

The answer is c) as one variable increase, the other variable tends to decrease.

Page 858 Problem 13.18:

a) The answer is iv).
b) The answer is iii) since both variables x and y need to be quantitative variables (numbers).

Last problem in the homework sheet:

In this problem, x is the size of a diamond (carats) and y is the prices. (x is a cause and y is an effect).

a) We first find the slope b by using the formula $b = r\frac{s_y}{s_y}$.

$b = 0.9917(1947.0588)/0.1597 = 12090.7841$.

Then we find the y-intercept a by using the formula $a = \bar{y} - b\bar{x}$.

$a = 4946.5556 - 12090.7841(0.82) = -4967.8874$.

Therefore the least squares regression line is

$\hat{y} = 12090.7841x - 4967.8874.$

b) The estimated price of a diamond that weight 0.72 carats is $12090.7841(0.72) - 4967.8874 = 3737.4772$.

c) As the size of the diamond increases by 1 carat, the price increases by 12090.7841 dollars.

d) $e = y - \hat{y} = 6426 - (12090.7841(0.91) - 4967.8874) = 391.2739$ dollars.