

Pledge:

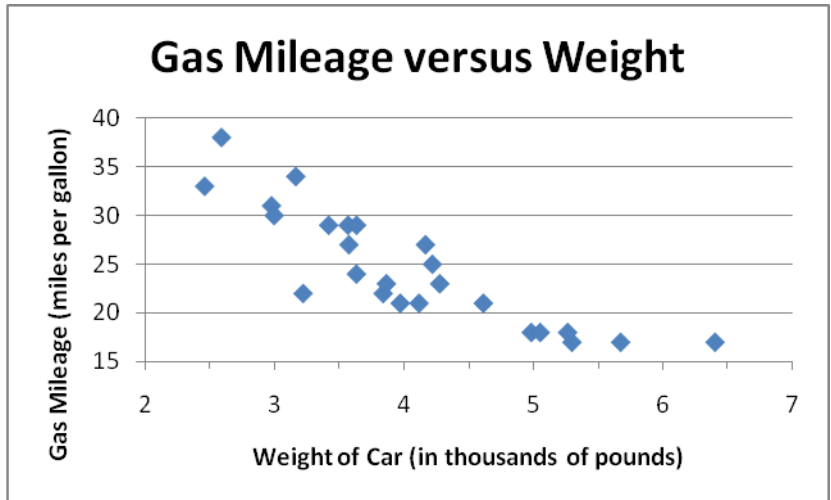
2/20/2008
Dr. Lunsford

MATH 171
Quiz 2

Name: _____
100 Points Possible

Problem I. Below you are given a scatterplot of twenty five 2004 model cars showing the weight of the car (in thousands of pounds) and the miles per gallon for the car (mpg). The average weight of the 25 cars is 4,037.8 pounds and the average mpg for the cars is 24.6. The correlation coefficient for the two variables weight and mpg is 0.8666. Please answer the following questions: (55 points total)

(a) Describe the relationship between the two variables weight and mpg (form, direction, strength). (9 points)



(b) The equation of the regression line is given by

$$\hat{y} = 45.645 - 5.222x$$
 where y is

mpg and x is weight (in thousands of pounds). Accurately graph the regression line on the graph above. Note that the vertical axis is located at $x = 2$. (10 points)

(c) For each increase in weight of cars by 1000 pounds, what does the regression model given in part (b) predict? (10 points)

(d) What percent of the variation in mpg is explained by the linear regression model given in part (b)? (6 points)

(e) The Mercedes Benz SLR was one of the twenty five models in the data set. It weighs 3,220 pounds and gets 22 mpg. Clearly indicate on scatterplot above which point corresponds to the Mercedes Benz SLR. (7 points)

(f) What mpg does the regression model given in part (b) predict for the Mercedes Benz SLR described in part (e)? (7 points)

(g) Find the residual for the data point associated with the Mercedes Benz SLR. (6 points)

Problem II. Because elderly people may have difficulty standing to have their heights measured, a study looked at predicting overall height from height to the knee. Below are the data (in centimeters) for five elderly men: (10 points each, 30 points total)

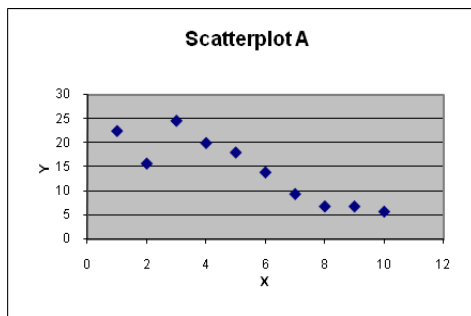
Knee Height (x)	57.7	47.4	43.5	44.8	55.2
Height (y)	192.1	153.3	146.4	162.7	169.1

(a) Find the correlation between knee height and overall height. Please show all calculator commands (with input) that you use. Clearly indicate your answer.

(b) Find the equation of the least-squares regression line for predicting height from knee height. Please show all calculator commands (with input) that you use. Clearly indicate the equation of the line.

(c) Use the line found in part (b) to predict the height of an elderly man whose knee height is 50.2 centimeters. Please explicitly show how you are using the regression line equation.

Problem II. Below you are given three scatterplots and three correlation coefficients. Please write the name of the scatterplot (i.e. either A, B, or C) in the blank next to the correlation coefficient for the scatterplot. (5 points each – 15 points total)



$$r = -0.99 \underline{\hspace{2cm}}$$

$$r = -0.81 \underline{\hspace{2cm}}$$

$$r = -0.89 \underline{\hspace{2cm}}$$

