Classroom Voting Questions: Elementary Statistics

Cautions about Correlation and Regression

1. Gas mileage and weight were recorded for each automobile in a sample of 20 compact cars. There was a strong negative correlation, with r = -.87. Based on the value of r, it is reasonable to conclude that increasing the weight of a compact car causes a decrease in gas mileage.

   (a) True, and I am very confident.

   (b) True, and I am not very confident.

   (c) False, and I am not very confident.

   (d) False, and I am very confident.

2. Which of the following characteristics in a residual plot are indicative of potential problems?

   (a) A strong pattern in the residual plot

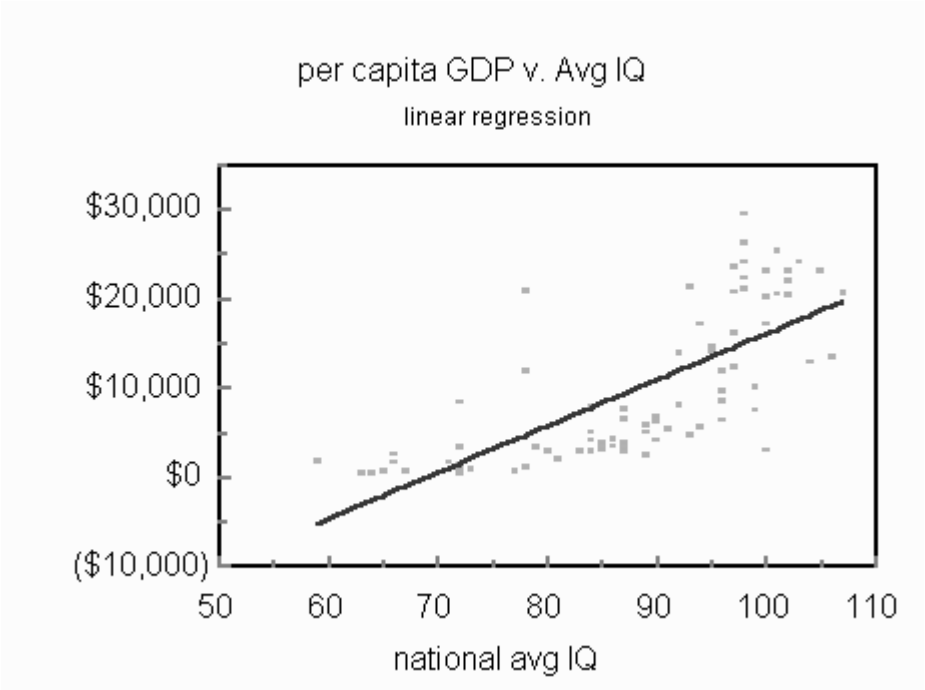
   (b) Isolated points in the residual plot

   (c) A lack of any strong pattern in the residual plot

   (d) Both (a) and (b) above are indicative of potential problems

   (e) (a), (b), and (c) above are all indicative of potential problems

3. Which phrase best describes the scatterplot?



(a) strong $+r$

(b) strong $-r$

(c) weak $+r$

(d) weak $-r$

(e) influential outliers

(f) non-linearity

(g) Two from (A)-(F) are true.

(h) Three from (A)-(F) are true.

4. Why is it important to look for outliers in data prior to applying regression?

   (a) Outliers always affect the magnitude of the regression slope.

   (b) Outliers are always bad data.

   (c) Outliers should always be eliminated from the data set.

   (d) Outliers should always be considered because of their potential influence.

   (e) We shouldn't look for outliers, because all the data must be analyzed.

5. Which of the following factors is *NOT important* to consider when interpreting a correlation coefficient?

   (a) restriction of range

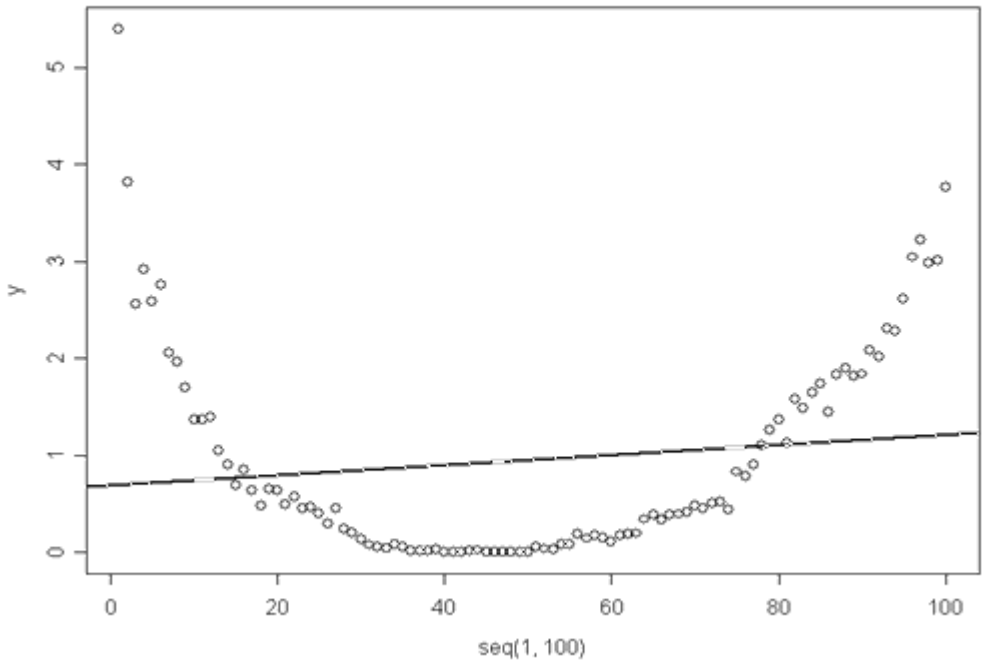
(b) problems associated with aggregated data

(c) outliers

(d) lurking variables

(e) unit of measurement

6. What is the greatest concern about the regression below?



(a) It has a small slope.

(b) It has a high R^2.

(c) The investigator should not be using a linear regression on these data.

(d) The residuals are too large.

(e) The regression line does not pass through the origin.