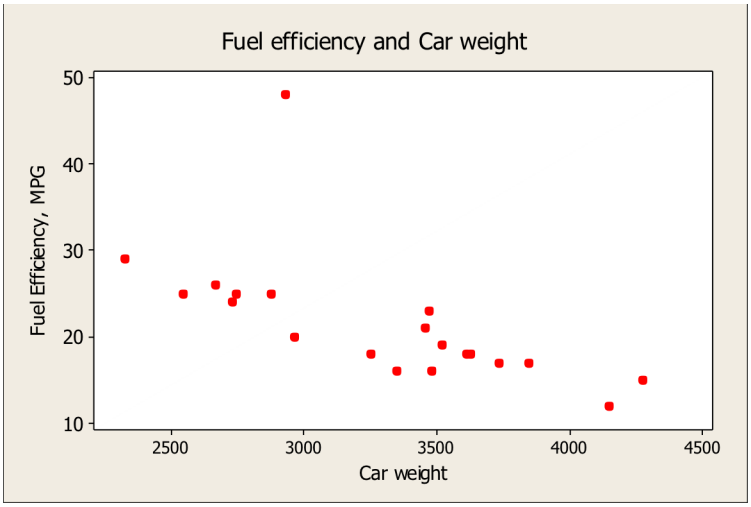
1. The scatterplot below shows the fuel efficiency (in miles per gallon) and weight (in pounds) of twenty subcompact cars.



(a) Is there a clear explanatory variable and response variable in this setting? If so, tell which is which. If not, explain why not.

(b) Does the scatterplot show a positive association, negative association, or neither? Explain why this makes sense.

(c) How would you describe the *form* of the relationship?

(d) Which of the following is closest to the correlation between car weight and fuel efficiency for these 20 vehicles? Explain.

$r = -0.9$ $r = -0.6$ $r = 0$ $r = 0.4$

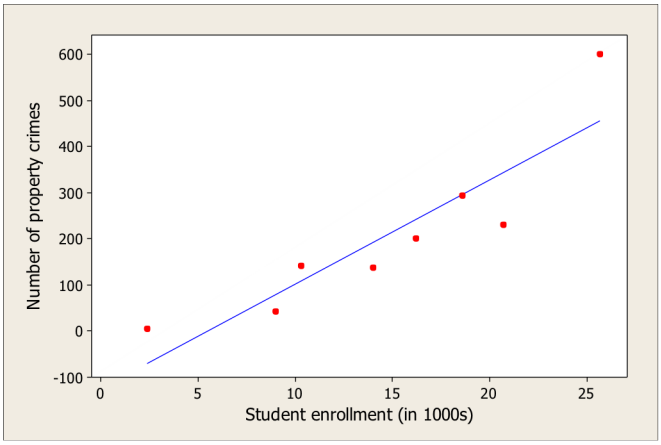
(e) There is one "unusual point" on the graph. Explain what is "unusual" about this car.

(f) What effect would removing the "unusual point" have on the correlation? Justify your answer.

(g) If we converted the car weights to metric tons (1 metric ton ≈ 2,205 pounds). How would the correlation change? Explain.

2. The table and scatterplot below show the relationship between student enrollment (in thousands) and total number of property crimes (burglary and theft) in one year for eight colleges and universities in a certain U.S. state.

Enrollment (in 1000s) (x)	No. of Property Crimes (y)
16	201
2	6
9	42
10	141
14	138
26	601
21	230
19	294



The equation of the least-squares regression line is $\hat{y} = -112.58 + 21.83x$, where $\hat{y}$ = predicted number of property crimes and x = student enrollment in thousands.

(a) Interpret the slope of the least-squares line in the context of the problem.

(b) How many crimes would you predict on a campus with enrollment of 14 thousand students? Show your work.

(c) Find the residual for the campus with 14 thousand students and 138 property crimes. Show your work. Interpret the value of the residual in the context of the problem.

(d) Use the scatterplot to make a rough sketch of the residual plot for these data. (No calculations are necessary).

(e) Would the slope of the regression line change if the point (26, 601) were removed from the data set? If so, in what direction?

(f) The value of r^2 for these data is 0.801, and the value of s is 89.2. Interpret these values in the context of the problem.

(g) Is the given least-squares regression line a good model for these data? Support your answer with appropriate evidence from your answers above.