Crime & Coffee #2

Task adopted from www.illustrativemathmatics.org aligned with standard S-ID.B6

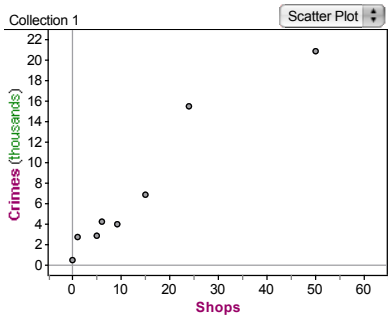
Written task aligned with LR: Loop 3

Many counties in the United States are governed by a county council. At public county council meetings, county residents are usually allowed to bring up issues of concern. At a recent public County Council meeting, one resident expressed concern that three new coffee shops from a popular coffee shop chain were planning to open in the county, and the resident believed that this would create an increase in property crimes in the county. (Property crimes include burglary, larceny-theft, motor vehicle theft, and arson -- From *http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2010/crime-in-the-u.s.-2010/property-crime accessed on December 5, 2012*.)

To support this claim, the resident presented the following data:

County	Shops	Crimes
A	9	4000
B	1	2700
C	0	500
D	6	4200
E	15	6800
F	50	20800
G	5	2800
H	24	15400

In order to have a better visual dipiction of the data, here is a scatterplot:



1.Find the sample linear regression line using technology. Write the equation here.

2. a) By looking at the scatterplot, make an estimate of the value of the correlation coefficient. Explain your estimate.

b) Based on the regression line, think about what a residual plot would look like. You can sketch one or plot one using technology, if it helps you visualize. What is the relationship between the correlation and the residuals?

3. a) Compute the correlation coefficient using technology. Is it close to your prediction in #2(a)? Explain.

b) What does the correlation coefficient signify? Can you describe the meaning of the correlation coefficient in the context of the problem?

4. Is the following statement accurate? Explain.

"The more coffee shops there are, the more crimes there are. To reduce crime, one should reduce coffee shops."