

Activity 15

Name: _____

Crime is a complex social problem with many contributing factors. In this activity, we will explore data from each of the 50 United States. We will look for relationships between crime and other variables. Because crime is complex, many of the relationships will be weak or virtually nonexistent. Therefore, we will be looking for evidence of any type of relationship on the scatterplots, and sometimes you may need to remove outliers.

Open the Excel data file. For each state, data is given on the murder and crime rates, related legislation, population, economics, education and political alignment. Explanations for the data are given at the bottom of the file. If there is another variable of interest to you, feel free to search the Internet for this information.

1. Let's look at the relationship between the murder rate and the crime sum. Since the crime sum takes into account the murder rate, there should be some correlation between these two variables. Use Excel to create a scatterplot and least squares linear regression. Use the murder rate as the explanatory variable. Paste the graph below. Does there appear to be some correlation between these two variables?

2. Some people believe the death penalty serves as a deterrent to potential violent criminals. If this were the case, we would expect murder rates to be significantly lower in states that enforce capital punishment. Let's see if it is:

a.) State the Null and Alternative Hypotheses.

b.) Copy the murder rates and the Death penalty data from Excel into Minitab. Perform a two-sample t test to compare the difference between the two average rates. Paste the Minitab output below.

c.) What do you conclude?

d.) What error could you have made with your decision, and what would be the ramifications?

3. Use Excel to perform a Least Squares Linear Regression between gun control and either murder rate or crime sum (your choice). Use gun control as the explanatory variable. Paste your graph below. Does there appear to be a relationship?

4. Now choose Population, Area or Population Density as the explanatory variable for either Murder Rate or Crime Sum. (Your choice.) Again, paste your graph below and give your conclusions.

5. Use one of the economic indicators as the explanatory variable: Unemployment, Poverty, Total Gross Product, Gross Product per Population, or Public School Funding. For the response, choose either murder rate or crime sum. You got it: Paste and conclude!

6. Now copy the last column (Bush) into Minitab along with either the crime sum or murder rate.

a.) State the Null and Alternative Hypotheses.

b.) Perform a two-sample t test to compare the difference between the two average rates. Paste the Minitab output below.

c.) What do you conclude?

d.) What error could you have made with your decision, and what would be the ramifications?

7. Perform any other analysis between variables that seems interesting to you.
8. Give some final conclusions about crime based on all the above analyses.