Homework
Descriptive Statistics & Correlation
Due November 26

This exercise provides an opportunity for you to demonstrate that you can calculate measures of central tendency, dispersion and correlation, and, more importantly, that you can discern some of the pitfalls of “mindless number crunching.” On the back of this page are four pairs (x, y) pairs of numbers. There are 11 pairs of numbers in each set so that you can complete this assignment by hand, or if you wish, you can use Excel or Spss.

First, complete the following table:

\[
\begin{array}{cccccccc}
  & x_1 & y_1 & x_2 & y_2 & x_3 & y_3 & x_4 & y_4 \\
  \text{Mean} & & & & & & & & \\
  \text{Mode} & & & & & & & & \\
  \text{Median} & & & & & & & & \\
  \text{Range} & & & & & & & & \\
  \text{Standard Deviation} & & & & & & & & \\
  \text{Skew} & & & & & & & & \\
\end{array}
\]

Next, calculate the correlation coefficient for each set of x, y scores. I recommend that you work through one x, y pair by hand (we will get you started in class) and then calculate the correlation coefficient for the remaining three sets with software. In Spss, you can “pick and click” or you can write code such as: correlation variables = x1 to y4 . In Excel, one function that returns the correlation coefficient is pearson(array1, array2). Ask if you want an in-class illustration.

Record the correlation coefficients here:

\[
\begin{array}{c}
  \text{Correlation Coefficient} \\
  x_1, y_1 \\
  x_2, y_2 \\
  x_3, y_3 \\
  x_4, y_4 \\
\end{array}
\]

The last part of the assignment requires you to make judgments about each of these data sets. For each x, y pair, state whether or not a correlation coefficient should be calculated — that is, although software will happily compute the coefficient, is the data such that it is appropriate to do so? There are two ways to make this determination. Some clues might be discernible from the descriptive statistics. Be sure to note and comment on any such clues. Second, plot each x, y pair. Again, you can draw plots by hand if you wish (be neat) or you can use Spss. The command is graph / scatterplot = x1 with y1. You will need to repeat for each x, y pair. In Excel, use the chart wizard and select the template labeled xy (scatter). Remember, the most important part of this assignment is your interpretation of the data. Do not forget to compare differences and similarities between the four x, y pairs.