Looking for Patterns

Graphing and Pivot Tables

EVS 430 Advanced Quantitative Methods

Part of the scientific method is looking for patterns in the natural world. We then guess why they are occurring (a hypothesis) and test our resulting predictions. The gathering of data (observations) is a first step. If a data set is tiny, you might be able to see patterns immediately, but we often have to process that data in order for the patterns to appear. The human eye is great at seeing patterns (we've evolved that ability to enhance our survival), so that's why we usually start by graphing our data. But when we have thousands of observations, tools to group the data by common characteristics aid us. Excel's pivot tables are such tools. Today, we'll be doing exploratory analysis to see what patterns we see.

Graphing

First Month:

1. Open the weather-data file from the class website.
2. As we did last week, create new columns for Year, Month, and Day.
3. Graph the Date versus Tmin, Tmax, and Tavg with a scatterplot.
4. Graph the Data versus PRCP with a scatterplot.
5. I think you'd agree that there's too much data to see patterns

Pivot Tables and Charts

1. Open your data in a pivot table and chart.
2. Try the following groupings:
   - TAVG (average) by year
   - PRCP (sum) by year
   - SNOW (sum) by year
3. What patterns do you see?
4. Now break out data by month.
5. Look at averages, but also look at standard deviations. What does this represent
6. What patterns do you see?

Conditional Functions

1. Like last week, create a new column, Season (winter, spring, summer, fall).
2. Use a conditional function to label December, January, February as Winter; March, April, May as Spring; June, July, and August as Summer; and September, October, and November as Fall.
3. Use the pivot chart to look at each season separately. Any patterns?

To complete this assignment, you need to identify **at least 5 strong patterns.** Create a new tab on your spreadsheet. Describe the pattern and what it represents about the real world. Include a graph for each point. Upload the spreadsheet to Moodle.