Exploration 4B: Relationships Among Data, Statistics, and Boxplots

For this exploration, we'll go back to the sales data for Cool Toys for Tots in two sales regions. The data is shown above in example 3 and can be found in C04 Tots.xls [.rda].

To set the data up for the exploration, do the following:

* Use software to compute the mean, median, minimum, maximum, range, first quartile, third quartile and interquartile range for both regions. Place the statistics to the right of the data (not on a new worksheet, as usual).
* Create side-by-side boxplots for the two regions.

If your software allows it, place the statistics and the boxplots on the same screen with the data, so that you can explore what happens to the statistics and the boxplots as the sales information changes. You'll want to keep notes on what you observe happen (if anything) as you change the data in cells A1:B20. Explore the following questions.

1. What happens to the results (statistics and boxplots) as you change the sales figures? Be sure to keep notes on what kinds of changes you made. It may help to organize these notes into a table with three columns labeled "Change I Made", "Change in Statistics", "Change in Boxplot".
2. What happens to the results (statistics and boxplots) if you decrease the number of stores in the data? What happens if you increase the number of stores? Can you explain this behavior?
3. What happens if many of the stores in the NE region have sales above $500,000? What if many of the stores in the NC region have sales below $225,000?
4. What changes need to be made so that the NE and NC regions perform about the same? What changes will make the NC region perform better? (Careful! There are easy answers to these questions, but go deep and find more realistic ways to get the results.)