IST687 – Visualization Lab

For this Lab, let's explore the mtcars dataset that is included within R.

As we are about halfway through the course, this activity description does not provide the same level of code prompts as previous labs – it is assumed that you remember or can lookup the necessary code. The overall goal of this activity is to use ggplot2 to show different attributes of the mtcars data set.

Please be sure to include both the code and the images that were generated with your assignment.

Please generate the following visualizations:
1. Histogram of MPG
2. Boxplots of mpg by cyl (i.e. 3 box plots, one for all cars with 4 cylinders, one for all cars with 6 cylinders and one with all the cars with 8 cylindars).
3. MultiLine chart of wt on the x-axis, mpg for the y-axis. With a line for each am (i.e. two lines). Also be sure to show the each point on the chart.
4. Barchart with the x-axis being the name of each car, and the height being wt. Make sure to rotate the x-axis labels, so we can actually read the car name
5. Scatter chart with the x-axis being the mpg and the y-axis being the wt of the car. Have the color and the size of each "sybol" (i.e., circle) represent the how fast the car goes (based on the qsec attribute)
6. Heatmap with the weight ('wt') on the x-axis, number of cylinders on the y-axis, and the color representing mpg Note you might have to rotate the x-axis text so you can actually read the different weights.

Learning Goals for this activity:
A. Practice using ggplot2 for multiple different visualizations
B. Increase familiarity with how to make visualizations informative and easy to understand.
C. Refresh and extend knowledge of the data frame object within R.
D. Increase familiarity with built-in datasets within R.

Essential Guide for All IST687 Activities (appears at the end of all activity guides)

1. All IST687 activities work on what some people call a "constructivist learning" model. By developing a product on your own, testing it to find flaws, improving it, and comparing your solution to the solutions of other people, you can obtain a deeper understanding of a problem, the tools that might solve that problem, and a range of solutions that those tools may facilitate. The constructivist model only works to the extent that the student/learner has the drive to explore a problem, be frustrated, fail, try again, possibly fail again, and finally push through to a satisfactory level of understanding.

2. Each IST687 activity builds on skills and knowledge developed in the previous activities, so your success across the span of the course depends at each stage on your investment in earlier stages. Take the time to experiment, play, try new things, practice, improve, and learn as much as possible. These investments will pay off later.

3. Using the expertise of others, the Internet, and other sources of information is not only acceptable - it is expected. You must **always, always, always** give credit to your sources. For example, if you find a chunk of code from r-bloggers.com that helps you with developing a solution, by all means borrow that chunk of code, but make sure to use a comment in your code to document the source of the borrowed code chunk. The discussion boards in the learning management system have been setup to encourage appropriate sharing of knowledge and wisdom among peers. Feel free to ask a question or pose a solution on these boards.

4. Building on the previous point, when submitting code as your solution to the activity, the comments matter at least as much, if not more than the code itself. A good rule of thumb is that every line of code should have a comment, and every meaningful block of code should be preceded by a comment block that is just about as long as the code itself. As noted above, you can use comments to give proper credit to your sources and you can use comments to identify your submission as your own.