**IST687 – Visualize Median Income on a Map**

**This week:** Last week we explored data visualization in R using the ggplot2 package. This week we continue to use ggplot, together with a companion package called ggmap. This companion package enhances the capabilities of ggplot by adding the capability to draw geographic outlines (polygons), shading, labeling, and other map markings. In addition, we will merge datasets using the built-in merge( ) function, which provides a similar capability to a JOIN in SQL. Many analytical strategies require joining data from different sources based on a “key” – a field that two datasets have in common.

**Step A: Load and Merge datasets**

1. Read in the census dataset and the USArrests and merge them   
   (just like HW6)
2. Add the area of each state, and the center of each state, to the merged dataframe, using the ‘state.center’, ‘state.center’ and ‘state.name’ vectors

**Step B: Generate a color coded map**

1. Create a color coded map, based on the area of the state

**Step C: Create a color shaded map of the U.S. based on the Murder rate for each state**

1. Repeat step B, but color code the map based on the murder rate of each state.
2. Show the population as a circle per state (the larger the population, the larger the circle), using the location defined by the center of each state

**Step D: Zoom the map**

1. Repeat step C, but only show the states in the north east  
   *Hint: get the lat and lon of new york city  
   Hint: set the xlim and ylim to NYC +/- 10*