Lab 3F - Maps

Directions: Follow along with the slides and answer the questions in **bold** font in your journal.

## Informative and Fun!

* Maps are some of the most interesting plots to make because the info represents:
* Where we live.
* Where we go.
* Places that interest us.
* Maps are also helpful to display geographic information.
* John Snow (the physician, not the character from *Game of Thrones*...) once famously used [a map to discover how cholera was transmitted.](http://commons.wikimedia.org/wiki/File:Snow-cholera-map-1.jpg#mediaviewer/File:Snow-cholera-map-1.jpg)
* In this lab, we'll use R to create an interactive map of the mtns data we scraped in Lab 3E.

## Getting ready to map

* The map we'll be creating will end up in RStudio's *Viewer* pane.
  + Which means you'll need to alternate between building the map and loading the lab.
* You'll find it very helpful, for this lab, to write all of the commands, including the load\_lab(23) command, as an R script.
  + This way you can edit the code that builds the map and quickly reload the lab.

## Load your data!

* In Lab 3E you created a dataset. Load it into Rstudio now by filling in the blank with the file name of the data.

load("\_\_\_.Rda")

* Didn't finish the lab or save the data file? Ask a friend to share it!

## Build a Basic Map

* Let's start by building a basic map!
* Use the leaflet() function and the mtns data to create the leaf that we can use for mapping.

mtns\_leaf <- leaflet(\_\_\_\_)

* Then, insert mtns\_leaf into the addTiles() function and assign the output the name mtns\_map
* Run mtns\_map in the console to look at your basic map with no data displayed.
  + Be sure to try clicking on the map to pan and zoom.

## Including our data

* Now we can add markers for the locations of the mountains using the addMarkers() function.
  + Fill in the blanks below with the basic map we've created and the values for latitude and longitude.

addMarkers(map = \_\_\_\_, lng = ~\_\_\_\_, lat = ~\_\_\_\_)

* Supply the peak variable, in a similar way as we supplied the lat and long variables, to the popup argument and include it in the code above.
  + **Click on a marker within California and write down the name of the mountain you clicked on.**

## Colorize

* Our current map looks pretty good, but what if we wanted to add some colors to our plot?
* Fill in the blanks below to create a new variable that assigns a color to each mountain based on the state its located.

mtns <- mutate(\_\_\_\_, state\_colors = colorize(\_\_\_\_))

* Now that we've added a new variable, we need to re-build mtns\_leaf and mtns\_map to use it.
  + Create mtns\_leaf and mtns\_map as you did before.
  + Then change addMarkers to addCircleMarkers and keep all of the arguments the same.

## Showing off our colors

* To add the colors to our plot, use the addCircleMarkers like before but this time include color = ~state\_colors as an argument.
* It's hard to know just what the different colors mean so let's add a legend.
* First, assign the map with the circle markers as mtns\_map.
* Then, fill in the blanks below to place a legend in the top-right hand corner.

addLegend(\_\_\_\_, colors = ~unique(\_\_\_\_), labels = ~unique(\_\_\_\_))