Intro to R: Week 6

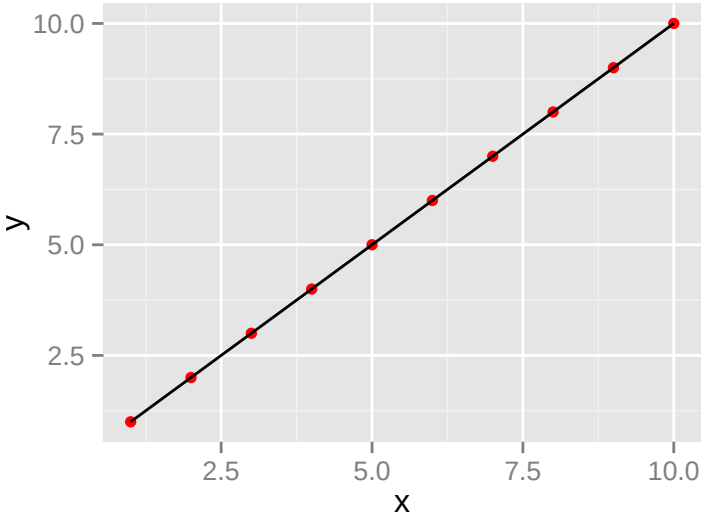
Topics Covered: Plotting and Mapping Data

I like to think that Excel:`R`::`plot`:`ggplot2`. Like `R`, `ggplot2` requires more of an upfront time investment to learn but will save you time (and produce better results!) in the long run. This will be a very brief introduction to familiarize you with the (quirky) syntax of ggplot and some of the options available for plotting and mapping data.

Task 1: Exploring ggplot syntax

`ggplot` works by incrementally adding layers to a plot object using the `+` symbol.

Step 1.1 Create a very simple data frame with values of x from 1:10 and values of y from 1:10. Plot x versus y as points and lines and make the points red.

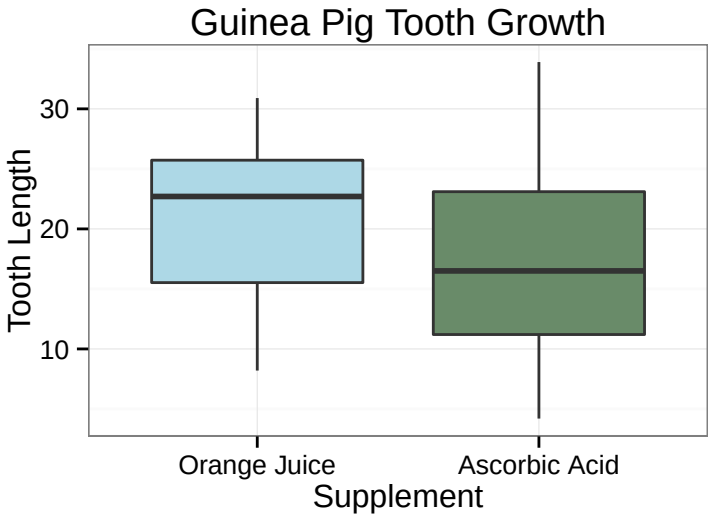


Things to notice:

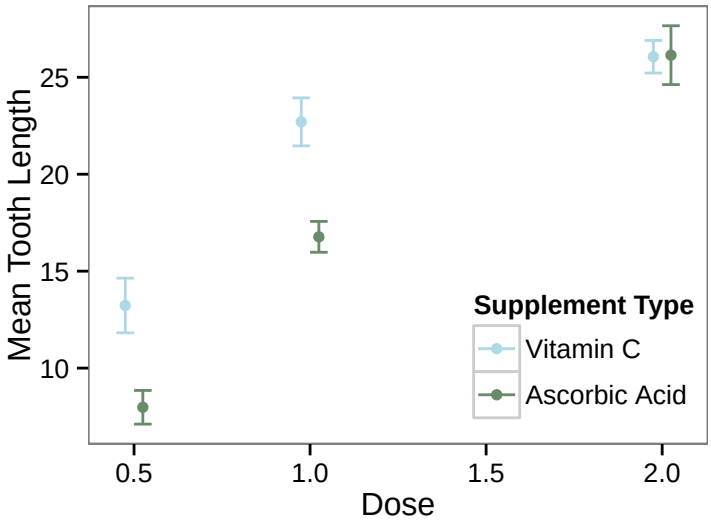
- Data must be contained within a data frame and in "long" format (melted)
- Order matters. In this case, the line is plotted on top of the points
- Data assigned in the first call to ggplot are globally available to all layers
- Properties (like color or size) that depend on a variable in the data frame must be mapped to that variable within an aes() statement

Task 2: Boxplots and Error Bars with the Guinea Pig Tooth Dataset

Step 2.1 Load the ToothGrowth dataset and make a boxplot of supplement vs. tooth length.

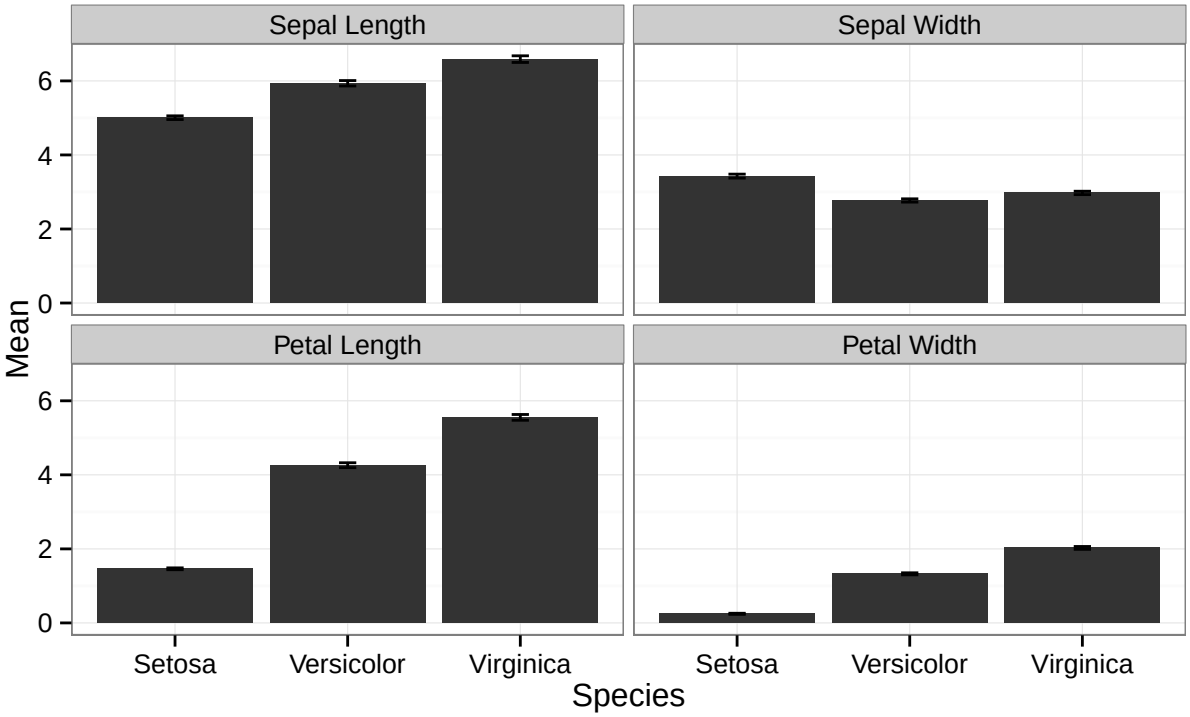


Step 2.2 Create a scatterplot of dose v. mean tooth length for both supplement types. Add bars to represent the standard error of the mean.



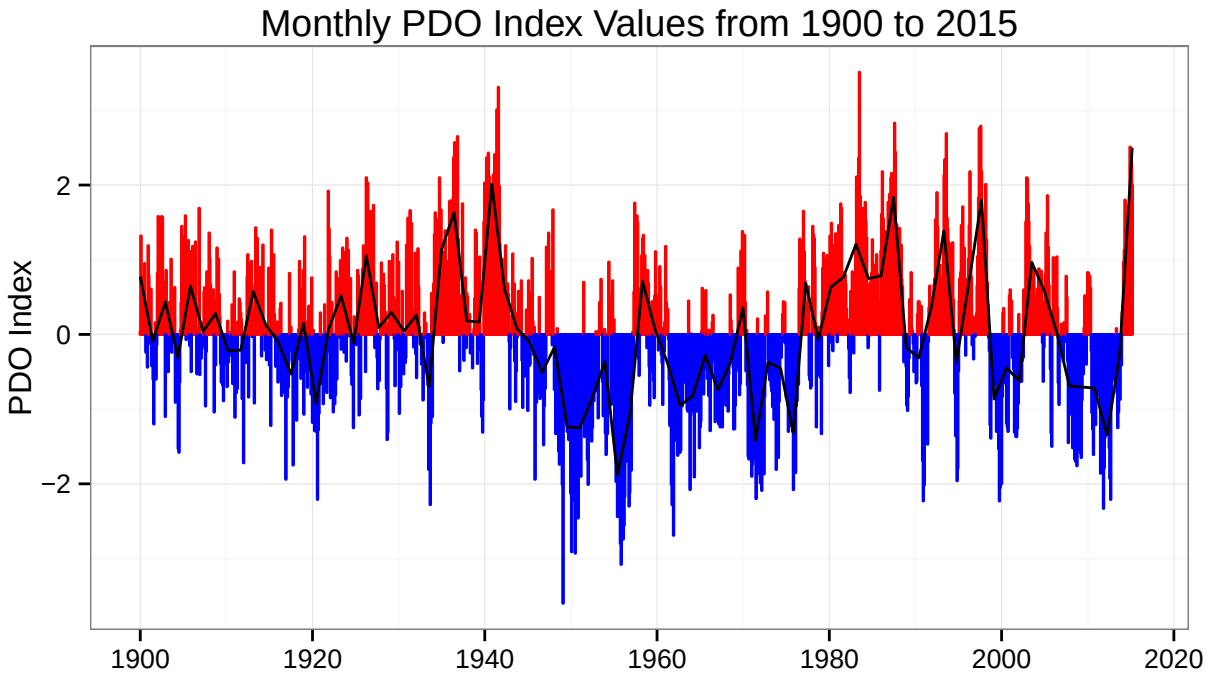
Task 3: Barplots with the Iris Dataset

Step 3.1 Load the built-in iris dataset and create barplots of mean sepal length, sepal width, petal length, and petal width by species in four panels.



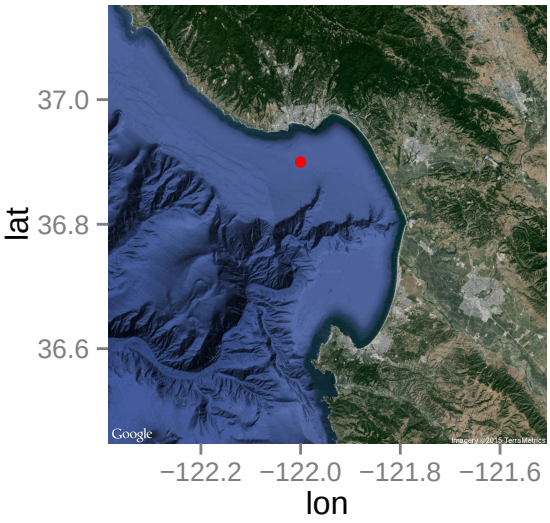
Task 4: Plotting anomaly data

Step 4.1 Plot the PDO index in `PDO.txt` over time so that negative values are blue and positive values are red. Add a Loess smooth in black. Save the plot to a pdf.



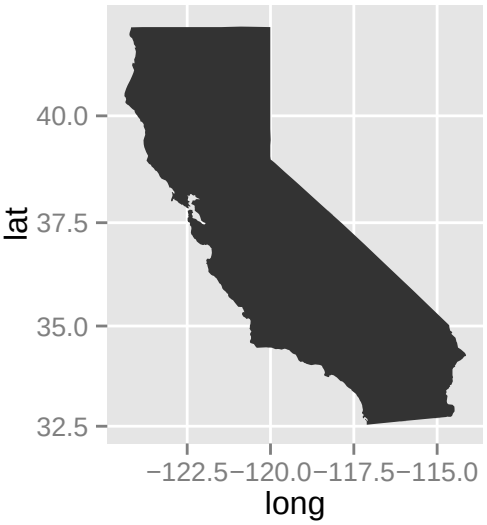
Task 5: Exploring `ggmap`

Step 5.1 Use `get_map()` and `ggmap()` to plot a satellite map of Monterey Bay. Add a red point at 36.9 deg N, -122.0 deg W.

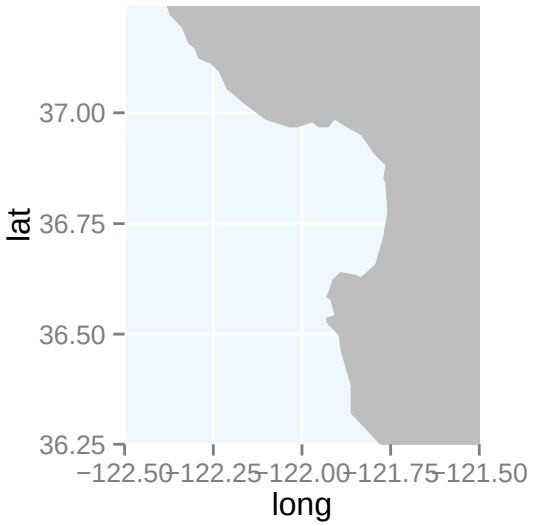


Task 6: Mapping with `ggplot`

Task 6.1 Use `map_data()` and `ggplot()` to plot a map of California



Task 6.2 Adjust `coord_map` to zoom in Monterey Bay. Make the ocean blue and the land gray.



Task 6.3 Use the coastline coordinates in `mbaycoast.csv` and the mooring locations in `cpods.csv` to plot a more detailed map of Monterey Bay with labeled points at the mooring locations.