Week 16 Programming Assignment

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Due: 6/12/2019

Preparation

1. Install and load the packages: `tidyverse`, `broom`, `rgdal`, `rgeos`, `ggmap` (and register your API key)
2. Download the map data: 直轄市、縣市界線 (TWD97 經緯度) http://data.gov.tw/node/7442

3. Download the obesity data and save it in your working directory
    - Source: 102 年 18 歲以上過重及肥胖率-依縣市別分 http://data.gov.tw/node/14421
4. Set the working directory and inspect the data

Assignments

Goal: Create an choropleth map of obesity rates
Steps to draw the map:

1. Prepare the map data
    - Use the function `readOGR()` to read the shape file that you have downloaded earlier and save it to an object (ex: `tw.map`)
    - Use the function `tidy()` to the map object and save it as a dataframe (ex: `tw.map.ft`). Remember to set the `region` option.

- Use the `filter` function to keep only observations with longitude between 118-123 and latitude between 21-27 (Sorry, 太平島...)
- Inspect the dataframe (`tw_map.ft`) and the data segment of the object (tw.map@data) using the str function
- Use the function `inner_join()` to the data frame (`tw.map.ft`) and the data segment of the object (`tw.map@data`). Save it as a new data frame (ex: `countymap.m`)

2. Prepare the value data

   - Use the `read_csv` function to import obesity.csv and save it as a dataframe (ex: `ob`)
   - Tips: You should check the following options to ensure that the data is imported properly
   - Appropriate encoding: `locale=locale(encoding="big5")`
   - Set "`skip = 1`" to skip the first line of CSV file
   - Use `col_names= c("var_1" , "var_2", ... )` to name your variables (You should pick appropriate names)
   - Check the data frame and determine the variable to be used as the key in merging with the map data

3. Merge the obesity data (`ob`) with the map data that you have created previously (tw.map.ft)

   - Use `str` and `levels` functions to inspect both data frames before merging*
   - Use the `inner_join` function to merge both data sets
   - Sort the merged data frame using the arrange function
   - Before adding Google map, you can first use `ggplot` to draw your choropleth map. Is there a county missing? Why?
   - If you need to replace the value of a variable, you can use the `replace` function within `mutate` to change its value. EX:

```
ob <- mutate(ob, county = replace(county, county=="XXX", "YYY"))
```

4. Draw the map

   - Use `qmap` to select Taiwan as the base map. Pick an appropriate zoom level, color scheme, and map type
   - Add geom_polygon to draw the merged data on the map
   - Pick appropriate color palettes and alpha levels for your polygon
   - Save the final map with appropriate aspect ratio

   Submit your source code and map to the course website
   Your map should look like the following: