

GIS III: Lab 3

Rachel Steiner-Dillon

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```
library(tidyverse)
library(tidycensus)
library(tigris)
library(sf)
library(ggplot2)
library(tmap)
library(jsonlite)
```

This project maps the bikeshare json file obtained from bayareabikeshare.com, and San Francisco census tracts obtained from the US Census API.

Step 1: Prepare Shapefile

Get California census tract shapefile

```
readRenviron("~/Renviron")
options(tigris_class = "sf")
options(tigris_use_cache = TRUE)

ca_tracts <- get_acs(geography = 'tract',
                    variables = c(total_pop = 'B01001_001'),
                    state = '06',
                    geometry = TRUE)
```

Get tracts in San Francisco county that have a population greater than 0
This eliminates an island off the Pacific Coast, which has no residents

```
sf_tracts <- ca_tracts %>%
  filter(str_detect(NAME, 'San Francisco')) %>%
  filter(estimate > 0)

plot(sf_tracts['geometry'])
```



Step 2: Prepare Bikeshare Points

Get Bay Area bikeshare data and convert lat-long coordinates to point data

```
bikes<- fromJSON(txt="http://feeds.bayareabikeshare.com/stations/stations.json")
bikes_table <- data.frame(bikes[2])

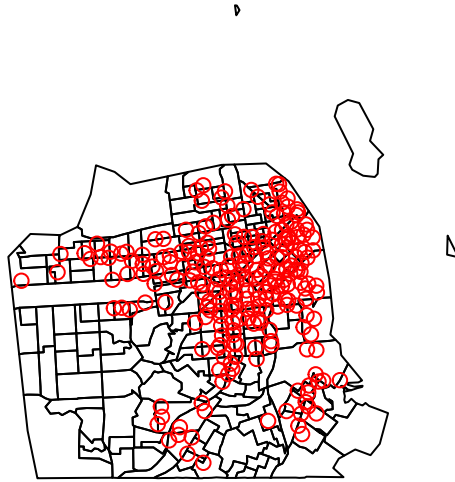
bike_points = st_as_sf(bikes_table,
                        coords = c('stationBeanList.longitude', 'stationBeanList.latitude'),
                        crs = 4326)
```

Subset stations to include only those in san Francisco

```
sf_tracts = st_transform(sf_tracts, 4326)

sf_bikes = bike_points$geometry[sf_tracts$geometry]

plot(sf_tracts['geometry'])
plot(sf_bikes, add = TRUE, col='red')
```



Step 3: Create Final Map

```
sf_tracts$num_bikes = lengths(st_intersects(sf_tracts, bike_points))

tm_shape(sf_tracts) +
  tm_borders() +
  tm_bubbles(size = 'num_bikes', col='num_bikes', palette = 'Reds',
             legend.size.show=FALSE, title.col = 'Bikeshare Stations')
```

