01 Mini Project: Static Maps

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This project features two maps (a static and interactive version) that display data from the Centers for Disease Control and Prevention (CDC). Data on Covid-19 levels was collected from February 2022 to May 2023 on a county level. This project displays data recorded on May 11, 2023. For the purposes of this state-level project, I will use the average of county-level data for each state to display the new Covid-19 cases per 100k within the previous 7 days. Data can be accessed here.

Additionally, this project contains two maps (a static and interactive version) that display the 2024 Presidential Election results. Election data is from the Federal Election Commission (FEC) and can be found at this link.

The interactive maps in this project can be found here (I think…).

```
library(tidyverse)
```

```
-- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
v dplyr     1.1.4     v readr     2.1.5
v forcats   1.0.0     v stringr   1.5.1
v ggplot2   3.5.1     v tibble    3.2.1
v lubridate 1.9.4     v tidyr     1.3.1
v purrr     1.0.4
-- Conflicts ------------------------------------------ tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()    masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to becom
```

```
library(mdsr)
library(maps)
```

```
Attaching package: 'maps'
```

```
The following object is masked from 'package:purrr':

    map
```

```r
library(viridis)
```

```
Loading required package: viridisLite

Attaching package: 'viridis'

The following object is masked from 'package:maps':

    unemp
```

```r
library(lubridate)
library(leaflet)
library(sf)
```

```
Linking to GEOS 3.11.0, GDAL 3.5.3, PROJ 9.1.0; sf_use_s2() is TRUE
```

```r
library(RColorBrewer)
```

COVID-19 Data

```r
#data set from the CDC
cdc_data <- read.csv("~/Downloads/01_United_States_COVID-19_Community_Levels_by_County_202502
```

```r
covid_data <- cdc_data |>
  filter(date_updated == "2023-05-11",
         !(state %in% c("Puerto Rico",
                        "American Samoa",
                        "Commonwealth of the Northern Mariana Islands",
                        "United States Virgin Islands",
                        "Guam")))
```

```r
states_polygon <- as_tibble(map_data("state")) |>
  select(region, group, order, lat, long)

states_sf <- read_sf("https://rstudio.github.io/leaflet/json/us-states.geojson") |>
  select(name, geometry)
```

```
#convert county-level data to state-level data
covid_state_level_data <- covid_data |>
  filter(covid_cases_per_100k != "NA") |>
  group_by(state) |>
  summarize(covid_cases_per_100k = mean(covid_cases_per_100k))
```

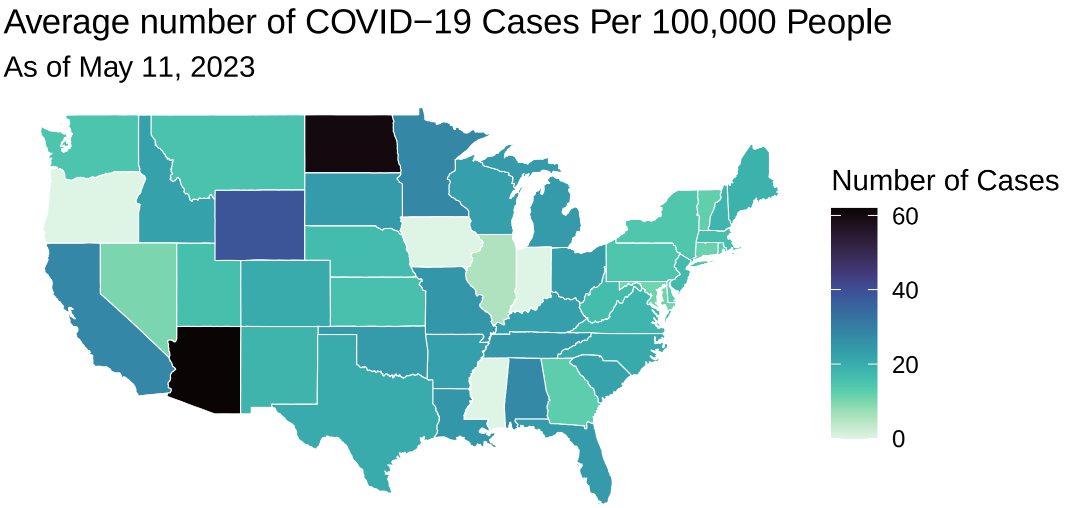
```
#format state names in all data sets so they match
covid_state_level_data <- covid_state_level_data |>
  mutate(state = str_to_lower(state),
         state = str_replace_all(state, " ", ""),
         state = str_squish(state))

states_sf <- states_sf |>
  mutate(name = str_to_lower(name),
         name = str_replace_all(name, " ", ""))

states_polygon <- states_polygon|>
  mutate(region = str_replace_all(region, " ", ""))
```

```
#join covid data with map data
covid_map <- covid_state_level_data |>
  right_join(states_polygon, by =c("state" = "region"))

covid_map <- covid_map |>
  right_join(states_sf, by =c("state" = "name"))
```

Static Map #1

This is map of the continental United States that shows the average 7 day total of new COVID-19 cases per 100,000 people in each state. Data was collected on May 11, 2023 and the average number of new COVID-19 cases ranges from just above 0 to about 60 per 100,000 people. The lowest COVID-19 levels are shown in light blue and the highest are shown in dark, deep blue. Overall, most of the United States had extremely low levels of average new COVID-19 cases on May 11. North Dakota and Arizona, however, had the highest levles at about 60 cases per 100k people.

```
covid_map |>
  ggplot(mapping = aes(x = long, y = lat,
                       group = group)) +
  geom_polygon(aes(fill = covid_cases_per_100k), color = "white", linewidth = 0.2) +
  labs(fill = "Number of Cases",
       x = "",
       y = "",
       title = "Average number of COVID-19 Cases Per 100,000 People",
       subtitle = "As of May 11, 2023") +
  coord_map() +
  theme_void() +
  scale_fill_viridis(option = "mako", direction = -1)
```


Average number of COVID−19 Cases Per 100,000 People

As of May 11, 2023

Election Data

Static Map #2

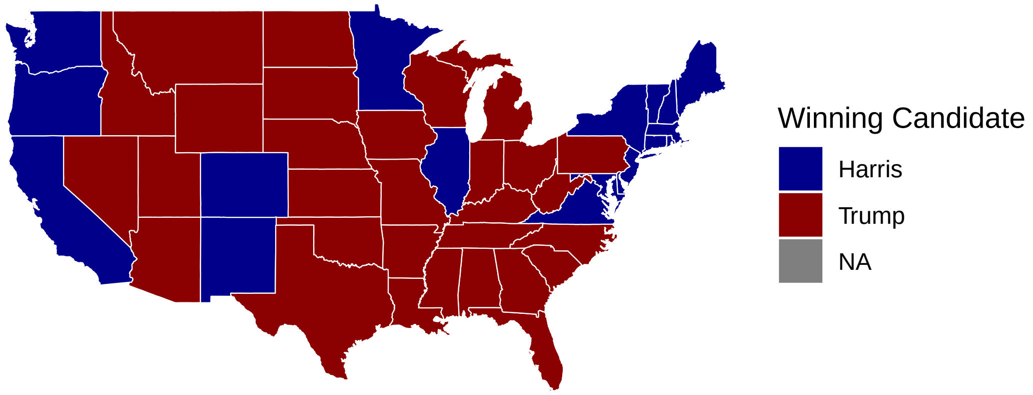
This map of the continental United States shows Electoral College Results from the 2024 Presidential Election. States in which Electoral College votes were awarded to Donald Trump are colored in red and states in which Electoral College votes were awarded to Kamala Harris are colored in blue. Also to note, Maine and Nebraska split Electoral College votes to match the popular vote, so these states are colored by the candidate who won the majority Electoral College votes. As we can see, Donald Trump revived Electoral College votes from many more states than Kamala Harris, who won the majority of coastal states. It is important to note that this map only represents Electoral College votes, so the closeness of the election can not be determined simply by counting the number of states awarded to each candidate.

```
#data from the federal election commission
election_data <- read.csv("~/Downloads/2024presgeresults.csv")
election_data <- election_data |>
  select(STATE, ELECTORAL.VOTE..TRUMP..R., ELECTORAL.VOTE..HARRIS..D., HARRIS, TRUMP) |>
  rename(state = STATE,
         Trump = ELECTORAL.VOTE..TRUMP..R.,
         Harris = ELECTORAL.VOTE..HARRIS..D.,
         votes_harris = HARRIS,
         votes_trump = TRUMP) |>
  pivot_longer(cols = c(Trump, Harris),
               names_to ="candidate_won",
               values_to = "electoral_votes") |>
  filter(electoral_votes != "NA") |> #remove observations that show the loosing candidate in
  slice(-30, -20)
#slice to remove rows 30 and 20 which are second observations of maine and nebraska due to th
#the observation recording the winning candidate is kept.

election_data <- election_data |>
  mutate(state = str_to_lower(state),
         state = str_replace_all(state, " ", ""),
         state = str_squish(state)) |>
  mutate(votes_harris = str_squish(votes_harris),
         votes_trump = str_squish(votes_trump))
```

```
electoral_map <- election_data |>
  right_join(states_polygon, by =c("state" = "region"))

electoral_map <- electoral_map |>
  right_join(states_sf, by =c("state" = "name"))
```

```
electoral_map |>
  ggplot(mapping = aes(x = long, y = lat,
                       group = group)) +
  geom_polygon(aes(fill = candidate_won), color = "white", linewidth = 0.2) +
  labs(fill = "Winning Candidate",
       x = "",
       y = "",
       title = "2024 Presidential Election Electoral College Map") +
  coord_map() +
  scale_fill_manual(values = c("Harris" = "darkblue", "Trump" = "darkred")) +
  theme_void()
```

2024 Presidential Election Electoral College Map


Winning Candidate
Harris
Trump
NA