ECON-320-Lab-7

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Introduction

- A choropleth map is a type of thematic map where areas are shaded or colored in proportion to a specific variable.
- Shapefiles are geospatial vector data formats used in GIS to store the geometry and attributes of geographic features — like points, lines, and polygons.
- We will not cover shape files and directly access data which contains the polygons through maps package.

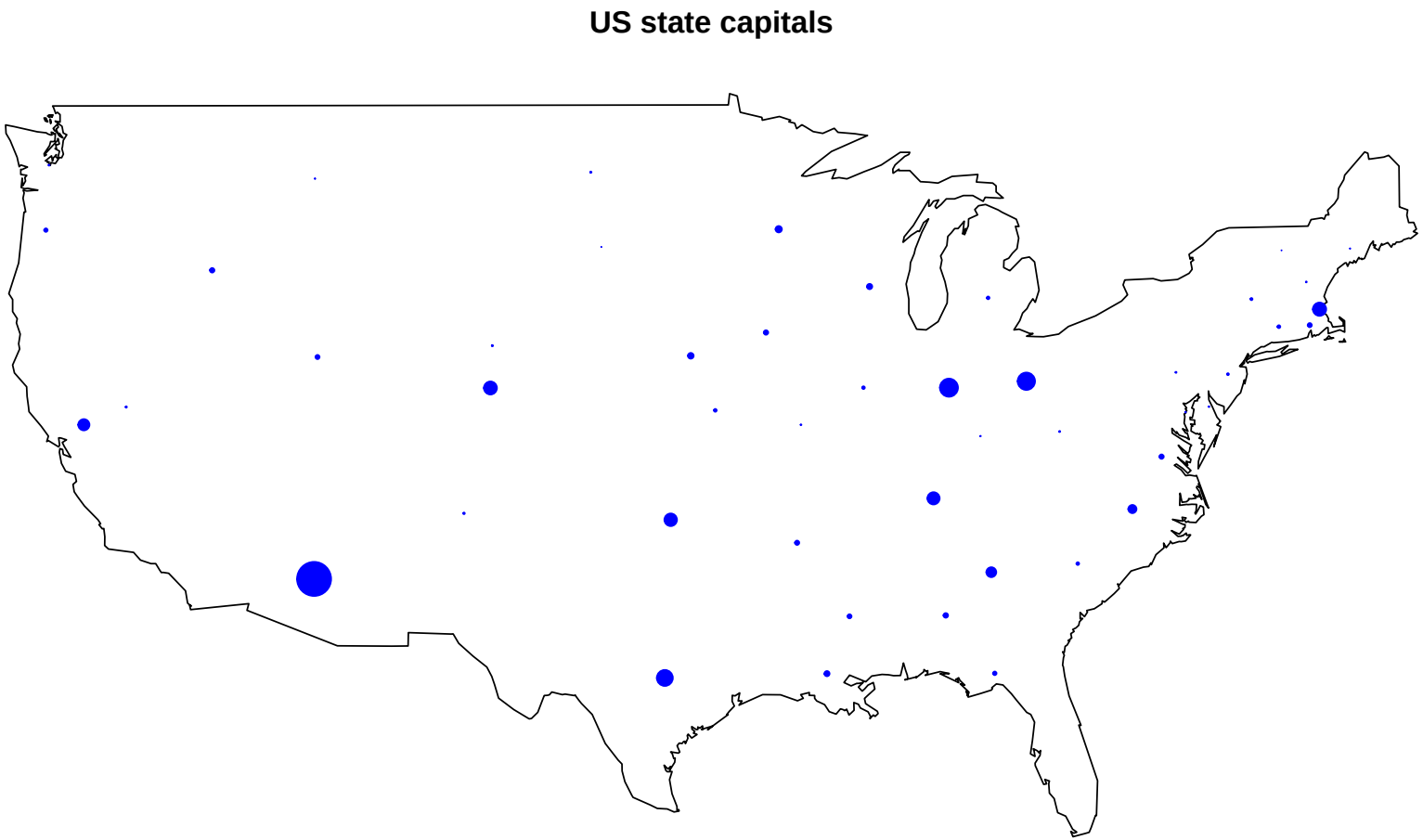
Packages

```
library(tinytex)

library(tidyverse)

library(dslabs)
library(dplyr)

library(ggplot2)

library(tibble)

library(maps)
library(mapdata)
library(usmap)
```

US State Capitals

```
data(us.cities)

#head(us.cities)


plot_us_capitals <- function() {
  map(database = "usa")
  capitals <- subset(us.cities, capital == 2)
  points(x = capitals$long, y = capitals$lat, col = "blue",
         cex = capitals$pop /500000, pch = 19)
  title("US state capitals")
}
```

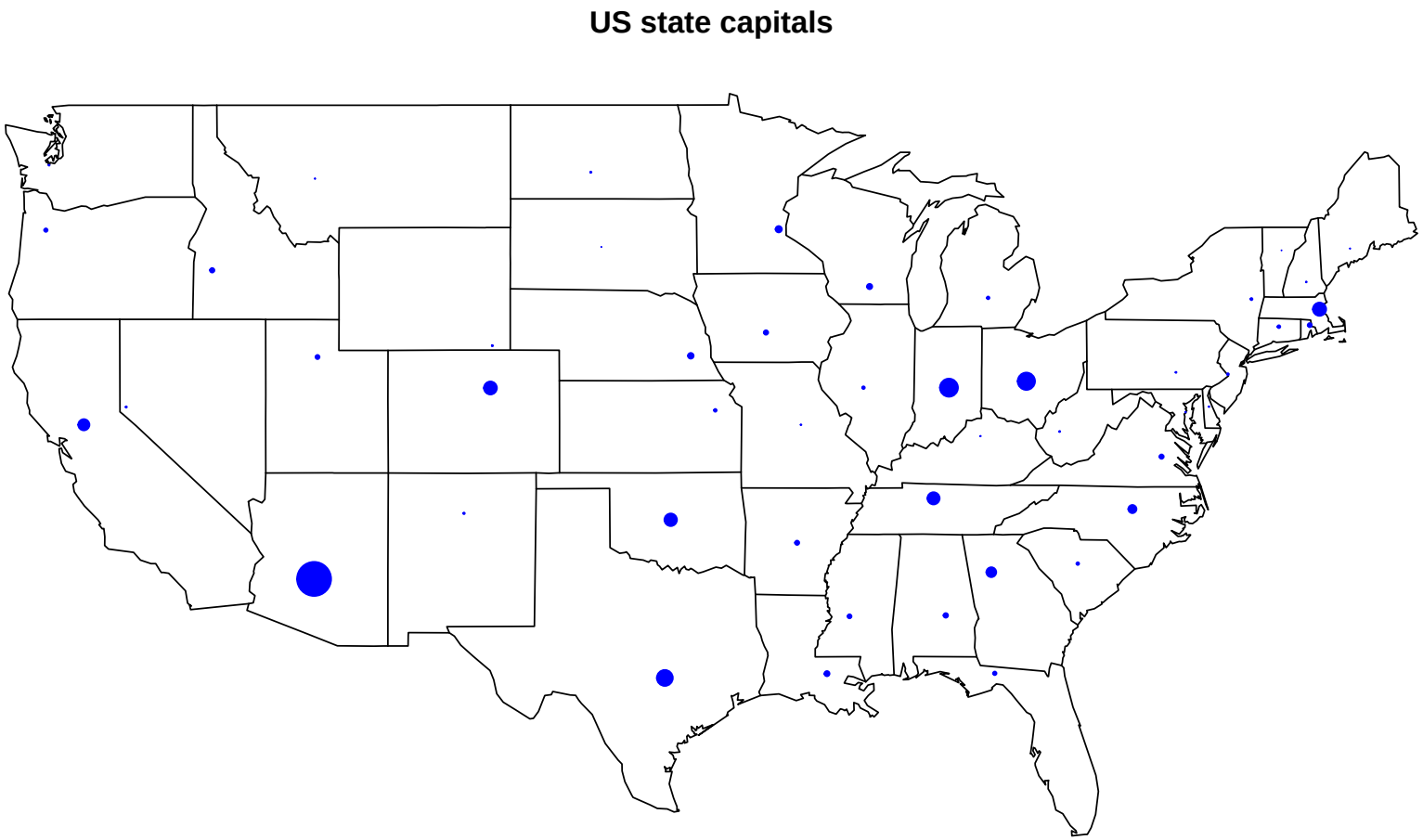
US State Capitals



US State Boundaries

```
plot_us_states <- function() {
map(database = "state")
capitals <- subset(us.cities, capital == 2)
points(x = capitals$long, y= capitals$lat, col = "blue",
cex = capitals$pop / 500000, pch=19)
title("US state capitals")
}
```

US States

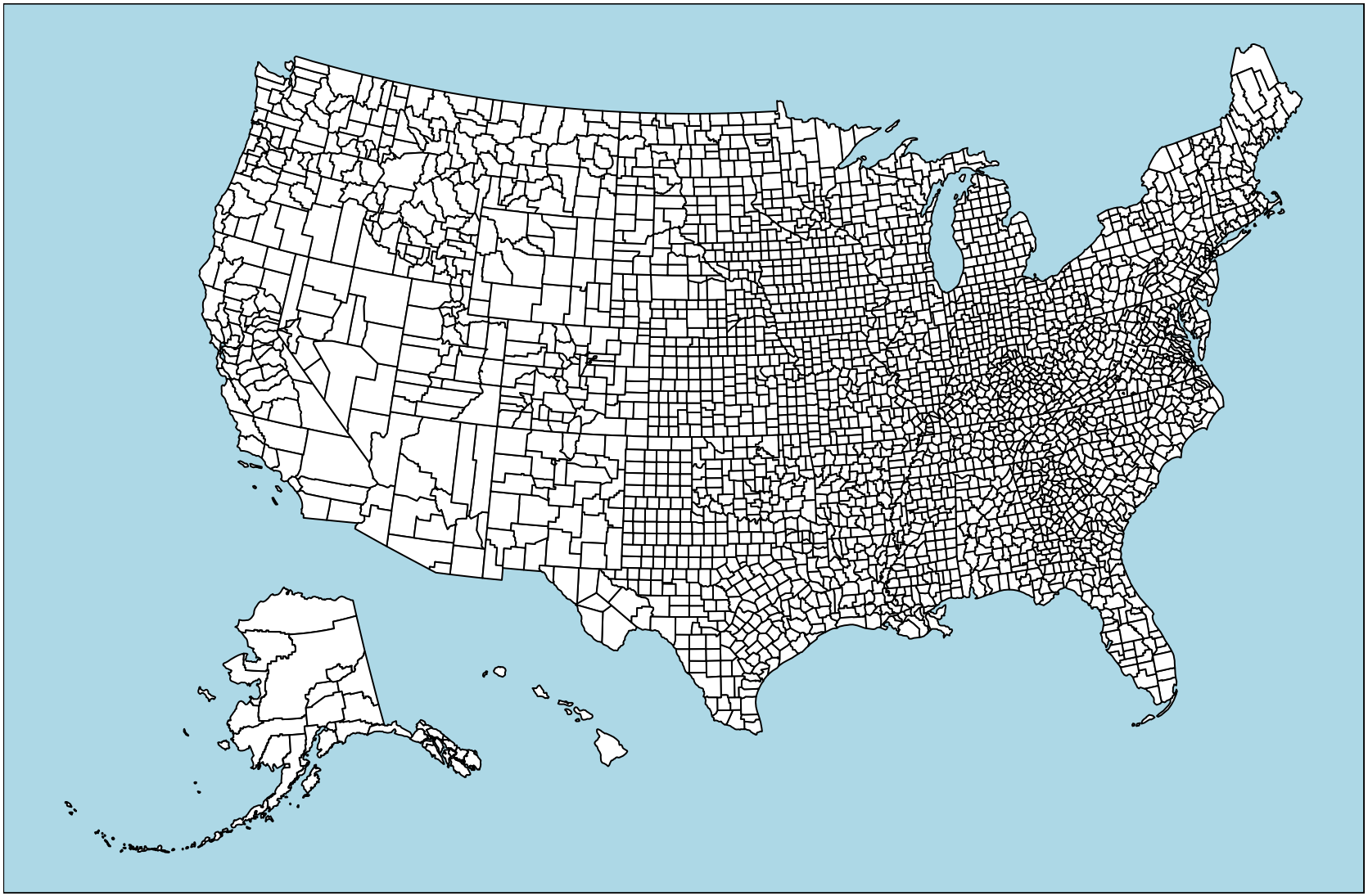


US Counties

```
plot_us_counties <- function() {
plot_usmap(regions = "counties") +
labs(title = "US Counties",
subtitle = "") +
theme(panel.background = element_rect(color = "black",
fill = "lightblue"))
}
```

US Counties

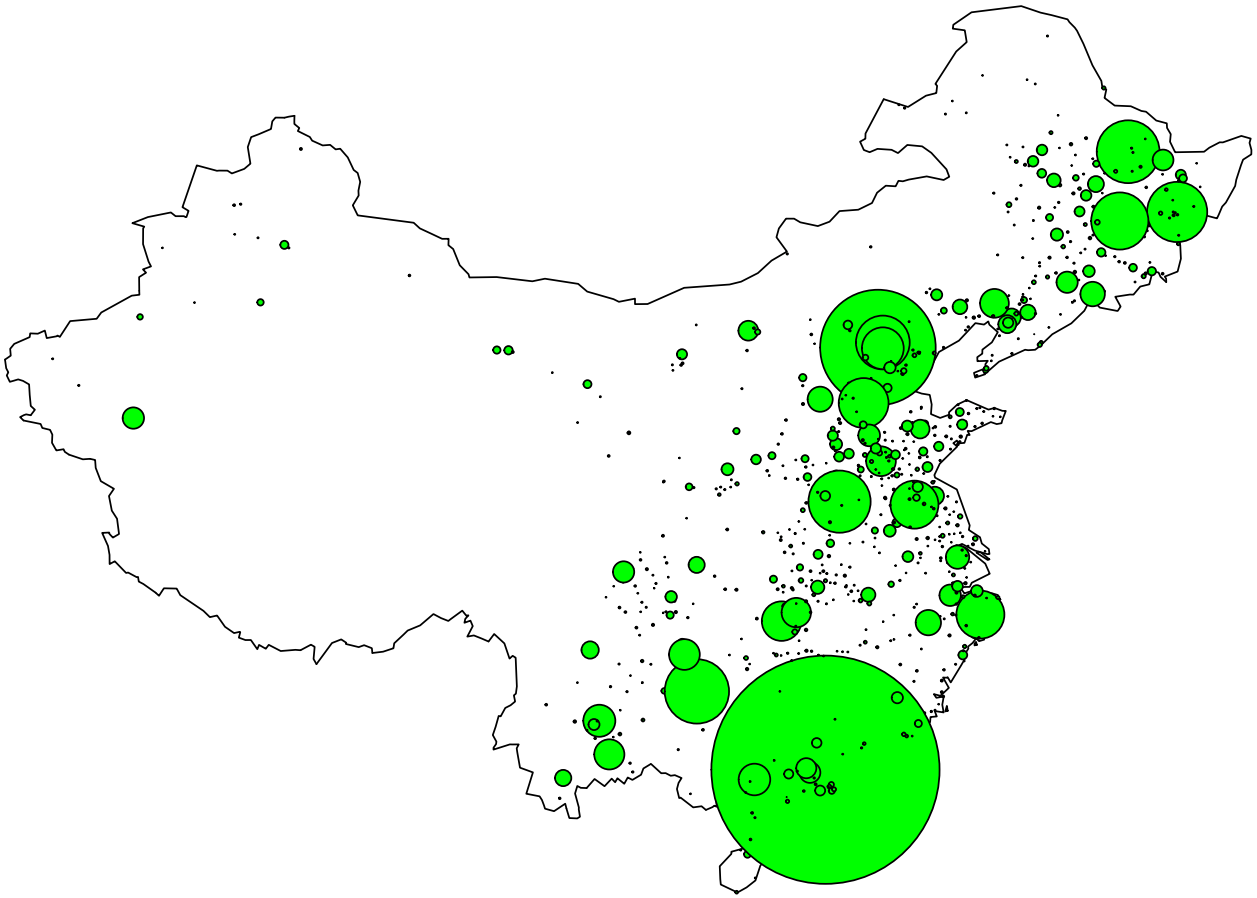
US Counties



China Cities:

```
plot_china_cities <- function() {

map("world", "China")

# Load world cities dataset
data(world.cities)

# Subset all cities in Italy (or capitals only if needed)
china_cities <- subset(world.cities, country.etc == "China")

# Plot cities using map.cities
  map.cities(x = china_cities,
             pch = 21,
             bg = "green",
             col = "black",
             cex = china_cities$pop/500000)
}
```

China Cities:



Selected US States

```
plot_usmap(include = c("CA", "ID", "NV", "OR", "WA")) +
labs(title = "Western US States",
subtitle = "In Pacific Timezone.")
```

Figure 1: Western States

Choropleth Map of US Population (2022)

```
plot_usa_pop <- function() {
plot_usmap(data = statepop, values = "pop_2022",
color = "red") +
scale_fill_continuous(low = "white", high = "red",
name = "Population (2022)",
label = scales::comma) +
theme(legend.position = "right")
}
```

Choropleth Map of US Population (2022)