GIS III: Lab 2

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```
library(sf)
library(dplyr)
library(tidyr)
library(spData)
library(ggplot2)

#This lab uses the us_states dataset from the spData package authored by Bivand et al
```

Summary Statistics

```
data(us_states)

summary(us_states$AREA)
```

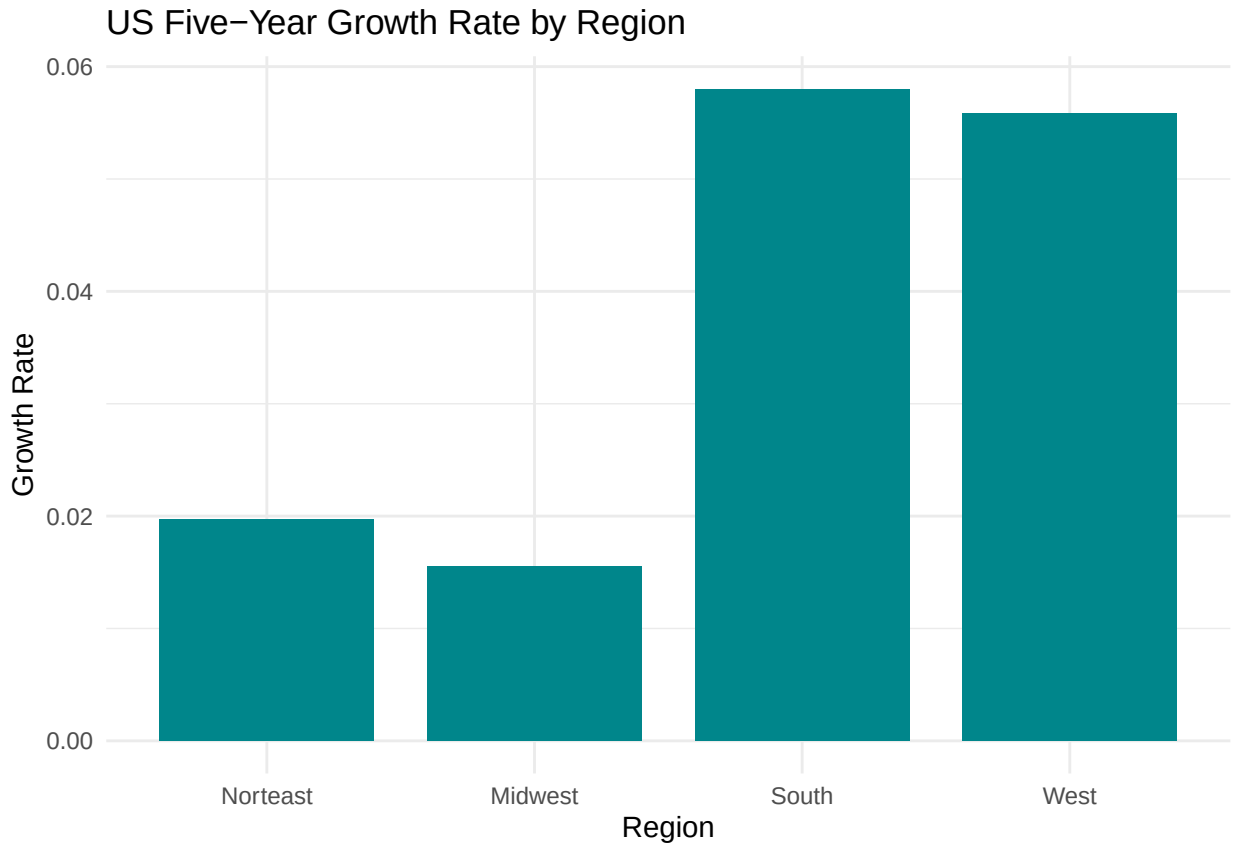
```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
##    178.2  93648.4 144954.4 159327.3 213037.1 687714.3
```

```
regional_pop <- us_states %>%
  group_by(REGION) %>%
  summarize(pop_15 = sum(total_pop_15),
            pop_10 = sum(total_pop_10),
            average_pop_15 = mean(total_pop_15),
            max_pop_15 = max(total_pop_15),
            min_pop_15 = min(total_pop_15),
            pop_growth = (sum(total_pop_15) - sum(total_pop_10)))

regional_pop$growth_rate = regional_pop$pop_growth / regional_pop$pop_10

regional_df = st_drop_geometry(regional_pop)
regional_df[, c(1, 4, 5, 6, 8)]
```

```
## # A tibble: 4 x 5
##   REGION   average_pop_15 max_pop_15 min_pop_15 growth_rate
##   <fct>             <dbl>      <dbl>      <dbl>       <dbl>
## 1 Norteast       6221058.   19673174     626604      0.0197
## 2 Midwest        5628866.   12873761     721640      0.0155
## 3 South          6975022.   26538614     647484      0.0580
## 4 West           6569459.   38421464     579679      0.0558
```

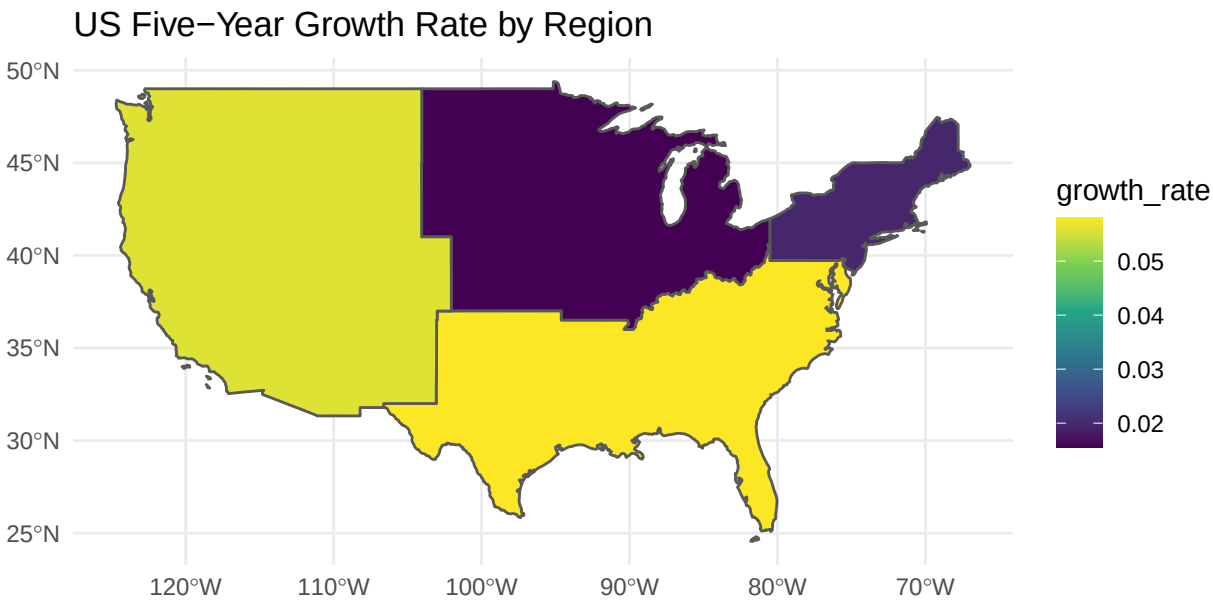
Non-Spatial Plot

```
ggplot(data = regional_pop, aes(x=REGION, y=growth_rate)) +
  geom_bar(stat='identity', width = 0.8, fill='turquoise4') +
  labs(title='US Five-Year Growth Rate by Region',
       x='Region', y='Growth Rate') +
  theme_minimal()
```



Spatial Plot

```
ggplot(data = regional_pop) +
  geom_sf(aes(fill = growth_rate)) +
  scale_fill_viridis_c() +
  ggtitle('US Five-Year Growth Rate by Region') +
  theme_minimal()
```


US Five−Year Growth Rate by Region
50°N
45°N
40°N
35°N
30°N
25°N
120°W
110°W
100°W
90°W
80°W
70°W
growth_rate
0.05
0.04
0.03
0.02