Murders

Introduction

This is a report on 2010 gun murder rates obtained from FBI reports. The original data was obtained from this Wikipedia page.

We are going to use the following library:

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 3.5.2
```

and load the data we already wrangled:

```
load("rdas/murders.rda")
```

Least populated states

```
murders %>% arrange(population) %>% head()
```

```
## # A tibble: 6 x 6
##   state                abb   region        population total   rate
##   <chr>                <chr> <fct>              <dbl> <dbl>  <dbl>
## 1 Wyoming              WY    West              563626     5  0.887
## 2 District of Columbia DC    South             601723    99 16.5
## 3 Vermont              VT    Northeast         625741     2  0.320
## 4 North Dakota         ND    North Central     672591     4  0.595
## 5 Alaska               AK    West              710231    19  2.68
## 6 South Dakota         SD    North Central     814180     8  0.983
```

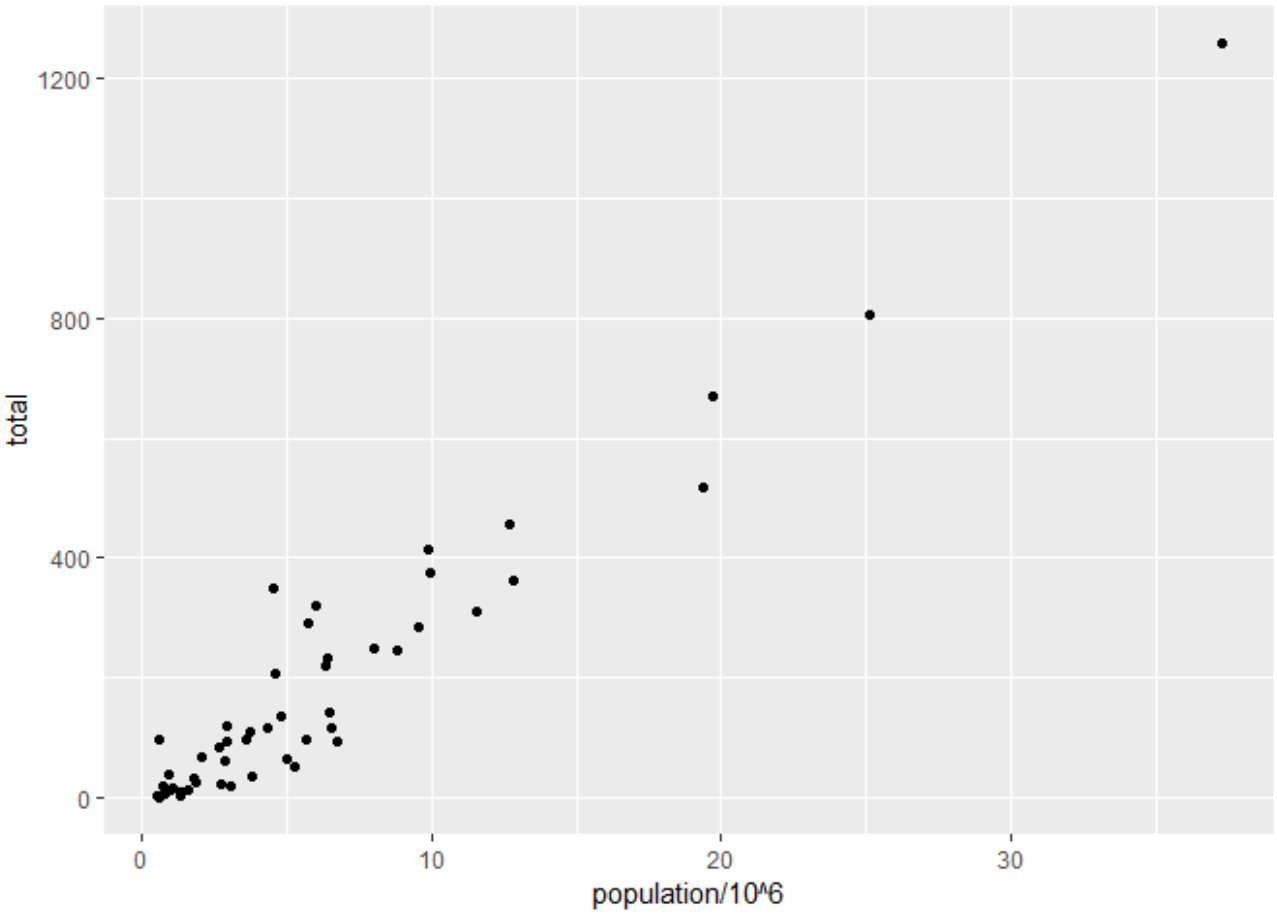
6 Most populated states

```
murders %>% arrange(desc(population)) %>% head()
```

```
## # A tibble: 6 x 6
##   state        abb   region        population total  rate
##   <chr>        <chr> <fct>              <dbl> <dbl> <dbl>
## 1 California   CA    West            37253956  1257  3.37
## 2 Texas        TX    South           25145561   805  3.20
## 3 Florida      FL    South           19687653   669  3.40
## 4 New York     NY    Northeast       19378102   517  2.67
## 5 Illinois     IL    North Central   12830632   364  2.84
## 6 Pennsylvania PA    Northeast       12702379   457  3.60
```

Total murder reported and state population plot

```
murders %>% ggplot() + geom_point(aes(x = population/10^6, y = total))
```



6 states with lowest murder rates

```
murders %>% arrange(rate) %>% head()
```

```
## # A tibble: 6 x 6
##   state         abb   region        population total  rate
##   <chr>         <chr> <fct>              <dbl> <dbl> <dbl>
## 1 Vermont       VT    Northeast         625741     2 0.320
## 2 New Hampshire NH    Northeast        1316470     5 0.380
## 3 Hawaii        HI    West             1360301     7 0.515
## 4 North Dakota  ND    North Central     672591     4 0.595
## 5 Iowa          IA    North Central    3046355    21 0.689
## 6 Idaho         ID    West             1567582    12 0.766
```

6 states with highest population

```
murders %>% arrange(desc(rate)) %>% head()
```

```
## # A tibble: 6 x 6
##   state                abb   region        population total  rate
##   <chr>                <chr> <fct>              <dbl> <dbl> <dbl>
## 1 District of Columbia DC    South             601723    99 16.5
## 2 Louisiana            LA    South            4533372   351  7.74
## 3 Missouri             MO    North Central    5988927   321  5.36
## 4 Maryland             MD    South            5773552   293  5.07

## 5 South Carolina       SC    South            4625364   207  4.48
## 6 Delaware             DE    South             897934    38  4.23
```

10 states with least murder rate

```
murders %>% top_n(10, rate)
```

```
## # A tibble: 10 x 6
##    state                abb   region        population total  rate
##    <chr>                <chr> <fct>              <dbl> <dbl> <dbl>
##  1 Arizona              AZ    West             6392017   232  3.63
##  2 Delaware             DE    South             897934    38  4.23
##  3 District of Columbia DC    South             601723    99 16.5
##  4 Georgia              GA    South            9920000   376  3.79
##  5 Louisiana            LA    South            4533372   351  7.74
##  6 Maryland             MD    South            5773552   293  5.07
```

```
##  7 Michigan            MI    North Central    9883640   413  4.18
##  8 Mississippi         MS    South            2967297   120  4.04
##  9 Missouri            MO    North Central    5988927   321  5.36
## 10 South Carolina      SC    South            4625364   207  4.48
```

Higest murder rates

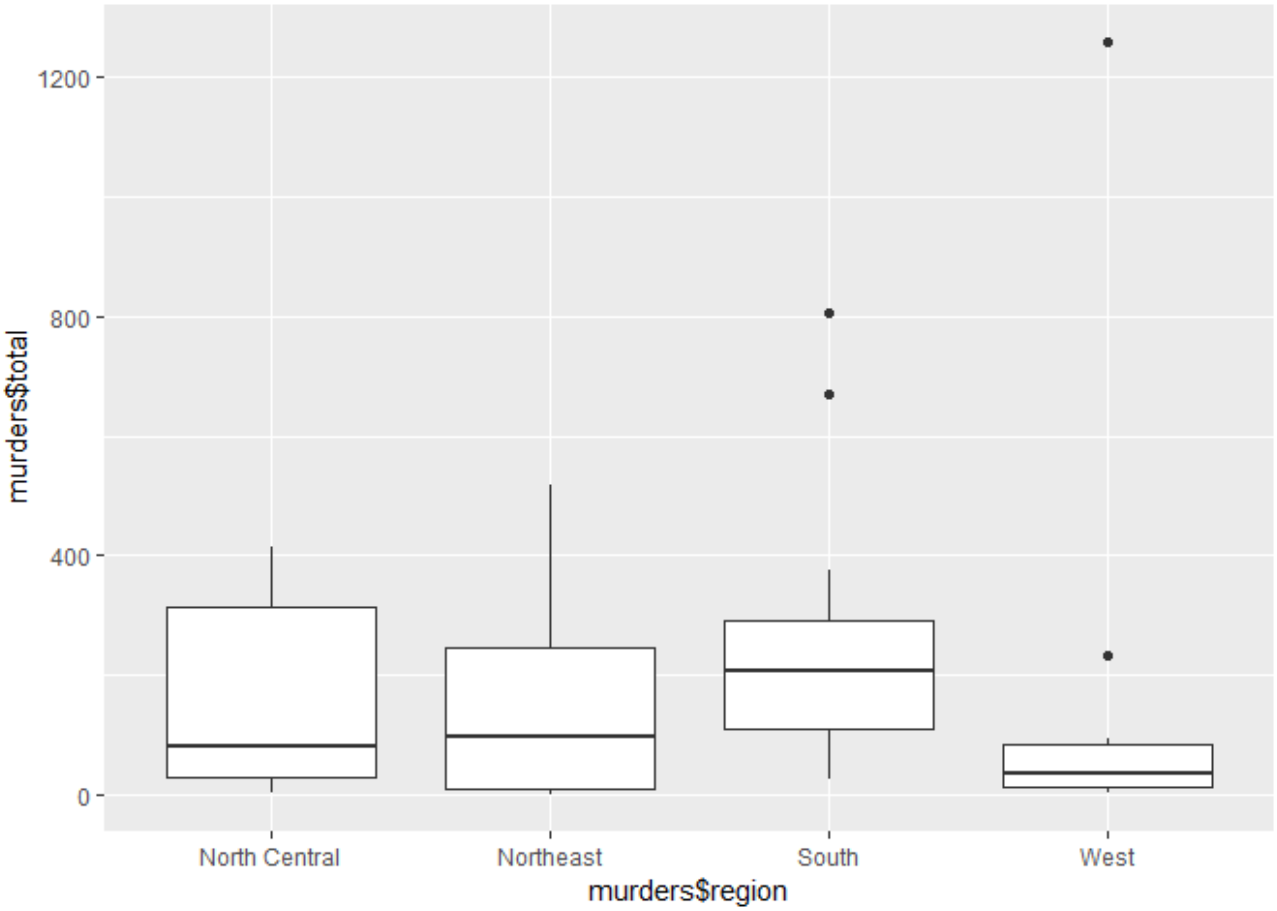
```
murders %>% arrange(desc(rate)) %>% top_n(10)
```

```
## Selecting by rate
```

```
## # A tibble: 10 x 6
##    state                abb   region        population total  rate
##    <chr>                <chr> <fct>              <dbl> <dbl> <dbl>
##  1 District of Columbia DC    South             601723    99 16.5
##  2 Louisiana            LA    South            4533372   351  7.74
##  3 Missouri             MO    North Central    5988927   321  5.36
##  4 Maryland             MD    South            5773552   293  5.07
##  5 South Carolina       SC    South            4625364   207  4.48
##  6 Delaware             DE    South             897934    38  4.23
##  7 Michigan             MI    North Central    9883640   413  4.18
##  8 Mississippi          MS    South            2967297   120  4.04
##  9 Georgia              GA    South            9920000   376  3.79
## 10 Arizona              AZ    West             6392017   232  3.63
```

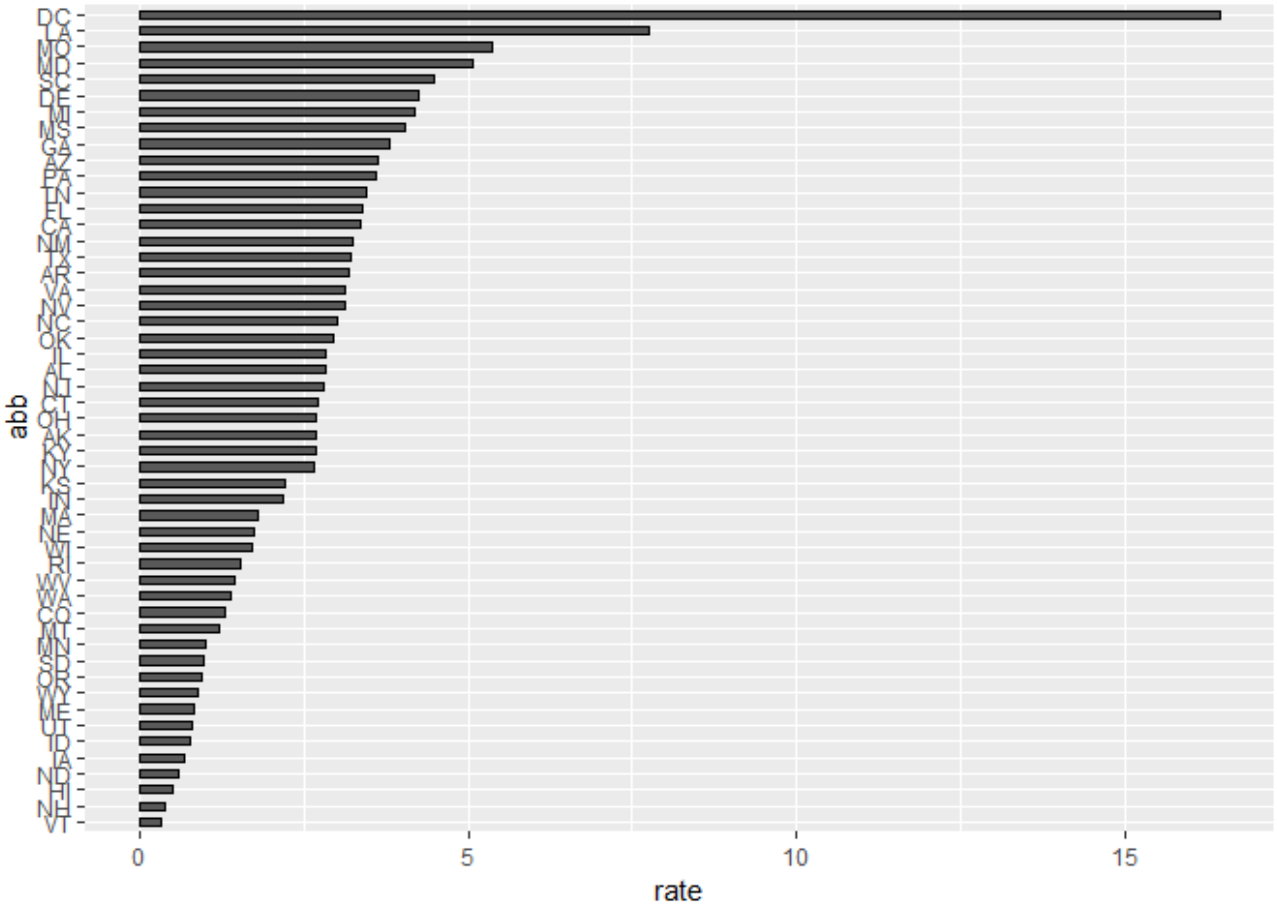
Murder rate across region

```
qplot(murders$region, murders$total, geom = "boxplot")
```



Murder rate across states

```
murders %>% mutate(abb = reorder(abb, rate)) %>%   ggplot(aes(abb, rate)) +
  geom_bar(width = 0.5, stat = "identity", color = "black") +   coord_flip()
```



US Gun murder 2010 in log scale

```
murders %>% ggplot(aes(population/10^6, total, label = abb)) +
  geom_text(nudge_x = 0.05) +    scale_x_log10() +   scale_y_log10() +
  xlab("Populations in millions (log scale)") +    ylab("Total number of murders (log
  ggtitle("US Gun Murders in 2010") + geom_point(size = 3, color ="red")
```

US Gun Murders in 2010