HW5_Tayin

Tayin Wang

due on 2025_12_03

Select one of the following two figures to create for the homework:

Choice 1: Pick one city in the data. Create a map showing the locations of the homicides in that city, using the sf framework discussed in class. Use tigris to download boundaries for some sub-city geography (e.g., tracts, block groups, county subdivisions) to show as a layer underneath the points showing homicides. Use different facets for solved versus unsolved homicides and different colors to show the three race groups with the highest number of homicides for that city (you may find the fct_lump function from forcats useful for this).

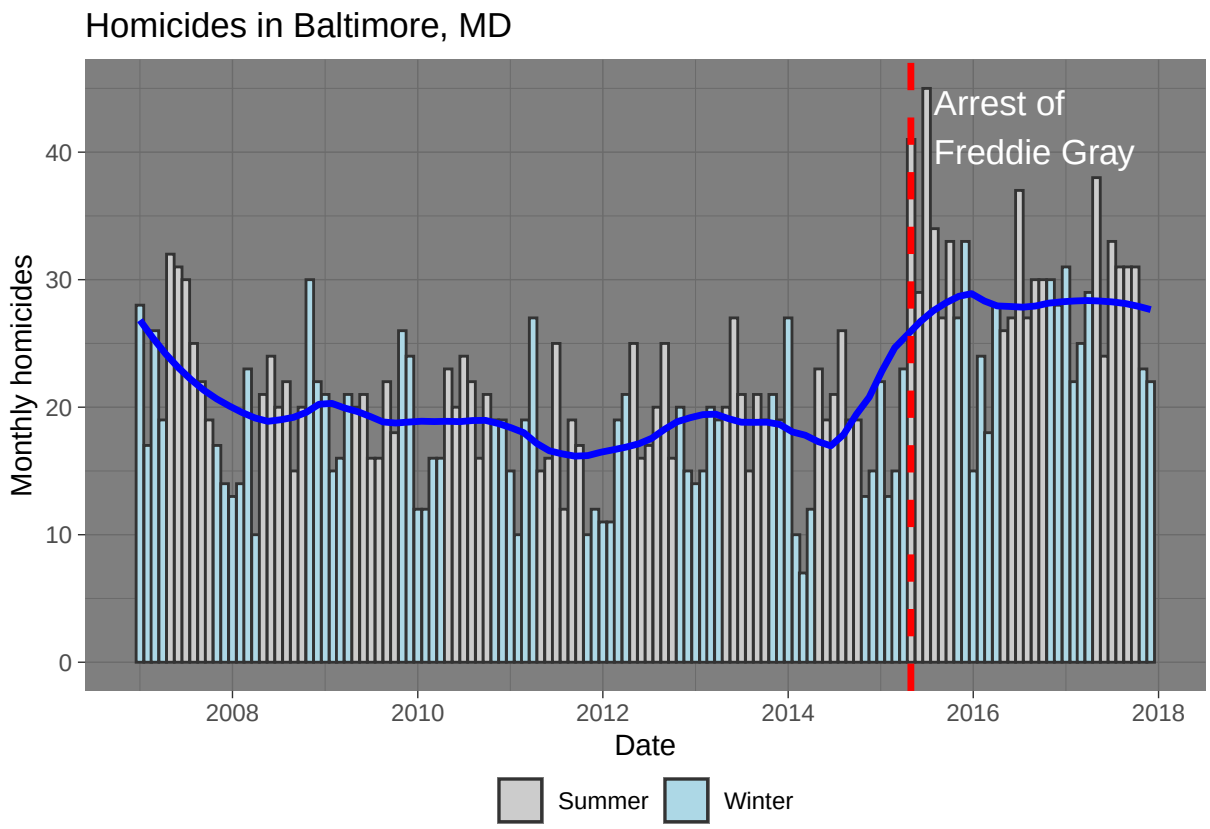
Choice 2: Recreate the graph shown below. It shows monthly homicides in Baltimore, with a reference added for the date of the arrest of Freddie Gray and color used to show colder months (November through April) versus warmer months (May through October). There is a smooth line added to help show seasonal and long-term trends in this data.

```
library(tidyverse)
library(lubridate)

# load file
homicides <- read_csv("/Users/tayinsmac/ERHS535_R programming/Homework/HW5/HW5_TayinWang/Data/homicide-

head(homicides)
```

```
## # A tibble: 6 x 12
##   uid   reported_date victim_last victim_first victim_race victim_age victim_sex
##   <chr>         <dbl> <chr>       <chr>        <chr>       <chr>      <chr>
## 1 Alb-~      20100504 GARCIA      JUAN         Hispanic    78         Male
## 2 Alb-~      20100216 MONTOYA     CAMERON      Hispanic    17         Male
## 3 Alb-~      20100601 SATTERFIELD VIVIANA      White       15         Female
## 4 Alb-~      20100101 MENDIOLA    CARLOS       Hispanic    32         Male
## 5 Alb-~      20100102 MULA        VIVIAN       White       72         Female
## 6 Alb-~      20100126 BOOK        GERALDINE    White       91         Female
## # i 5 more variables: city <chr>, state <chr>, lat <dbl>, lon <dbl>,
## #   disposition <chr>
```

```
# rearrange data
homicides <- homicides %>%
  filter(city == "Baltimore" & state == "MD") %>%
  mutate(Date = ymd(reported_date), #mutate to right date format
         Month = month(Date),
         Year = year(Date),
         Season = ifelse(Month %in% c(11,12,1,2,3,4), "Winter","Summer")
         # Define seasons: Winter = Nov-Apr, Summer = May-Oct ^^
```

```
        )

# summarizing monthly homicides
monthly_homicides <- homicides %>%
count(Year, Month, Season, name = "Homicides") %>%
mutate(Date = ymd(paste(Year, Month, "1", sep = "-")))

# arrest day of Freddie Gray
freddie_gray_date <- ymd("2015-04-30")


# create plot
Freddie_plot <- ggplot(monthly_homicides, aes(x = Date,y = Homicides)) +
    geom_col(aes(fill = Season), color = "gray20", width = 30) +
    scale_fill_manual(values = c("Summer" = "gray80", "Winter" = "lightblue")) +

# smooth line to show seasonal + long-term trend
  geom_smooth(aes(group = 1), method = "loess", span = 0.3, se = FALSE, size = 1.2, color = "blue") +

# Add vertical dashed line for Freddie Gray arrest
  geom_vline(xintercept = freddie_gray_date,
             linetype = "dashed",
             color = "red",
             size = 1.2) +

# text annotation
  annotate("text",
           x = freddie_gray_date + months(3),
           y = 42,
           label = "Arrest of\nFreddie Gray", color = "white",
           size = 4.5,
           hjust = 0) +



# add Labels
  labs( title = "Homicides in Baltimore, MD",
        x = "Date",
        y = "Monthly homicides",
        fill = "") +
  theme_dark() +
  theme(
    legend.position = "bottom",
    legend.box = "vertical",
    legend.margin = margin(t = -5),
    legend.title = element_blank(),
    plot.margin = margin(10, 10, 10, 10))

Freddie_plot
```


Homicides in Baltimore, MD
Arrest of
Freddie Gray
Monthly homicides
0
10
20
30
40
2008
2010
2012
2014
2016
2018
Date
Summer
Winter