Homework #5

Yuting Deng

2024-11-11

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).

```
homicides <- read_csv(paste0("https://raw.githubusercontent.com/washingtonpost/",
                             "data-homicides/refs/heads/master/homicide-data.csv"))
```

```
## Rows: 52179 Columns: 12
## -- Column specification ---------------------------------------------------------
## Delimiter: ","
## chr (9): uid, victim_last, victim_first, victim_race, victim_age, victim_sex...
## dbl (3): reported_date, lat, lon
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
# correct a mistake in the dataset
homicides = homicides %>%
  mutate(state = case_when(
    (city == "Tulsa" & state == "AL") ~ "OK",
    TRUE ~ state
  )) %>%
  mutate(city_name = paste0(city, ", ", state))

head(homicides)
```

```
## # A tibble: 6 x 13
##   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 6 more variables: city <chr>, state <chr>, lat <dbl>, lon <dbl>,
## #   disposition <chr>, city_name <chr>
```

```r
options(tigris_use_cache = TRUE)
options(tigris_class = "sf")
#co_counties <- counties(state = "CO", cb = TRUE, class = "sf")
denver_tracts <- tracts(state = "CO", county = "Denver", year = 2024)
# denver_block_groups <- block_groups(state = "CO", county = "Denver", year = 2024)
# denver_subdivisions <- county_subdivisions(state = "CO", county = "Denver", year = 2024)

ggplot() +
  geom_sf(data = denver_tracts) +
  ggtitle("Denver, CO")
```
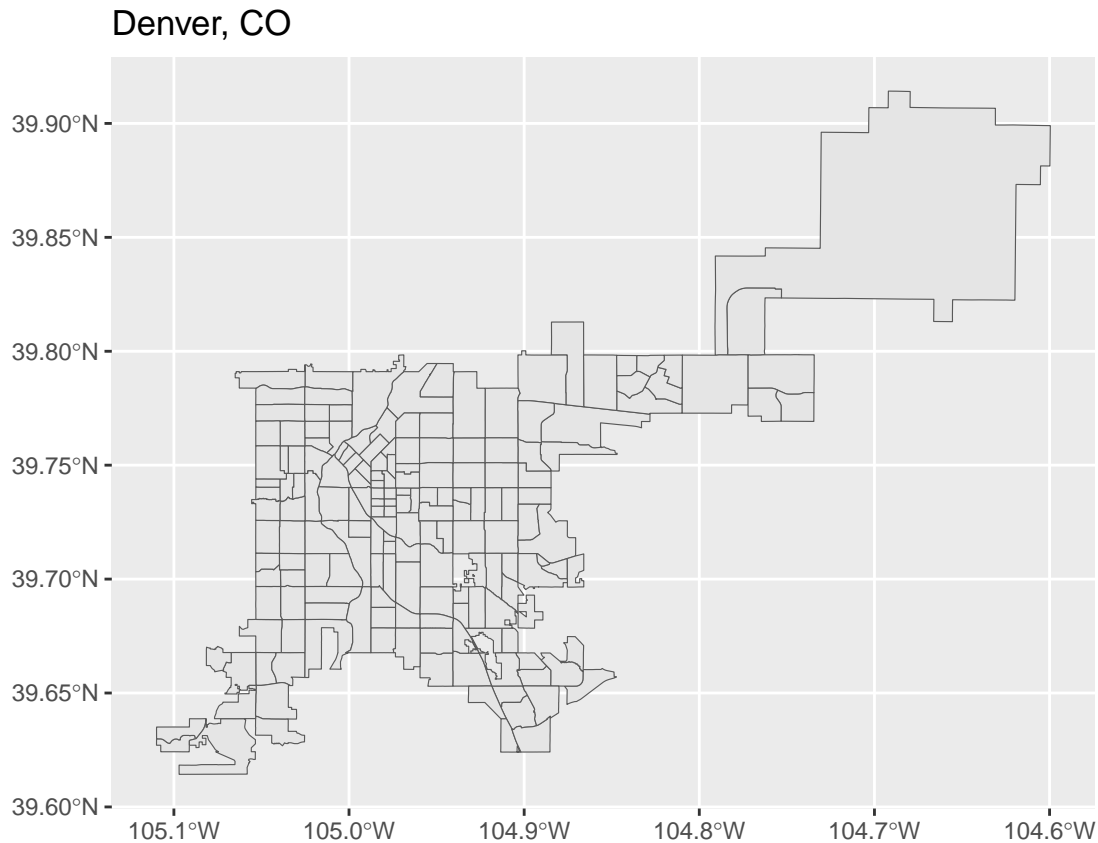

Denver, CO

```r
denver_homicides <- homicides %>%
  filter(city == "Denver") %>%
  mutate(solved = case_when(
    (disposition == "Closed by arrest") ~ "solved",
    (disposition == "Closed without arrest" |
    disposition == "Open/No arrest") ~ "unsolved"
  ))
```

```r
denver_homicides <- denver_homicides %>%
  mutate(
    victim_race_grouped = fct_lump_n(victim_race, n = 3)  # Keep the top 3 races
  )
```

```
denver_homicides_sf <- st_as_sf(denver_homicides, coords = c("lon", "lat")) %>%
  st_set_crs(4326)
```

```
ggplot() +
  geom_sf(data = denver_tracts) +
  geom_sf(data = denver_homicides_sf, aes(color = victim_race_grouped)) +
  ggtitle("Denver Homicide Cases")+
  facet_wrap(~solved, nrow = 2)+
  labs(color = "Victim race")+
  theme_light()
```

Denver Homicide Cases