Project_Writeup

Data Nexus

Public Safety Awareness Campaign Based on Crime Data

Overview

This project aims to develop a comprehensive public safety awareness campaign that utilizes detailed crime data from Los Angeles, spanning from 2020 to the present. The focus is on enhancing community well-being by educating residents about prevalent crime types, identifying high-risk areas, and promoting proactive safety measures.

Objective

To analyze crime data to inform a public safety campaign that:

- Educates the Los Angeles community about common crime trends.
- Identifies and addresses high-risk areas effectively.
- Encourages the adoption of proactive safety measures.

Project Description

This initiative will leverage crime data provided by the LAPD to dissect crime patterns and distributions geographically and temporally. The resulting insights will guide the creation of targeted awareness content, aiming to equip residents with the knowledge and tools to enhance their safety and foster a cooperative relationship between the LAPD and the community.

Data Source

- **Source:** LAPD Crime Dataset from the Los Angeles Open Data Portal.

  Link: https://catalog.data.gov/dataset/crime-data-from-2020-to-present
- **Coverage:** 2020 to present, with bi-weekly updates following a recent system transition to NIBRS compliance in March 2024.
- **Content:** The dataset comprises approximately 984,000 records, each representing a crime incident detailed across 28 fields including incident specifics, victim demographics, location data, and case status.

Data Analysis Strategy

1. **Initial Data Handling:**
   - Load and merge data from multiple CSV files.
   - Perform cleaning and preprocessing to ensure data integrity and usability.
2. **Exploratory Analysis:**
   - Identify the most frequent crime types and affected neighborhoods.
   - Analyze demographic factors influencing crime rates to tailor the campaign messaging.
3. **Detailed Analysis:**
   - Investigate temporal patterns to understand crime trends over the years.
   - Spatial analysis to pinpoint high-risk locations and peak times for crimes.

```r
#Code and Visualization for the total cases reported:
#Load necessary libraries
library(ggplot2)
```

```
Warning: package 'ggplot2' was built under R version 4.4.2
```

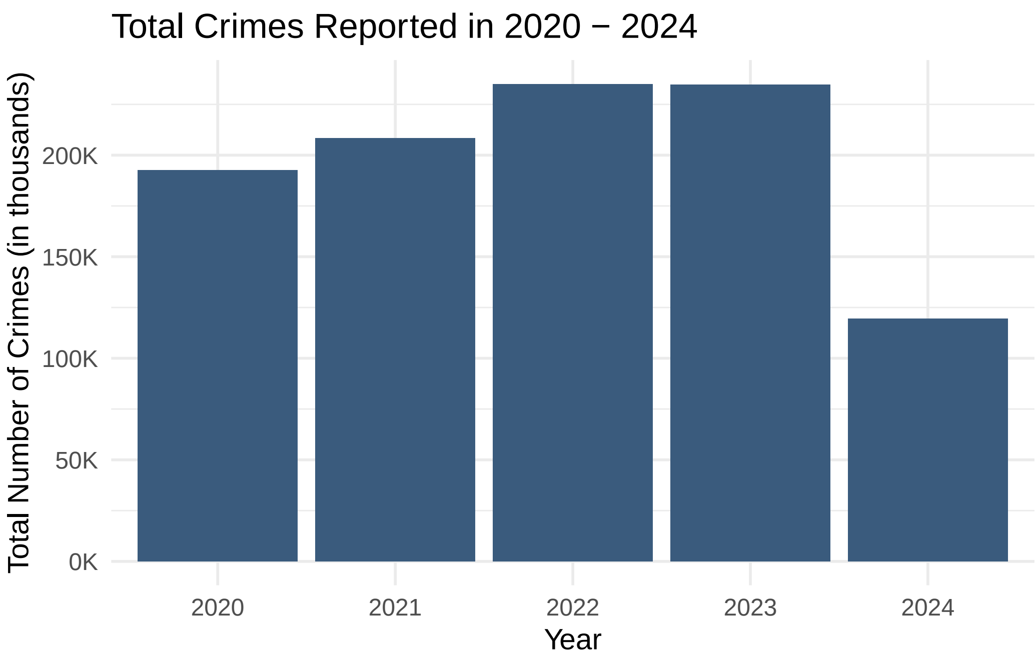
```r
library(RColorBrewer)
library(dplyr)
```

```
Warning: package 'dplyr' was built under R version 4.4.2
```

```
Attaching package: 'dplyr'


The following objects are masked from 'package:stats':

    filter, lag


The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union
```

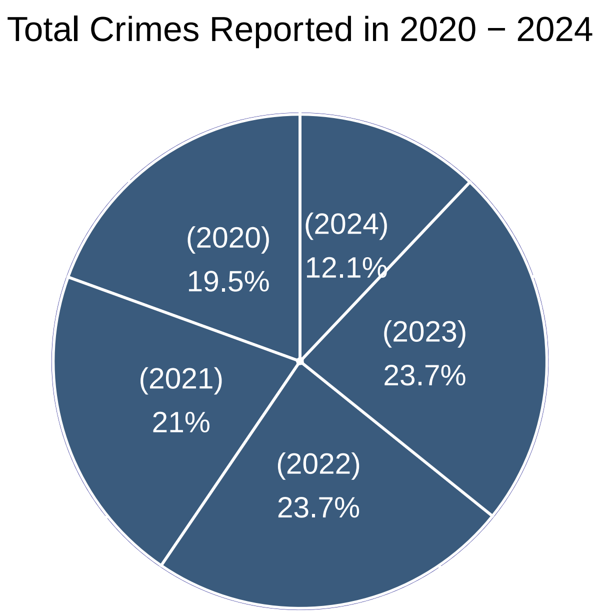
```r
library(scales)

# Load the data
# Read the dataset
csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
crime_data <- do.call(rbind, lapply(csv_files, read.csv))

# Summarize the total number of crimes for the year 2020
crime_summary <- crime_data %>%
  group_by(Year) %>%
  summarize(Total_Crimes = n())

# Calculate percentages for the pie chart
crime_summary <- crime_summary %>%
mutate(Percentage = Total_Crimes / sum(Total_Crimes) * 100)

# Define a single-color palette (blue)
color_palette <- c("#3A5B7D")  # Replace with your preferred shade of blue

# Bar Graph: Total Crimes Reported in 2020
ggplot(crime_summary, aes(x = factor(Year), y = Total_Crimes, fill = factor(Year ))) +
  geom_bar(stat = "identity") +
  scale_y_continuous(labels = label_number(scale = 0.001, suffix = "K")) +
  # Adjust y-axis labels
  scale_fill_manual(values = rep(color_palette, length(unique(crime_summary$Year)))) +
  labs(
    title = "Total Crimes Reported in 2020 - 2024",
    x = "Year",
    y = "Total Number of Crimes (in thousands)"
  ) +
```

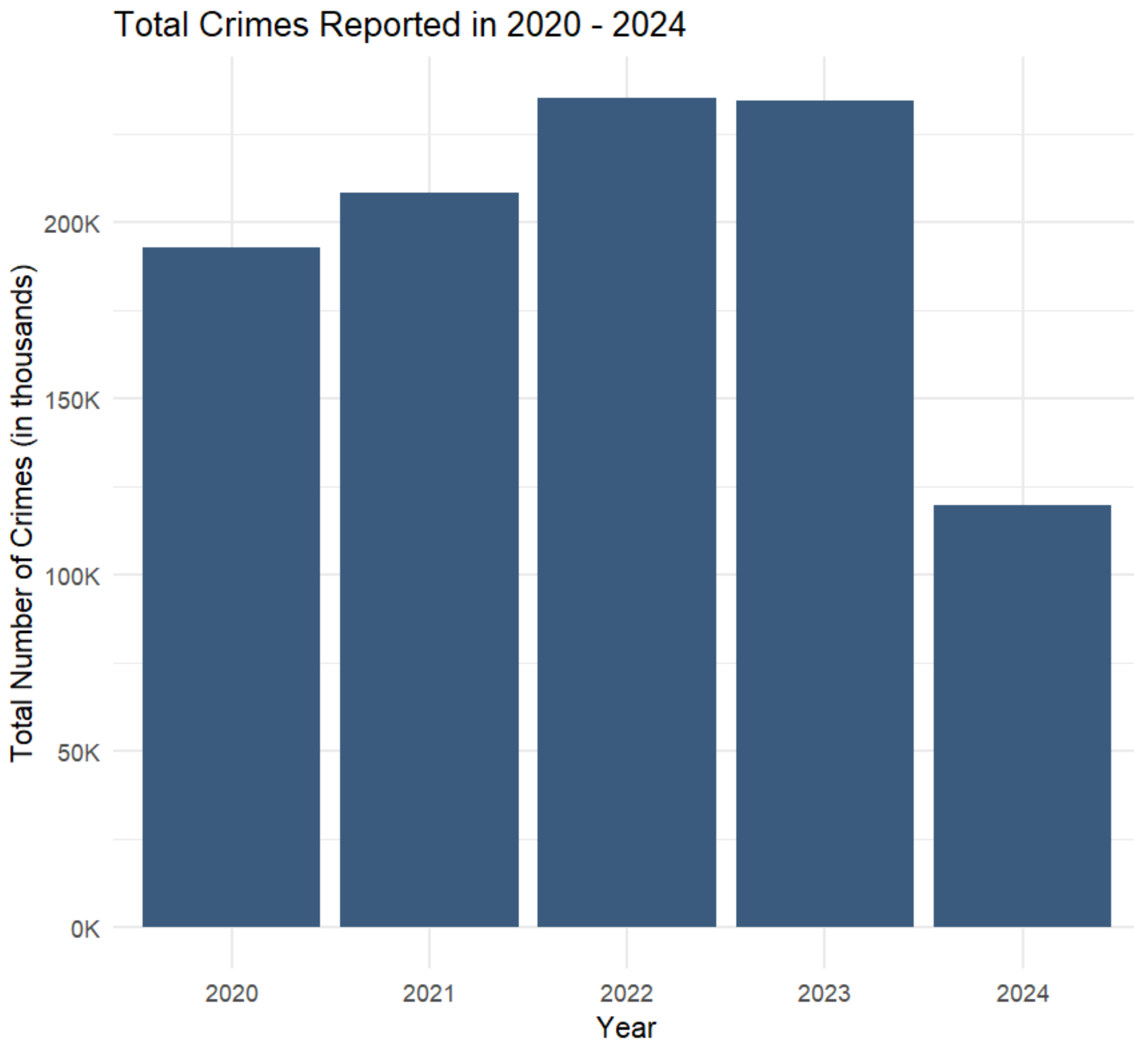
```
  theme_minimal() +
  theme(legend.position = "none")  # Hide legend
```

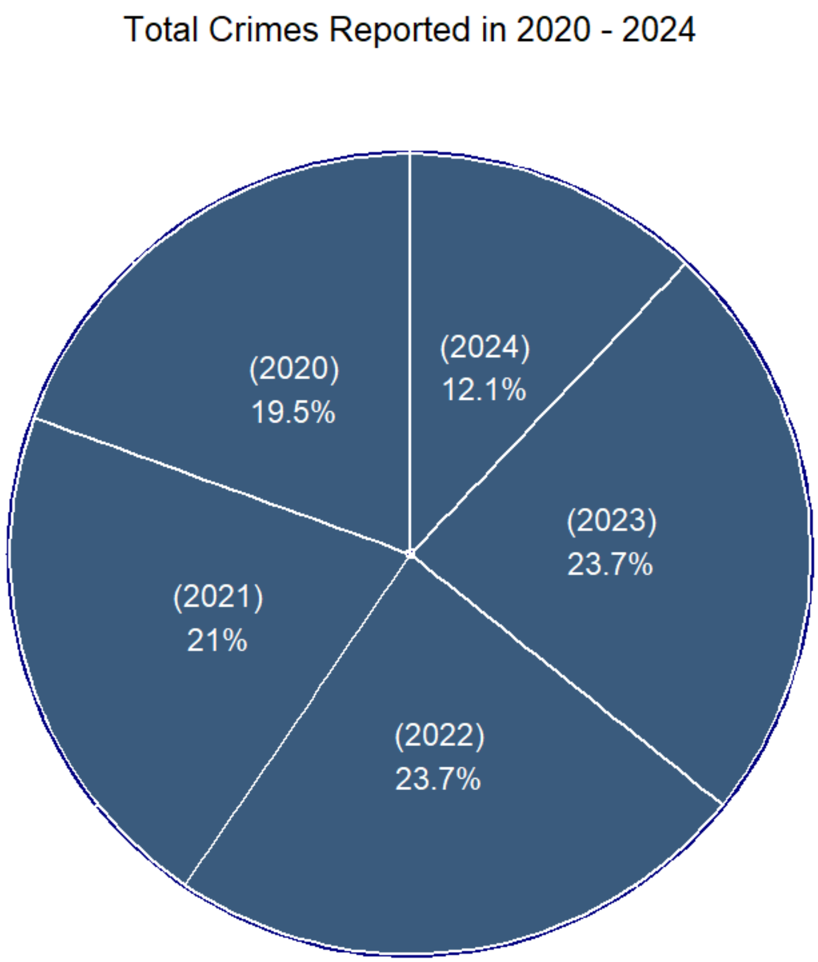



```
# Define a custom color palette with lighter and darker shades for depth
color_palette <- c("#000080", "#3A5B7D")  # Blue and dark blue for shading effect

# Pie Chart: Total Crimes Reported in 2020 with Depth
ggplot(crime_summary, aes(x = "", y = Total_Crimes, fill = factor(Year))) +
  geom_bar(stat = "identity", width = 1.2, color = "white", show.legend = FALSE, fill = colo
  geom_bar(stat = "identity", width = 1.17, color = "white", aes(fill = factor(Year))) +
  # Inner layer for "depth"
  coord_polar("y") +
  geom_text(aes(label = paste0("(", Year, ")", "\n", round(Percentage, 1), "%")),
            position = position_stack(vjust = 0.5),
            color = "white", size = 4) +
  scale_fill_manual(values = rep(color_palette[2], length(unique(crime_summary$Year)))) +
  labs(
    title = "Total Crimes Reported in 2020 - 2024"
  ) +
  theme_void() +
  theme(
    plot.title = element_text(hjust = 0.5),
```

```
    legend.position = "none"  # Hide legend
  )
```




Total Crimes Reported in 2020 - 2024
Total Number of Crimes (in thousands)
200K
150K
100K
50K
0K
2020
2021
2022
2023
2024
Year



Key Research Questions

1. **What are the primary types of crimes occurring in Los Angeles and their distribution across the city?**

   Understanding the primary types of crimes and their geographic distribution is critical to improving public safety and allocating resources effectively. By analyzing crime data, this research will identify prevalent crime categories (such as violent crimes, property crimes, and drug-related offenses) and the specific neighborhoods or regions most affected by these crimes. This insight helps to pinpoint where targeted interventions and public awareness campaigns are most needed.

- **Approach:**
  - **Data Categorization**
    * Classify crimes into high-level categories (e.g., assault, theft, burglary, drug offenses, vandalism).
    * Use data fields such as crime type, crime code, and description for consistent classification.
  - **Geospatial Analysis:**
    * Map the distribution of crimes using GIS (Geographic Information Systems) tools to visualize crime hotspots.
    * Use heatmaps and kernel density estimation to highlight areas with high concentrations of crime.
  - **Temporal Analysis:**
    * Analyze trends over time (monthly, quarterly, yearly) to observe patterns in crime rates.
    * Identify seasonal variations (e.g., spikes during holidays or specific events).
  - **Statistical Methods:**
    * Apply clustering techniques like **K-Means** or **DBSCAN** to group locations based on crime frequency and type.
    * Use regression analysis to identify factors contributing to crime rates in specific areas.
  - **Visualization:**
    * Develop interactive maps and dashboards showing crime types, hotspots, and temporal trends.
    * Create infographics that can be shared via social media and community meetings.
  - **Insights for the Campaign:**
    * Identify which neighborhoods require increased police presence or community engagement.
    * Create location-specific materials (e.g., safety flyers for high-theft areas) and share information about peak crime hours.

```r
#   The code and visualization for the Area with top 5 Crimes:
# Load necessary libraries
library(sf)
```

```
Warning: package 'sf' was built under R version 4.4.2
```

```
Linking to GEOS 3.12.2, GDAL 3.9.3, PROJ 9.4.1; sf_use_s2() is TRUE
```

```r
library(tigris)
```

```
Warning: package 'tigris' was built under R version 4.4.2

To enable caching of data, set `options(tigris_use_cache = TRUE)`
in your R script or .Rprofile.
```

```r
library(ggplot2)
library(dplyr)
library(stringr) # For string manipulation
library(readr) # For reading CSV files
```

```

Attaching package: 'readr'

The following object is masked from 'package:scales':

    col_factor
```

```r
library(tmap)
```

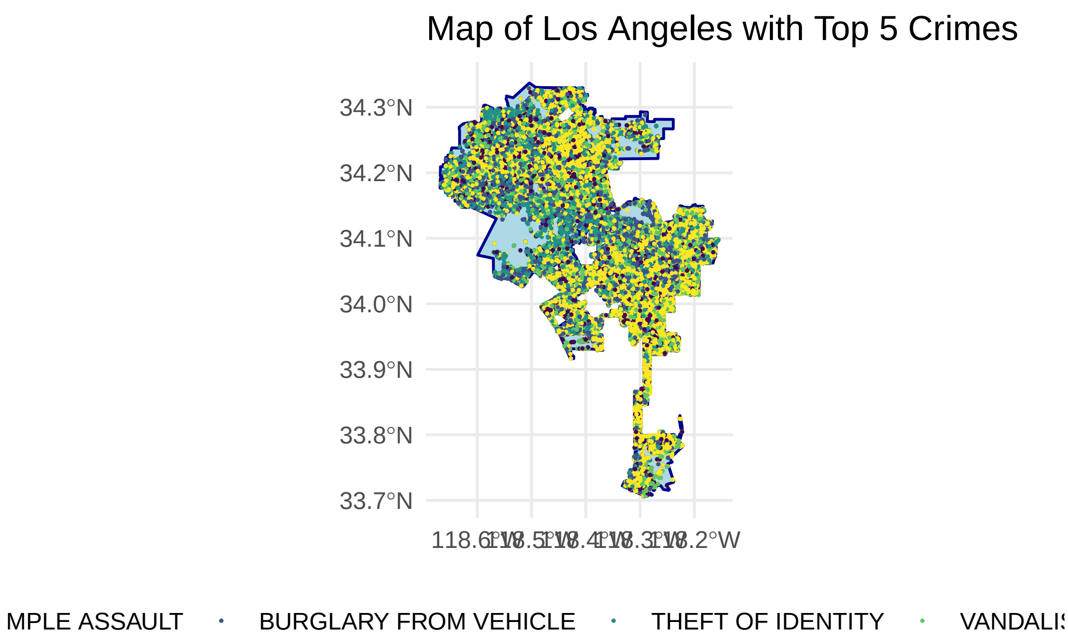
```
Warning: package 'tmap' was built under R version 4.4.2

Breaking News: tmap 3.x is retiring. Please test v4, e.g. with
remotes::install_github('r-tmap/tmap')
```

```r
# Set options for tigris
options(tigris_class = "sf", tigris_use_cache = TRUE)

# Step 1: Fetch Los Angeles city shapefile
la_shapefile <- places(state = "CA", cb = TRUE) %>%
  filter(NAME == "Los Angeles")
```

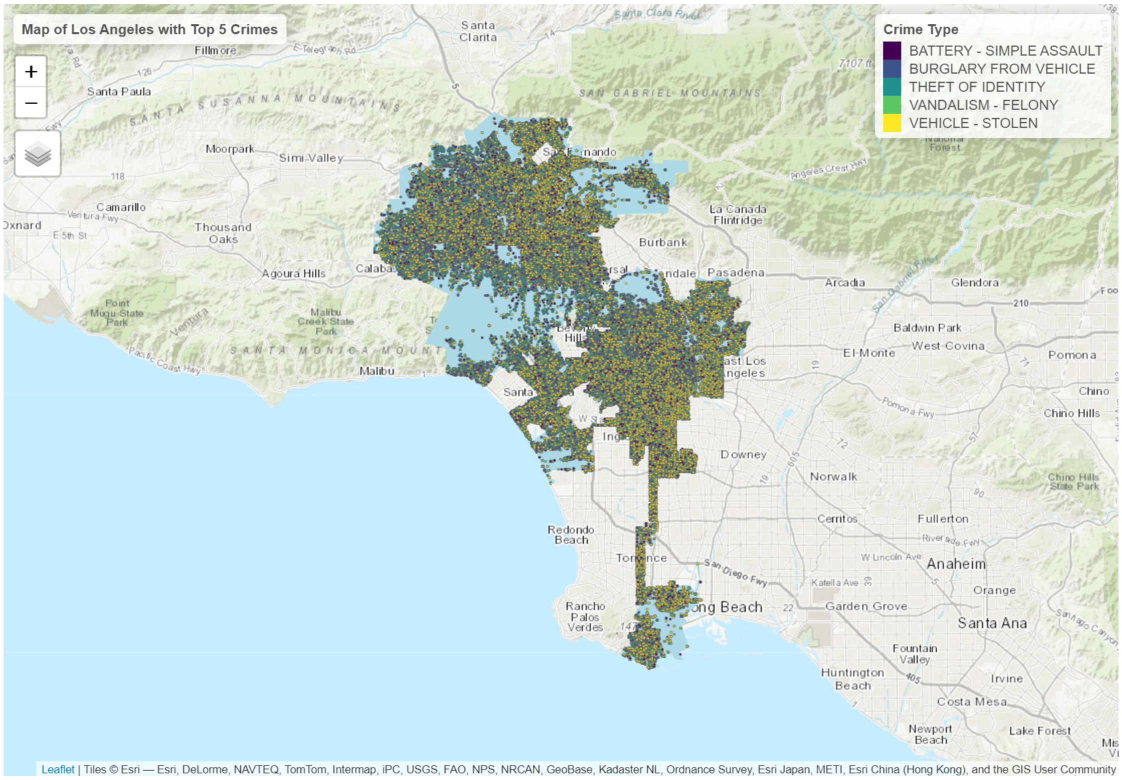
```
Retrieving data for the year 2022
```

```r
# Step 2: Read and combine all CSV files into one data frame
csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
csv_data <- do.call(rbind, lapply(csv_files, read.csv))

# Step 3: Replace specific value in "Crm Cd Desc"
csv_data <- csv_data %>%
  mutate(Crm.Cd.Desc = str_replace(
    Crm.Cd.Desc,
    "VANDALISM - FELONY \\(\\$400 & OVER, ALL CHURCH VANDALISMS\\)",
```

```r
    "VANDALISM - FELONY"
  ))

# Step 4: Filter out rows where LON and LAT are 0
filtered_data <- csv_data %>%
  filter(LON != 0, LAT != 0)

# Step 5: Identify top 5 crimes in "Crm Cd Desc"
top_crimes <- filtered_data %>%
  count(Crm.Cd.Desc, sort = TRUE) %>%
  top_n(5, n) %>%
  pull(Crm.Cd.Desc)

# Step 6: Filter data for only the top 5 crimes
filtered_top_crimes <- filtered_data %>%
  filter(Crm.Cd.Desc %in% top_crimes)

# Step 7: Convert filtered data to an sf object
points_sf <- st_as_sf(filtered_top_crimes, coords = c("LON", "LAT"), crs = 4326)

# Step 8: Transform coordinate system to match Los Angeles shapefile
points_sf <- st_transform(points_sf, st_crs(la_shapefile))

# Step 9: Plot the map with points categorized by crime and legend adjustments
ggplot() +
  geom_sf(data = la_shapefile, fill = "lightblue", color = "darkblue", linewidth = 0.5)
  geom_sf(data = points_sf, aes(color = Crm.Cd.Desc), size = 0.1, alpha = 1) +
  scale_color_viridis_d(name = "Crime Type") +
  ggtitle("Map of Los Angeles with Top 5 Crimes") +
  theme_minimal() +
  theme(
    legend.position = "bottom",        # Move legend to the bottom
    legend.title = element_text(size = 10), # Customize legend title size
    legend.text = element_text(size = 9),   # Customize legend text size
    legend.box = "horizontal"          # Arrange legend horizontally
  )
```

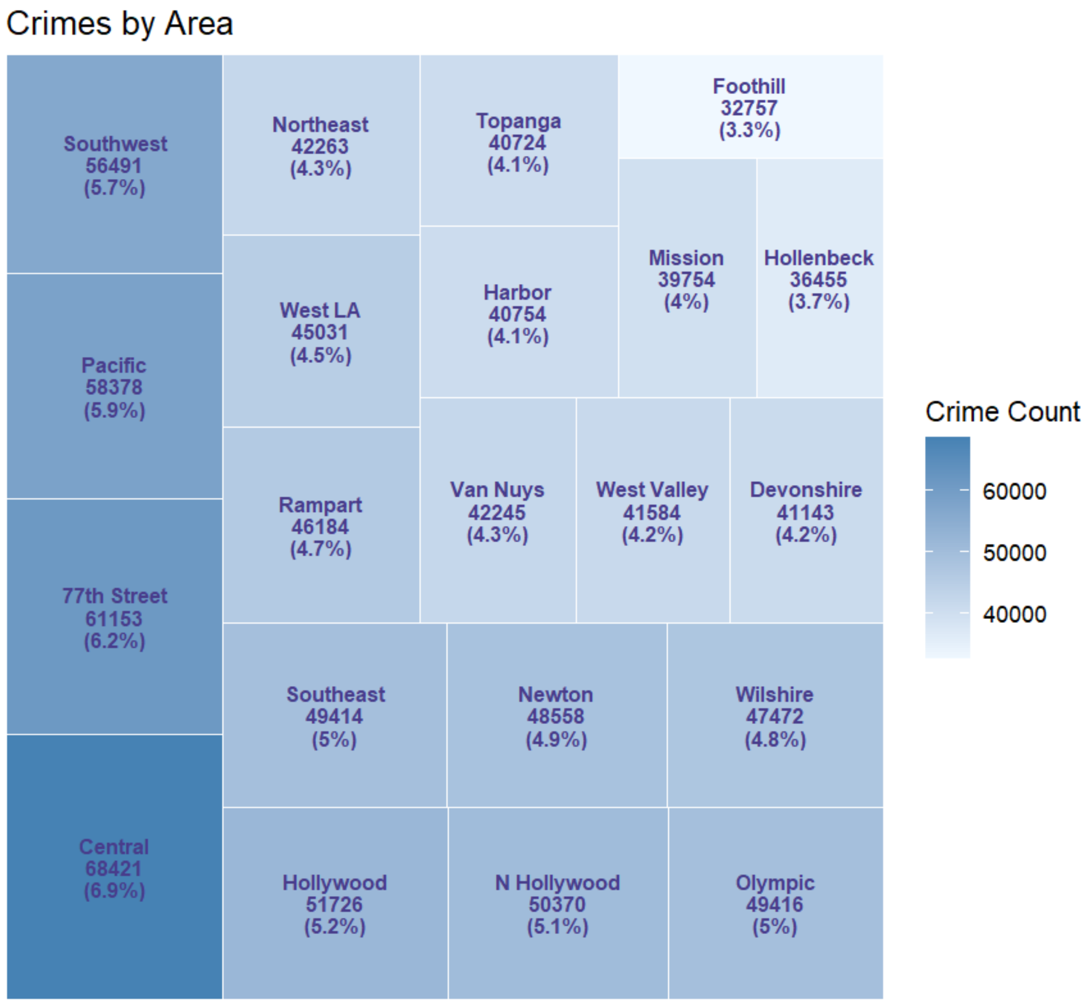



```
# tmap_mode("view")
#
# # Base map with tm_shape and tm_fill
# tm_shape(la_shapefile) +
#   tm_fill(col = "lightblue", border.col = "darkblue", border.lwd = 0.5) + # Fill and b
#   tm_shape(points_sf) +
#   tm_dots(
#     col = "Crm.Cd.Desc",
#     palette = "viridis",
#     size = 0.001,
#     alpha = 1,
#     title = "Crime Type" # Legend title
#   ) +
#   tm_layout(
#     title = "Map of Los Angeles with Top 5 Crimes",
#     legend.outside = FALSE,              # Keep legend inside the map
#     legend.position = c("bottom"),       # Place legend at the bottom
#     legend.text.size = 0.9,              # Adjust legend text size
#     legend.title.size = 1.0,             # Adjust legend title size
#     legend.bg.color = "white",           # Background color for legend
#     legend.bg.alpha = 0.8                # Slight transparency for legend background
#   )
```




```
#Code and Visualization for the areas in a TreeMap to define the count, #percentage and

#install.packages("treemapify")

# Load necessary libraries
#library(ggplot2)
#library(dplyr)
#library(treemapify)

# Read the dataset
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#crime_data <- do.call(rbind, lapply(csv_files, read.csv))

# Summarize crimes by area and sort in descending order
#area_summary <- crime_data %>%
#  group_by(AREA.NAME) %>%
#  summarize(Crime_Count = n(), .groups = "drop") %>%
#  mutate(Percentage = Crime_Count / sum(Crime_Count) * 100) %>%
#  arrange(desc(Crime_Count))
```

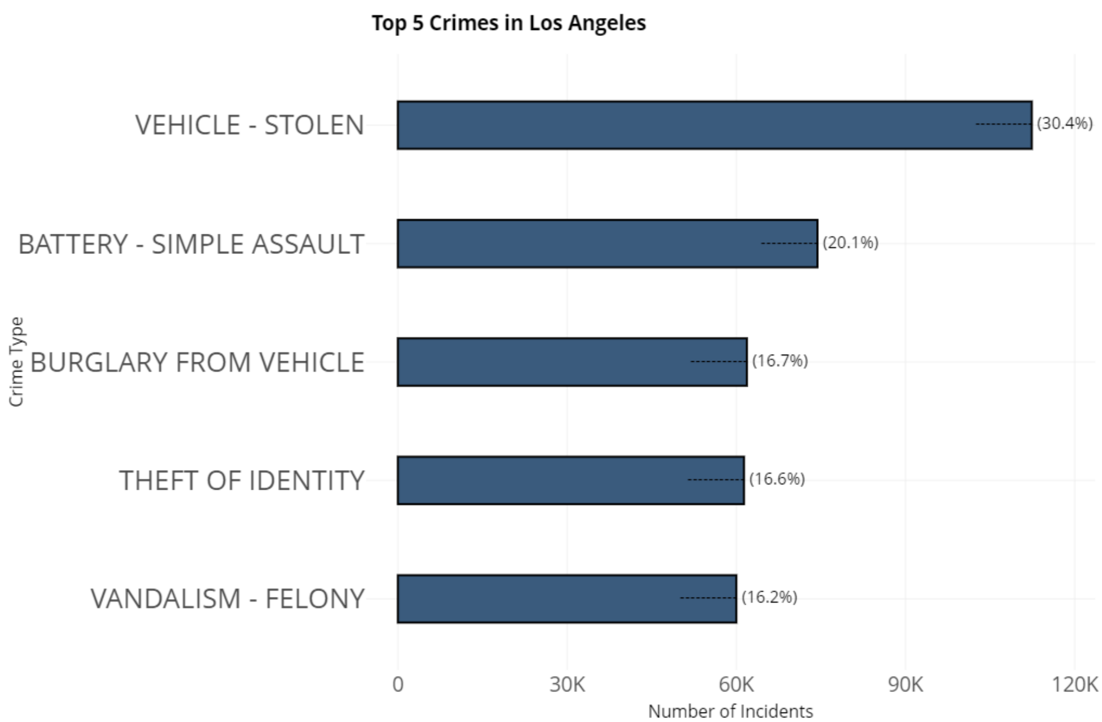
```
# Determine text color based on Crime_Count (higher values: white, lower values: black)
#area_summary <- area_summary %>%
#  mutate(Text_Color = ifelse(Crime_Count > median(Crime_Count), "white", "black"))

# Create a treemap with sorted data and conditional text color
#ggplot(area_summary, aes(
#  area = Crime_Count,
#  fill = Crime_Count,
#  label = paste0(AREA.NAME, "\n", Crime_Count, "\n", "(", round(Percentage, 1), "%)")
#)) +
#  geom_treemap(color = "white") +  # Set line color to white
#  geom_treemap_text(
#    aes(colour = "darkslateblue"),
#    fontface = "bold",
#    place = "centre",
#    grow = FALSE,  # Disable font resizing
#    size = 8      # Set a consistent font size
#  ) +
#  scale_colour_identity() +  # Use text color as specified in the data
#  scale_fill_gradient(low = "aliceblue", high = "steelblue") +
#  labs(
#    title = "Crimes by Area",
#    fill = "Crime Count"
#  ) +
#  theme_minimal()
```




```
#Code and Visualization of top 5 Crimes:

# Load necessary libraries
#library(sf)
#library(tigris)
#library(ggplot2)
#library(dplyr)
#library(stringr) # For string manipulation
#library(readr) # For reading CSV files
#library(plotly) # For interactive plots
#library(scales) # For number formatting

# Set options for tigris
#options(tigris_class = "sf", tigris_use_cache = TRUE)
```

```
# Step 1: Read and combine all CSV files into one data frame
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#csv_data <- do.call(rbind, lapply(csv_files, read.csv))

# Step 2: Replace specific value in "Crm Cd Desc"
#csv_data <- csv_data %>%
#  mutate(Crm.Cd.Desc = str_replace(
#    Crm.Cd.Desc,
#    "VANDALISM - FELONY \\(\\$400 & OVER, ALL CHURCH VANDALISMS\\)",
#    "VANDALISM - FELONY"
#  ))

# Step 3: Filter out rows where LON and LAT are 0
#filtered_data <- csv_data %>%
#  filter(LON != 0, LAT != 0)

# Step 4: Identify top 5 crimes in "Crm Cd Desc"
#top_crimes <- filtered_data %>%
#  count(Crm.Cd.Desc, sort = TRUE) %>%
#  top_n(5, n) %>%
#  mutate(Percentage = n / sum(n) * 100) # Calculate percentage of each crime

# Step 5: Create an interactive bar plot for the top 5 crimes
# Modify theme to increase the font size of x-axis labels
#plot <- ggplot(top_crimes, aes(x = reorder(Crm.Cd.Desc, n), y = n,
#                                text = paste("Crime Type:", Crm.Cd.Desc,
#                                             "<br>Incidents:", n,
#                                             "<br>Percentage:", sprintf("%.1f%%", Percen
#  geom_bar(stat = "identity", fill = "#3A5B7D", color = "black", width = 0.4) +
#  geom_text(aes(label = paste0(" ----------- (", sprintf("%.1f%%", Percentage), ")")),
#            hjust = 10,
#            size = 4,
#            color = "black",
#            fontface = "bold") +
#  coord_flip() + # Flip coordinates to make horizontal bars
#  scale_y_continuous(labels = label_number(scale_cut = cut_short_scale()),
#                     expand = expansion(mult = c(0.05, 0.1))) + # Format #numbers and a
#  labs(
#    title = "Top 5 Crimes in Los Angeles",
#    x = "Crime Type",
#    y = "Number of Incidents"
#  ) +
```

```
#  theme_minimal() +
#  theme(
#    legend.position = "none",        # Hide legend for this plot
#    plot.title = element_text(size = 14, face = "bold"),
#    axis.title = element_text(size = 12),
    #axis.text.y = element_text(margin = margin(t = 0, r = 5, b = 0, l = 5)), # #Adjust
#    axis.text.y = element_text(size = 19), # Increase font size of y-axis labels
#    axis.text.x = element_text(size = 14), # Increase font size of x-axis labels
#    plot.title.position = "plot"
#  )

# Convert ggplot to an interactive plotly plot
#interactive_plot <- ggplotly(plot, tooltip = "text")

# Print the interactive plot
#interactive_plot
```



2. **How do victim demographics vary across different crime types?**

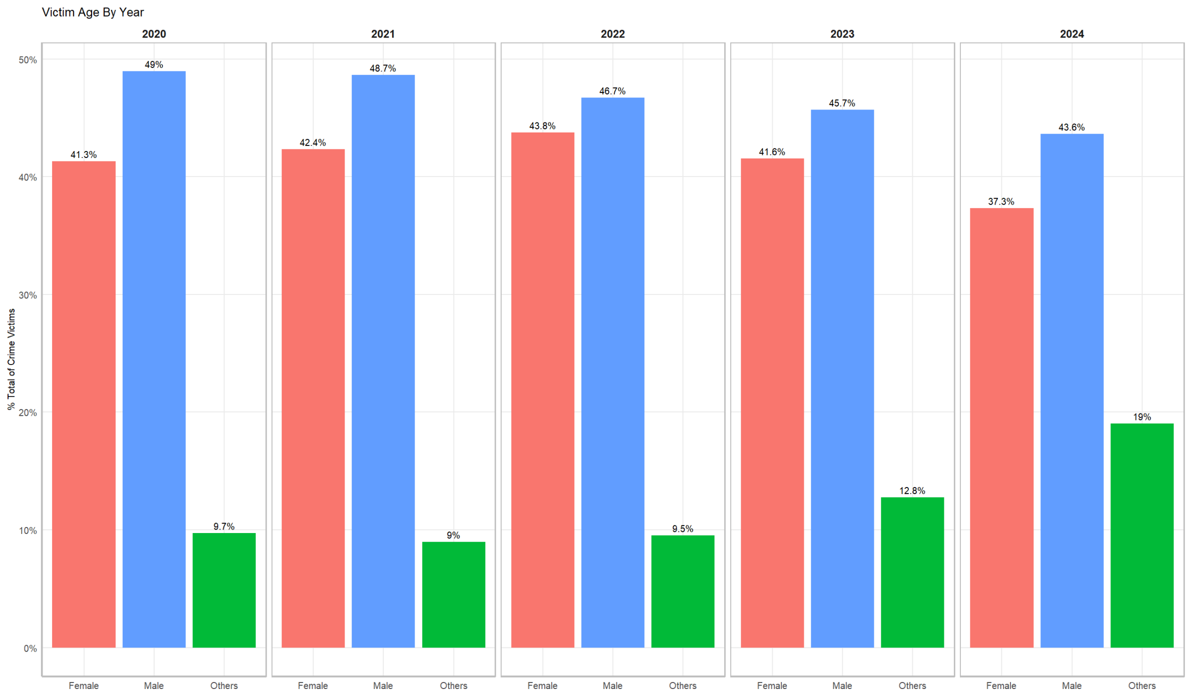
   Analyzing how different demographics (age, sex, and descent) are affected by various crime types can provide valuable insights for tailoring public safety campaigns. This research aims to identify patterns of victimization, such as whether specific age groups or genders are more susceptible to certain crimes. These insights will enable the development of targeted safety messages and community interventions to protect vulnerable populations.

Approach:

- **Data Segmentation:**
  - Segment crime data by victim demographics using fields such as age, sex, and descent.
  - Group demographics into meaningful categories (e.g., age ranges: 0-17, 18-34, 35-54, 55+).
- **Crime Type Association:**
  - Analyze the relationship between demographic segments and crime types.
  - Identify which demographics are more frequently victimized in specific crimes (e.g., young adults in assault cases, elderly individuals in fraud cases).
- **Statistical Analysis:**
  - Perform cross-tabulation and correlation analysis to identify significant patterns.
  - Use hypothesis testing (e.g., chi-square tests) to validate observed trends.
  - Apply machine learning techniques (e.g., decision trees or logistic regression) to predict demographics most at risk for certain crimes.
- **Visualization:**
  - Create demographic distribution charts (e.g., bar graphs, pie charts) highlighting patterns of victimization.
  - Develop heatmaps showing where specific demographic groups are most affected
- **Predictive Insights:**
  - Generate profiles of vulnerable demographics for each crime type to inform safety strategies.
  - Identify whether certain ethnic or gender groups are disproportionately affected by particular crimes.
- **Insights for the Campaign:**
  - Customize safety messages for different demographics (e.g., social media campaigns for young adults, printed flyers for senior citizens).

- Develop culturally relevant materials and outreach programs to address the needs of specific communities.

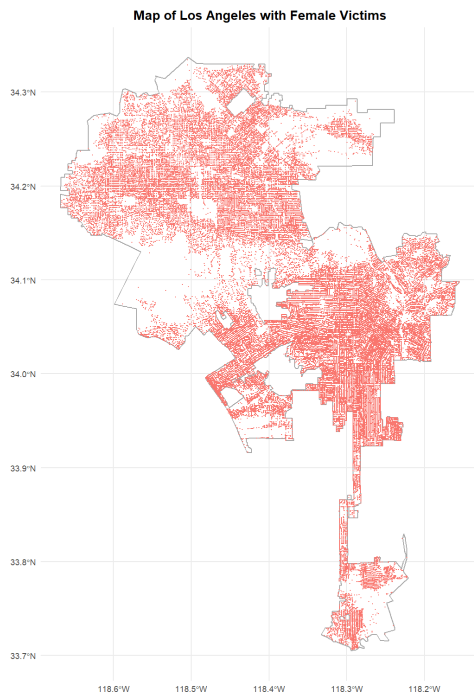
```
#Code and Visualization of Victim Age Distribution:
# Load necessary libraries
#library(sf)
#library(tigris)
#library(ggplot2)
#library(dplyr)
#library(stringr) # For string manipulation
#library(readr) # For reading CSV files

# Step 1: Read and combine all CSV files into one data frame
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#crime_data <- do.call(rbind, lapply(csv_files, read.csv))

#cleaned_data <- subset(crime_data, !is.na(Vict.Age) & Vict.Age != 0)

# Define bin size (e.g., 5 years per bin)
#bin_size <- 5

# Create a histogram for victim age distribution
#ggplot(cleaned_data, aes(x = Vict.Age)) +
#  geom_histogram(binwidth = bin_size, fill = "#3A5B7D", alpha = 0.9, color = "black") +
#  scale_x_continuous(
#    breaks = seq(0, max(cleaned_data$Vict.Age, na.rm = TRUE), by = 20),
#    name = "Age of Victims"
#  ) +
#  scale_y_continuous(
#    labels = function(x) paste0(x / 1000, "K"),
#    name = "Number of Victims (in thousands)"
#  ) +
#  labs(
#    title = "Distribution of Crime Victims by Age"
#  ) +
#  theme_minimal()
```

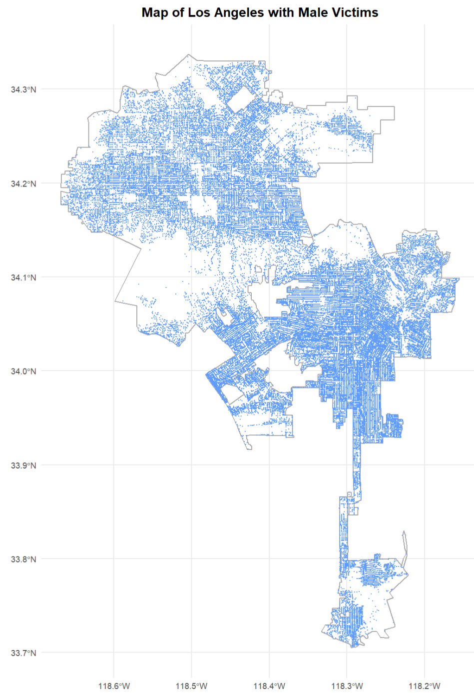



```
#Code and Visualization of Victim Sex (Male & Female) Distribution in Map of Los Angeles:

# Load necessary libraries
#library(sf)
#library(tigris)
#library(ggplot2)
#library(dplyr)
#library(stringr) # For string manipulation
#library(readr) # For reading CSV files
#library(tmap)

# Set options for tigris
#options(tigris_class = "sf", tigris_use_cache = TRUE)

# Step 1: Fetch Los Angeles city shapefile
#la_shapefile <- places(state = "CA", cb = TRUE) %>%
#   filter(NAME == "Los Angeles")

# Step 2: Read and combine all CSV files into one data frame
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#csv_data <- do.call(rbind, lapply(csv_files, read.csv))
```

```
# Step 3: Replace specific value in "Crm Cd Desc"
#csv_data <- csv_data %>%
#  mutate(Crm.Cd.Desc = str_replace(
#    Crm.Cd.Desc,
#    "VANDALISM - FELONY \\(\\$400 & OVER, ALL CHURCH VANDALISMS\\)",
#    "VANDALISM - FELONY"
#  ))

# Step 4: Filter out rows where LON and LAT are 0
#filtered_data <- csv_data %>%
#  filter(LON != 0, LAT != 0, Vict.Sex == 'M')

# Step 5: Identify top 5 crimes in "Crm Cd Desc"
#top_crimes <- filtered_data %>%
#  count(Vict.Sex, sort = TRUE) %>%
#  pull(Vict.Sex)

# Step 6: Filter data for only the top 5 crimes
#filtered_top_crimes <- filtered_data %>%
#  filter(Vict.Sex %in% top_crimes)

# Step 7: Convert filtered data to an sf object
#points_sf <- st_as_sf(filtered_top_crimes, coords = c("LON", "LAT"), crs = 4326)

# Step 8: Transform coordinate system to match Los Angeles shapefile
#points_sf <- st_transform(points_sf, st_crs(la_shapefile))

# Step 9: Plot the map with points in red
#ggplot() +
#  geom_sf(data = la_shapefile, fill = NA, color = "darkgrey", linewidth = 0.5) +
#  geom_sf(data = points_sf, color = "#F9766E", size = 0.1, alpha = 1) +  ##F9766E  619DFF
#  ggtitle("Map of Los Angeles with Female Victims") +
#  theme_minimal() +
#  theme(
#    legend.position = "none",          # Remove legend for uniform color
#    plot.title = element_text(size = 14, face = "bold", hjust = 0.5) # Centered title
#  )

# Step 9: Plot the map with points in red
#ggplot() +
#  geom_sf(data = la_shapefile, fill = NA, color = "darkgrey", linewidth = 0.5) +
#  geom_sf(data = points_sf, color = "#619DFF", size = 0.1, alpha = 1) +  ##F9766E  619DFF
```

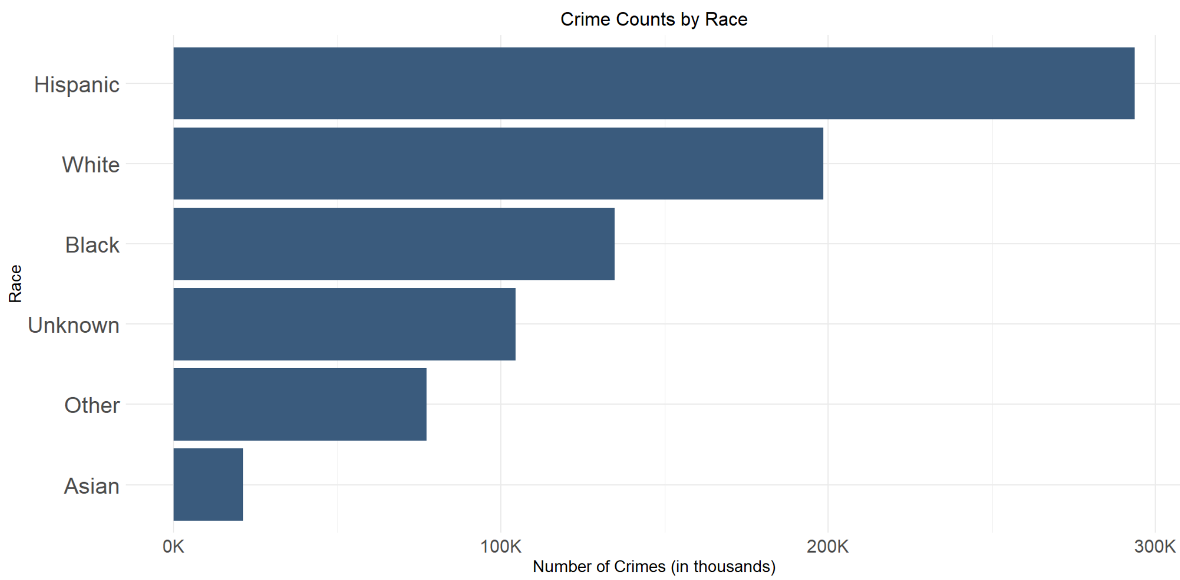
```
#   ggtitle("Map of Los Angeles with Male Victims") +
#   theme_minimal() +
#   theme(
#     legend.position = "none",           # Remove legend for uniform color
#     plot.title = element_text(size = 14, face = "bold", hjust = 0.5) # Centered title
#   )
```





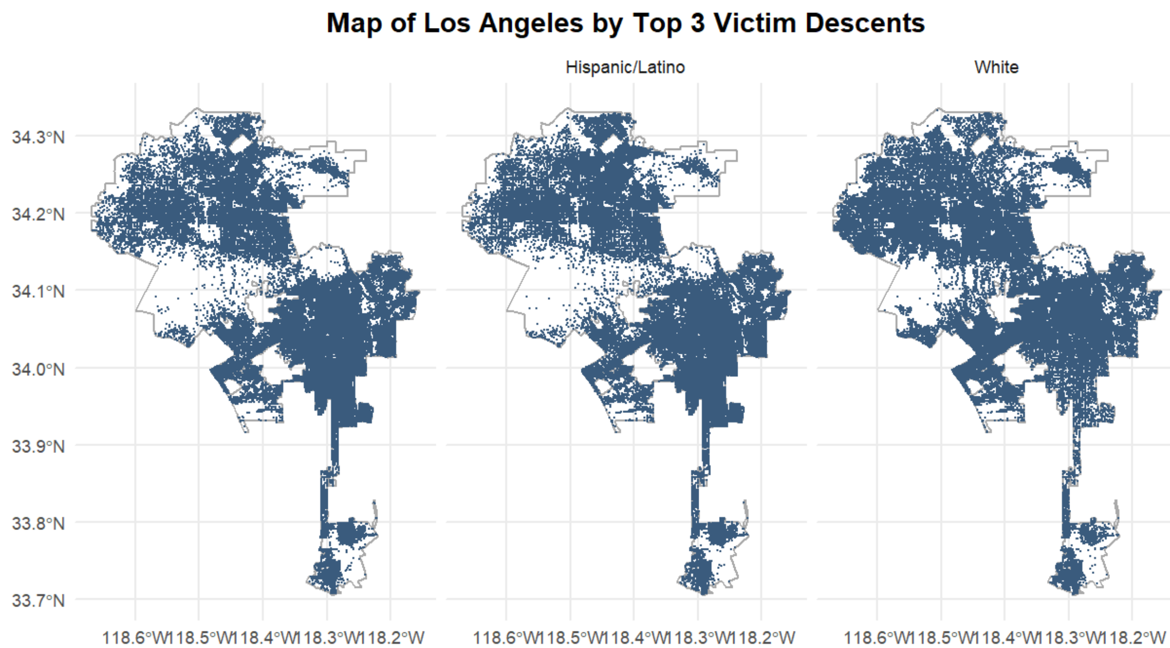

```
#Code and Visualization of Victim Race Distribution:
# Load necessary library
#library(dplyr)

# Read the dataset
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#crime_data <- do.call(rbind, lapply(csv_files, read.csv))

# Define a mapping for race abbreviations
#race_mapping <- c(
#   "B" = "Black",
#   "W" = "White",
#   "H" = "Hispanic",
#   "A" = "Asian",
#   "O" = "Other",
#   "X" = "Unknown"
#)

# Filter for the specified race categories
# valid_races <- names(race_mapping)

#crime_data <- crime_data %>%
```

```
#  filter(Vict.Descent %in% valid_races) %>%
#  mutate(Vict_Descent = recode(Vict.Descent, !!!race_mapping))

# Summarize crime counts by race
# crime_summary <- crime_data %>%
#  group_by(Vict_Descent) %>%
#  summarize(Crime_Count = n(), .groups = 'drop') %>%
#  arrange(desc(Crime_Count))

# Create a horizontal bar graph
# ggplot(crime_summary, aes(x = Crime_Count, y = reorder(Vict_Descent, Crime_Count))) +
#  geom_bar(stat = "identity", fill = "#3A5B7D") +
#  scale_x_continuous(labels = scales::label_number(scale = 0.001, suffix = "K")) +
#  labs(
#    title = "Crime Counts by Race",
#    x = "Number of Crimes (in thousands)",
#    y = "Race"
#  ) +
#  theme_minimal() +
#  theme(
#    axis.text.x = element_text(size = 15),  # Increase font size for x-axis labels
#    axis.title.x = element_text(size = 14), # Increase font size for x-axis title
#    axis.title.y = element_text(size = 14), # Increase font size for y-axis title
#    plot.title = element_text(size = 16, hjust = 0.5), # Center-align and enlarge title
#    axis.text.y = element_text(size = 19)
#  )
```




```
# Load necessary libraries
#library(sf)
#library(tigris)
#library(ggplot2)
#library(dplyr)
#library(stringr) # For string manipulation
#library(readr) # For reading CSV files
#library(tmap)

# Set options for tigris
#options(tigris_class = "sf", tigris_use_cache = TRUE)

# Step 1: Fetch Los Angeles city shapefile
#la_shapefile <- places(state = "CA", cb = TRUE) %>%
#  filter(NAME == "Los Angeles")

# Step 2: Read and combine all CSV files into one data frame
#csv_files <- list.files(path = "data/", pattern = "*.csv", full.names = TRUE)
#csv_data <- do.call(rbind, lapply(csv_files, read.csv))

# Step 3: Filter out rows where LON and LAT are 0 and Vict Descent values are not blank or "
#filtered_data <- csv_data %>%
#  filter(LON != 0, LAT != 0, !is.na(Vict.Descent), Vict.Descent != "-")

# Step 4: Identify top 3 victim descents
```

```
#top_descents <- filtered_data %>%
#  count(Vict.Descent, sort = TRUE) %>%
#  top_n(3, n) %>%
#  pull(Vict.Descent)

# Step 5: Filter data for only the top 3 descents
# Rename Vict Descent values for clarity
#filtered_data <- filtered_data %>%
#  mutate(Vict.Descent = case_when(
#    Vict.Descent == "H" ~ "Hispanic/Latino",
#    Vict.Descent == "W" ~ "White",
#    Vict.Descent == "B" ~ "Black/African American",
#    TRUE ~ Vict.Descent
#  ))

#top_descents <- filtered_data %>%
#  count(Vict.Descent, sort = TRUE) %>%
#  top_n(3, n) %>%
#  pull(Vict.Descent)

# Step 6: Filter data for only the top 3 descents
# filtered_top_descents <- filtered_data %>%
#  filter(Vict.Descent %in% top_descents)

# Step 7: Convert filtered data to an sf object
#points_sf <- st_as_sf(filtered_top_descents, coords = c("LON", "LAT"), crs = 4326)

# Step 8: Transform coordinate system to match Los Angeles shapefile
#points_sf <- st_transform(points_sf, st_crs(la_shapefile))

# Step 9: Plot the map with all points in one color and full descent names
# ggplot() +
#  geom_sf(data = la_shapefile, fill = NA, color = "darkgrey", linewidth = 0.5) +
#  geom_sf(data = points_sf, color = "#3A5B7D", size = 0.1, alpha = 1) +
#  facet_wrap(~ Vict.Descent, ncol = 3) +
#  ggtitle("Map of Los Angeles by Top 3 Victim Descents") +
#  theme_minimal() +
#  theme(
#    legend.position = "none",          # Remove legend for uniform color
#    plot.title = element_text(size = 14, face = "bold", hjust = 0.5) # Centered title
#  )
```



Campaign Development

- **Materials Creation:** Design and distribute informative materials such as flyers, social media graphics, and posters, highlighting crime prevention strategies tailored to specific demographics and high-risk areas.
- **Community Collaboration:** Engage with local leaders and organizations to amplify reach and impact, ensuring materials and messages are culturally and contextually relevant.
- **Workshops:** Conduct safety workshops both in-person and virtually to directly engage with the community, offering practical safety tips and fostering discussions on public safety improvements.

Engagement Strategies

- **Social Media Engagement:** Create dedicated channels for real-time safety updates, leveraging interactive content like polls and educational quizzes to engage a broader audience.

- **Feedback Mechanisms:** Implement online forms and utilize QR codes on campaign materials to gather community feedback and suggestions actively.

Feedback and Continuous Improvement

- **Iterative Refinement:** Regularly update campaign strategies based on community feedback and new crime data insights.
- **Impact Reporting:** Periodically report on campaign effectiveness, utilizing feedback and crime statistics to measure impact and guide future initiatives.

Expected Outcomes

- **Increased Awareness:** Raise awareness about common crimes, enhancing community knowledge and preparedness.
- **Crime Reduction:** Drive down the rates of frequent crimes in targeted high-risk areas.
- **Strengthened Community Relations:** Foster improved trust and collaboration between the LAPD and the Los Angeles residents.
- **Actionable Community Feedback:** Utilize community input to continually adapt and evolve campaign strategies, ensuring relevance and effectiveness.

This detailed proposal outlines a data-driven approach to improve public safety in Los Angeles through informed awareness and strategic community engagement. By harnessing crime data and fostering community collaboration, the campaign aims to create a safer environment for all residents.