Advanced Data Visualization

Experiment - 4

Harshey Kaur Soi

2021300057

BE COMPS A - BATCH G

Aim:

Create Basic charts using PowerBi/Tableau/R/Python/D3.js on dataset crime or police/law and order.

Dataset:

Los Angeles Crime Dataset includes various attributes related to crimes reported in Los Angeles.

Column Descriptions:

1. **DR_NO (Division of Records Number)**:
    - A unique identifier for each crime record.
    - It consists of a combination of the year, area ID, and a sequence of digits.
2. **DATE OCC (Date Occurred)**:
    - The date when the crime occurred.
    - Format: `DD/MM/YYYY` (e.g., 21/07/2024).
3. **TIME OCC (Time Occurred)**:
    - The time at which the crime took place, in a 24-hour format (e.g., `1500` for 3 PM).
4. **AREA**:
    - A numeric code representing the LAPD geographic area in which the crime occurred.
    - The LAPD has 21 geographic areas, numbered sequentially from 1 to 21.
5. **AREA NAME**:
    - The name associated with the LAPD geographic area, typically based on a local landmark or neighborhood.
    - Example: "77th Street Division."
6. **Rpt Dist No (Reporting District Number)**:
    - A four-digit code representing a sub-area within the LAPD's geographic area.
    - Used for statistical and reporting purposes.
7. **Crm Cd (Crime Code)**:
    - A code that represents the type of crime committed. Each crime type has a unique numeric code.
8. **Crm Cd Desc (Crime Code Description)**:

- A description of the crime that occurred.
- Example: "Robbery," "Assault with a Deadly Weapon."

9. **Mocodes (Modus Operandi Codes)**:
   - Codes that describe the suspect's activities and methods during the commission of the crime.
   - Used to analyze patterns and common methods employed in crimes.
10. **Vict Age (Victim Age)**:
    - The age of the victim at the time the crime occurred. ○ Range: 0 (unknown) to 100+.
11. **Vict Sex (Victim Sex)**:
    - The gender of the victim. ○ Possible values:
      - `M` (Male)
      - `F` (Female)
      - `X` (Unknown)
12. **Vict Descent (Victim Descent)**:
    - A code indicating the descent or ethnicity of the victim.
    - Possible values:
      - `A` - Other Asian
      - `B` - Black
      - `C` - Chinese
      - `F` - Filipino
      - `H` - Hispanic/Latin/Mexican
      - `W` - White
      - `X` - Unknown
      - (and other descent codes such as Korean, Japanese, Samoan, etc.)
13. **Premis Desc (Premise Description)**:
    - Describes the type of structure, vehicle, or location where the crime took place.
    - Example: "Street," "Residence," "Vehicle."
14. **Weapon Used Cd (Weapon Used Code)**:
    - A numeric code that identifies the type of weapon used in the crime. ○ Example: `500` (Unknown weapon), `101` (Handgun).
15. **Weapon Desc (Weapon Description)**:
    - A textual description of the weapon used in the crime.
    - Example: "Handgun," "Knife," "Blunt Object."
16. **Status**:
    - The current status of the crime case.

    - Example: `IC` (Initial report), `AA` (Arrest made).
17. **Status Desc (Status Description)**:
    - A description of the case status, explaining whether it's open, closed, or ongoing.
18. **LOCATION**:
    - The approximate street address where the crime occurred.
    - Rounded to the nearest hundred block to maintain anonymity.
19. **LAT (Latitude)**:
    - The latitude coordinate of where the crime occurred, useful for geospatial analysis.
20. **LON (Longitude)**:
    - The longitude coordinate of the crime location.

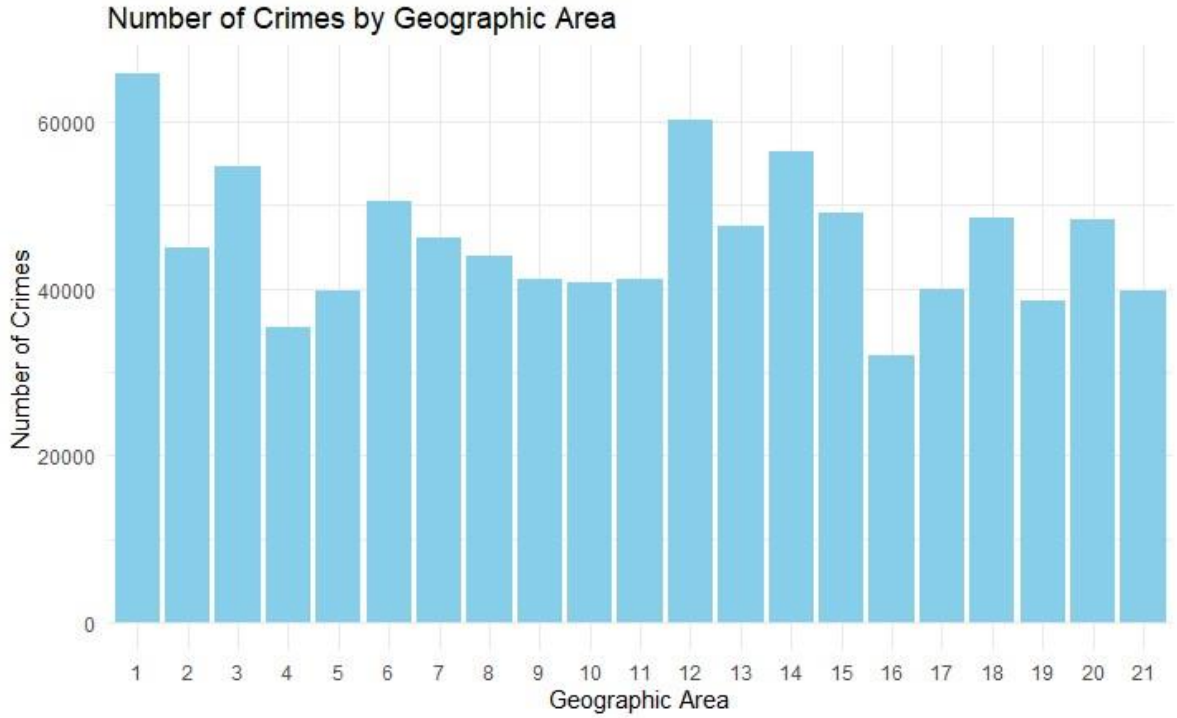
Potential Use Cases:

1. **Geospatial Analysis**: Using the `LAT` and `LON` columns to map crime locations and analyze crime density in different areas.
2. **Temporal Analysis**: Analyzing the `DATE OCC` and `TIME OCC` columns to find trends, such as peak crime hours or days of the week with the most crime.
3. **Demographic Insights**: Studying the `Vict Age`, `Vict Sex`, and `Vict Descent` fields to analyze how different demographic groups are affected by crime.
4. **Crime Types and Locations**: Investigating which types of crimes (`Crm Cd`, `Crm Cd Desc`) are most common in specific areas (`AREA`, `AREA NAME`, `Rpt Dist No`).
5. **Weapon Usage**: Understanding the prevalence of weapon-related crimes by examining the `Weapon Used Cd` and `Weapon Desc` columns.

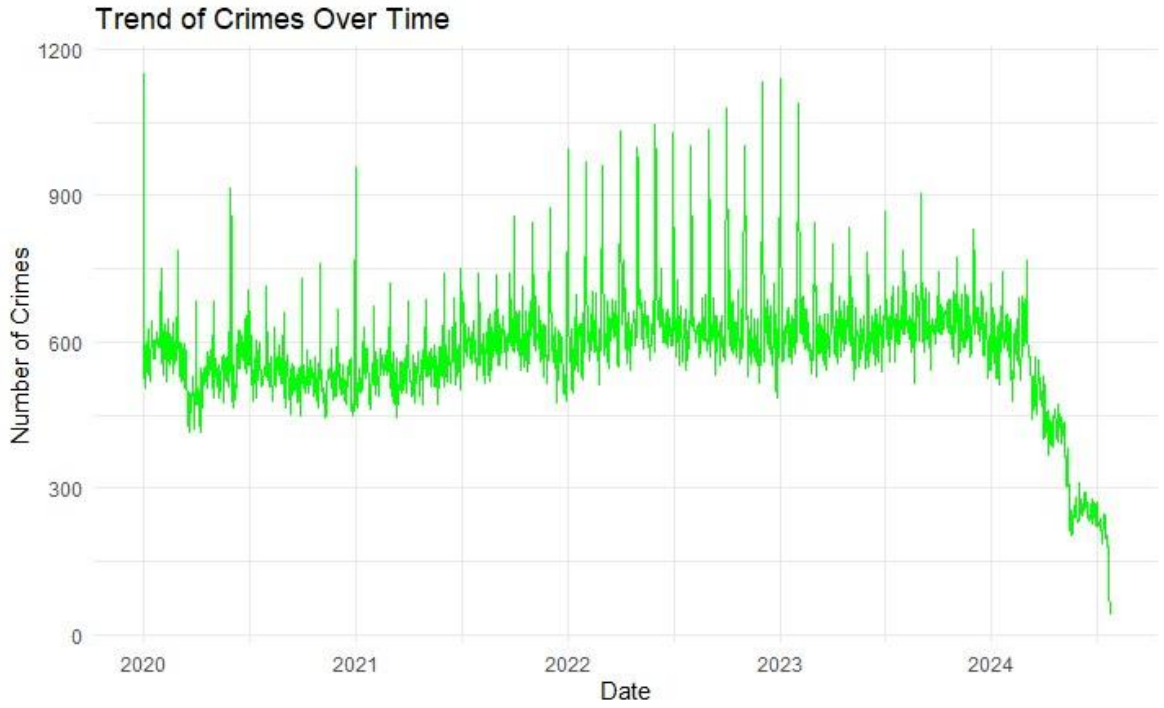
This dataset contains rich information for crime analysis and visualization, allowing for insights into crime patterns, geographic crime distribution, victim demographics, and more.

Basic Charts:

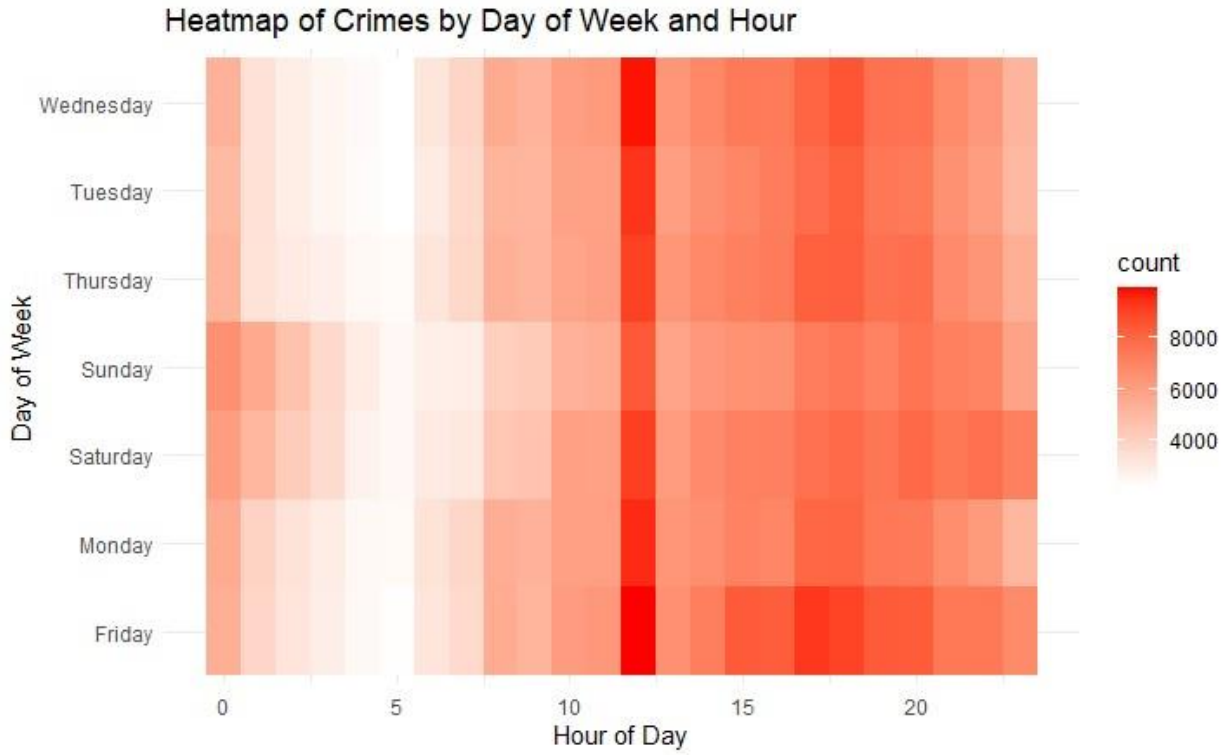
1. Bar Graph - Number of Crimes by Geographic Area



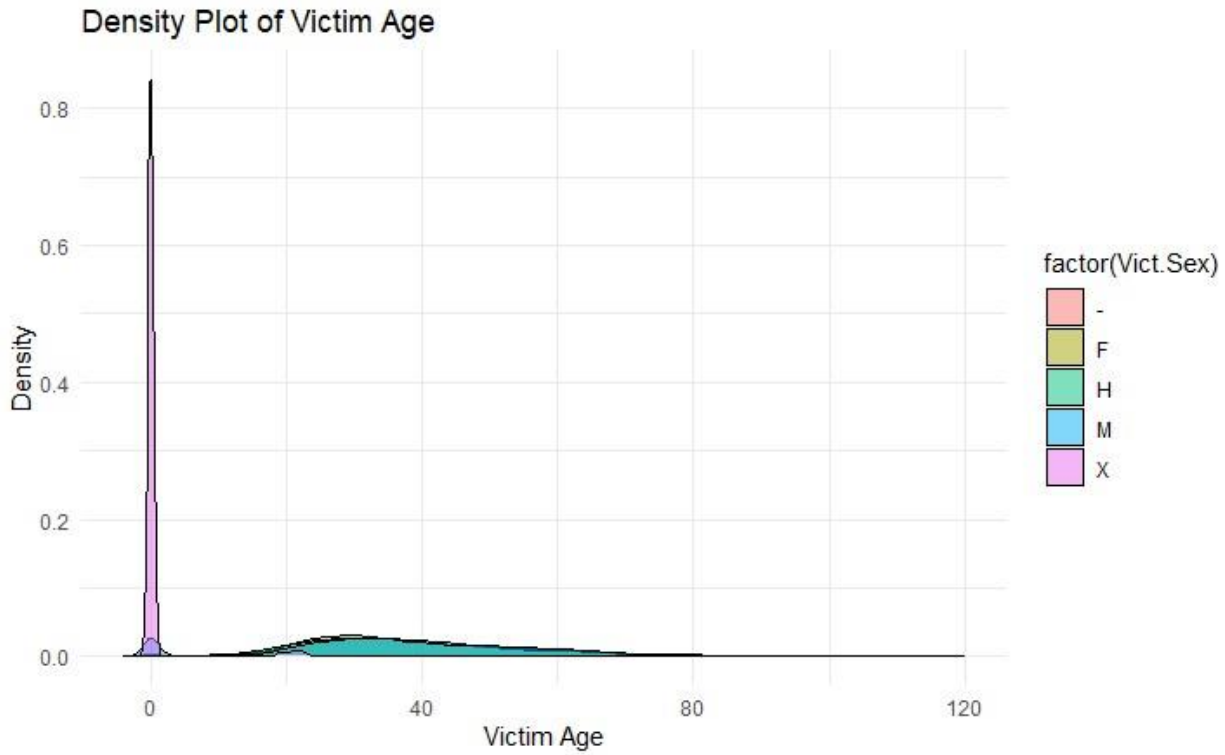
2. Line Chart of Crimes Over Time



3. Heatmap of Crimes by Day of Week and Hour



4. Density Plot of Victim Age



Conclusion:

The experiment on visualizing the Los Angeles Crime Dataset through various chart types, such as bar graphs, line charts, heatmaps, and density plots, successfully demonstrated the ability to uncover significant patterns in crime distribution. Key insights included geographic variations in crime occurrences, temporal trends highlighting peak crime times, and demographic factors like victim age distributions. These visualizations offer practical value for understanding crime hotspots, aiding law enforcement agencies in resource allocation, and identifying potential intervention points. The experiment underscores the importance of data-driven analysis for improving public safety and shaping policy decisions.