Report on

Crime Data Analysis of USA

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Crime Data Analysis of the USA

1. Introduction:

1.1 Overview of the Open-Source Data

This project analyzes crime data from an open-source dataset, providing insights into crime trends across the USA. The dataset includes details on crime types, locations, time of occurrence, and arrest records. It covers multiple years, allowing for trend analysis and identifying crime hotspots.

1.2 Purpose and Goals

The primary objective is to identify crime patterns, high-risk areas, and trends over time. This analysis aids law enforcement agencies, policymakers, and researchers make informed decisions to enhance public safety. Additionally, it helps understand the effectiveness of crime prevention strategies and optimize resource allocation for law enforcement agencies.

1.3 Source and Dataset Selection

The dataset was selected from publicly available crime reports, ensuring accuracy and reliability. It includes structured fields such as Crime Type, Location, Date, Arrest Status, and Community Area. The data was collected from law enforcement records and has been cleaned and processed to ensure consistency and accuracy for analysis.

1.4 Expectations

The analysis aims to uncover crime hotspots, understand seasonal variations, and categorize crimes into violent and non-violent types. The results should facilitate predictive policing and resource allocation. Additionally, the study expects to provide actionable insights that can contribute to improving public safety policies and strategies.

2. Key Questions on Data:

2.1 How has the overall crime rate changed over time?

By analyzing historical trends, we can determine whether crime rates are increasing or decreasing. The study examines variations by year, month, and day to identify significant shifts in criminal activities.

2.2 Which communities have the highest and lowest crime rates?

Identifying high-crime areas helps law enforcement focus on vulnerable regions. The dataset includes community area information, enabling detailed spatial analysis of crime distribution.

2.3 What percentage of crimes are violent compared to non-violent?

This analysis provides insights into crime severity and the level of public safety. Understanding the proportion of violent crimes can help law enforcement agencies prioritize their efforts.

2.4 Are certain crimes, like break-and-enter, increasing or decreasing?

Understanding crime patterns helps in proactive law enforcement strategies. By tracking changes in specific crime types over time, authorities can determine whether intervention strategies are effective.

3. Metrics and KPIs:

3.1 Total Crime Count

Represents the overall number of crimes reported in the dataset. This metric provides an overview of crime volume over a given period and helps in identifying crime trends.

3.2 Arrest Rate

Indicates the percentage of crimes that resulted in arrests. A higher arrest rate may suggest effective law enforcement, while a lower rate may indicate challenges in crime resolution.

3.3 Crimes by Category

Breakdown of different crime types, categorized into violent and non-violent crimes. This metric helps in understanding the severity of crime in different areas.

3.4 Crime Trends Over Time

Analysis of crime patterns across different timeframes (daily, monthly, yearly). This allows for the identification of peak crime periods and seasonal variations in criminal activities.

4. Data Model:

4.1 Overview of the Data

The dataset consists of structured fields such as Case ID, Date, Crime Type, Arrest Status, Location, and Community Area. These attributes provide comprehensive details for crime analysis.

4.2 Entity-Relationship Diagram (ERD)
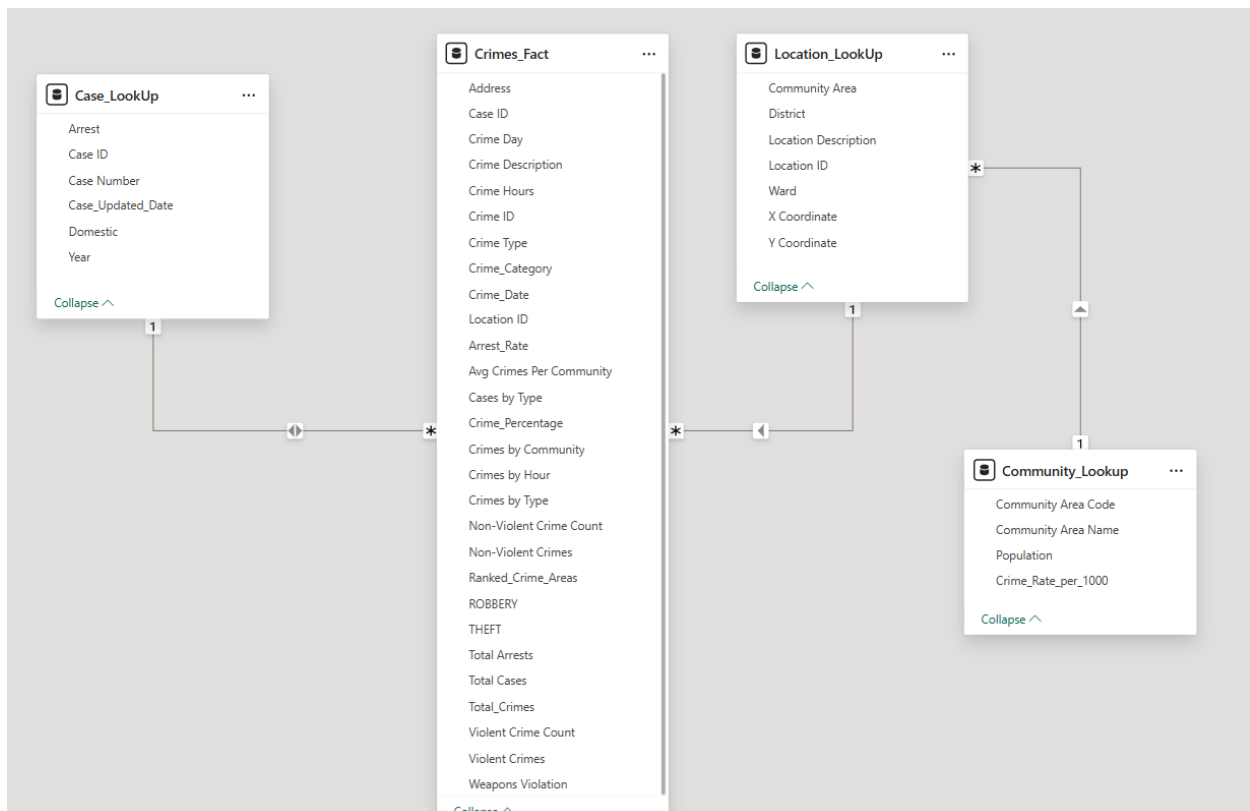
An ERD was designed to illustrate relationships between key entities, including crime reports, locations, and time-based attributes. It helps in understanding how different data points interact and contribute to overall crime analysis.

4.3 Other Tables (Measure Table, Group by Table)

Additional tables were created to store aggregated metrics for enhanced visualization and analysis. These tables facilitate efficient querying and data representation in dashboards.
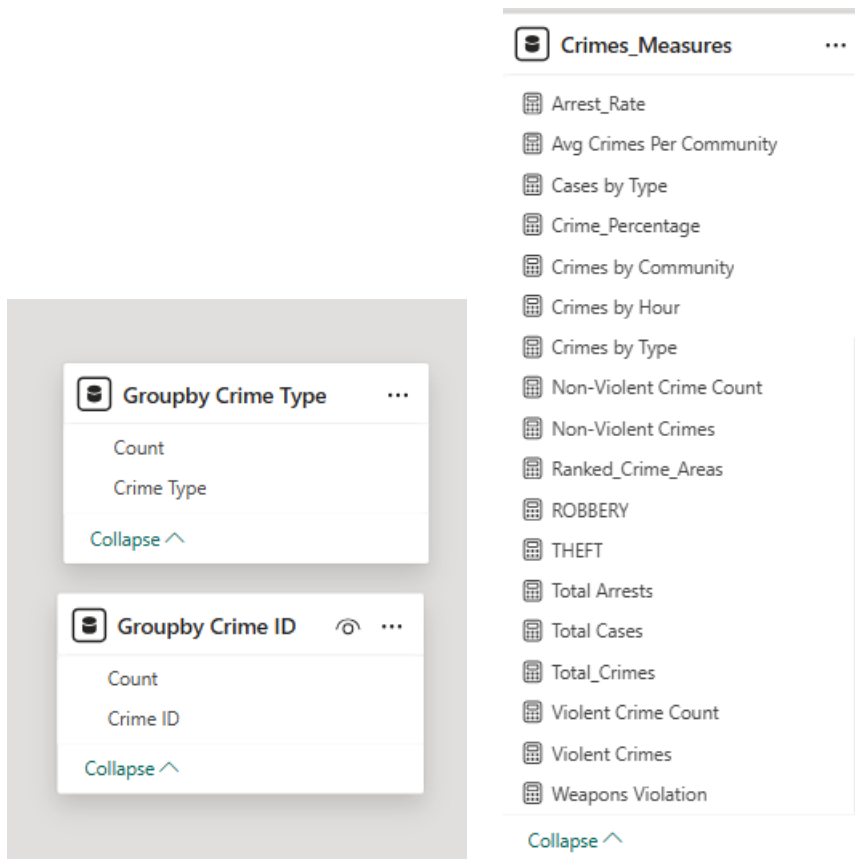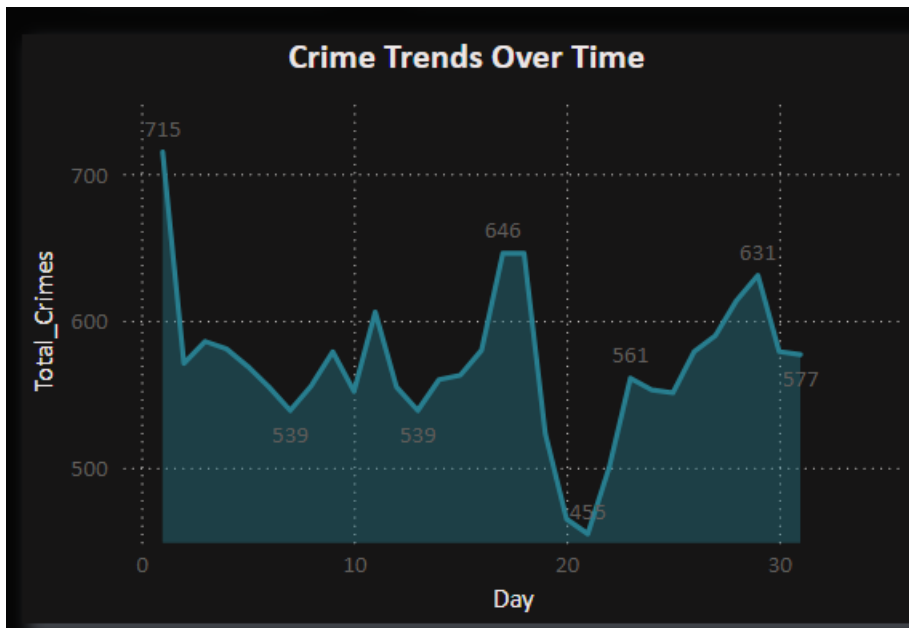

5. Results:

5.1 Analysis Results

1. **Total Crime Count** – The dashboard provides a clear representation of the total number of crimes recorded. This helps in understanding crime volumes across different timeframes.

Total Crimes

18K

2. **Crime Trends Over Time** – The line chart visualizes fluctuations in crime rates by year and month, highlighting seasonal patterns.

3. **Crime Categories Breakdown** – A pie chart differentiates violent and non-violent crimes, allowing for a quick assessment of crime severity.
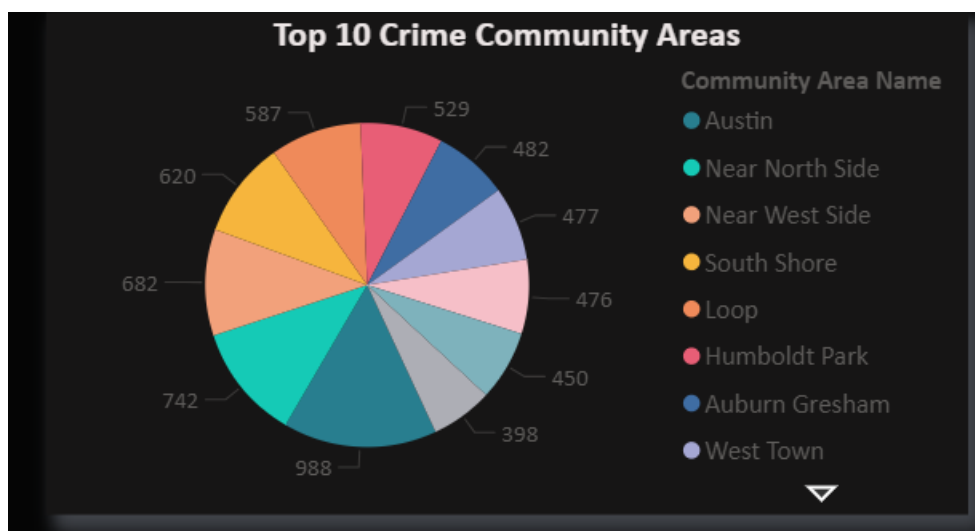
4. **Top 5 Non-Violent Crimes** – A bar chart shows the most frequently occurring non-violent crimes, helping in resource allocation for prevention.
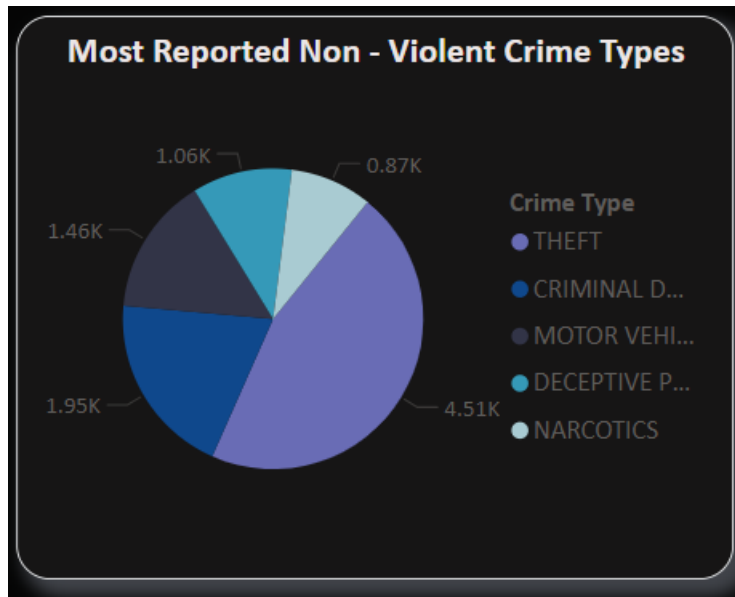

5. **Geospatial Analysis** – A map visual displays crime distribution across different community areas, identifying high-risk zones.

6. **Arrest Rate** – The dashboard calculates and visualizes the percentage of crimes that led to arrests, providing insight into law enforcement effectiveness.
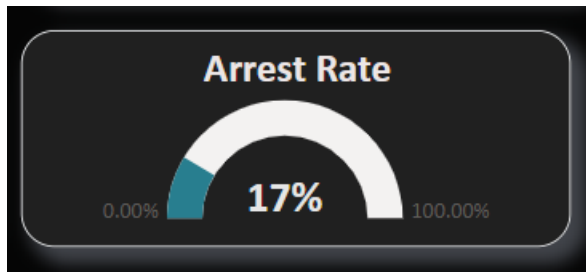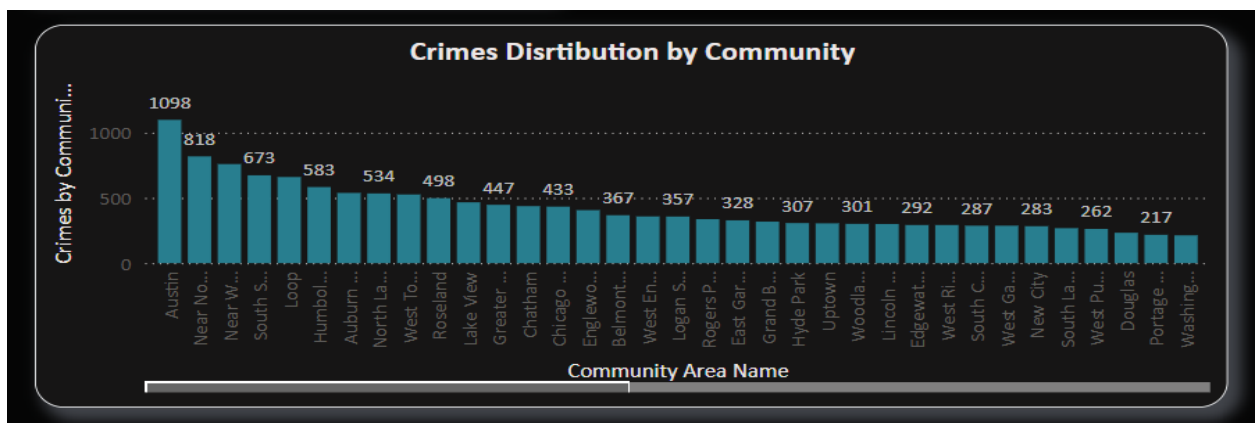

7. **Crime by Hour & Day** – Time-based analysis reveals when crimes are most likely to occur, helping in law enforcement scheduling and community awareness.
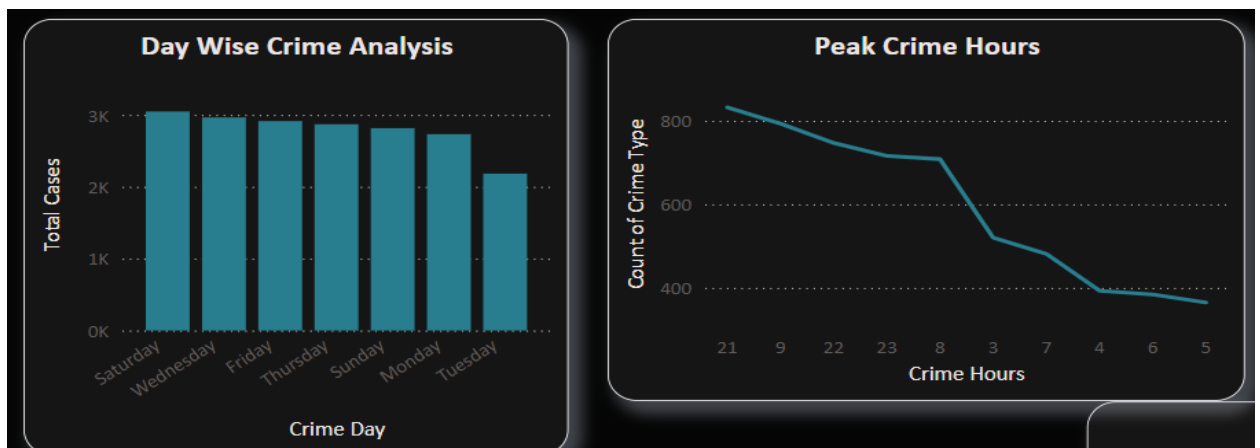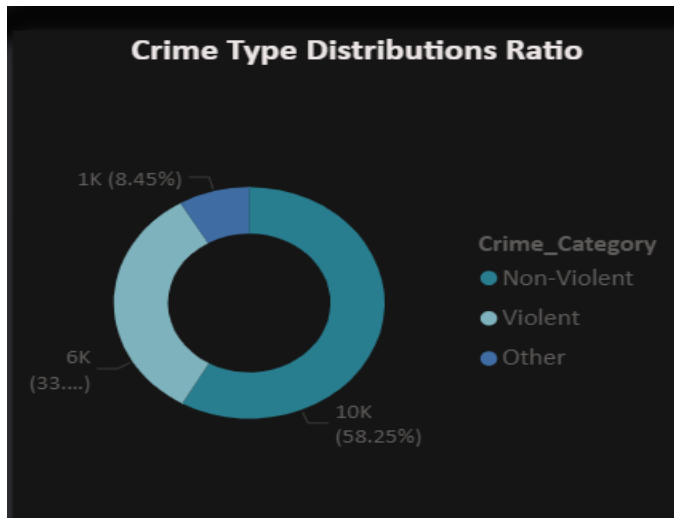

5.2 Key Findings

- **High-Crime Areas** – Certain community areas consistently report higher crime rates, making them priority zones for intervention.

- **Violent vs. Non-Violent Crime Distribution** – Violent crimes make up a significant portion of total crime, indicating a need for stronger security measures.

5.3 Business Implications

- **Resource Allocation** – Law enforcement agencies can optimize their patrolling schedules based on crime trends.

- **Community Safety Initiatives** – Insights can guide public safety programs and community awareness campaigns.

- **Policy Recommendations** – Authorities can use data-driven findings to implement better crime prevention strategies.

- **Predictive Modeling for Future Crimes** – The trends identified in the dashboard can help forecast future crime patterns and support proactive policing.

6. Conclusions:

The crime data analysis highlights crucial trends and patterns. The findings can guide law enforcement agencies in proactive measures, ultimately improving public safety and crime prevention strategies. By leveraging data-driven insights, authorities can enhance policing efforts and implement effective crime reduction policies.
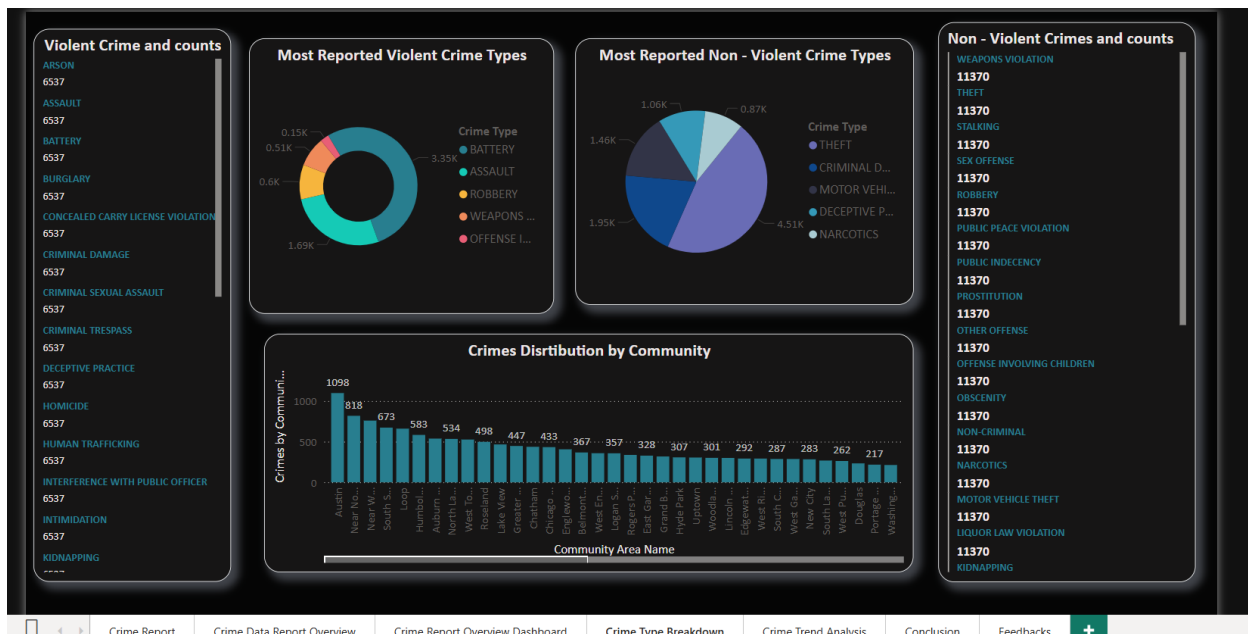
7. Appendices:

7.1 Power BI Dashboard

The interactive Power BI dashboard provides real-time visualizations of crime trends, hotspots, and key metrics. It includes:

Dashboard 1: Crime Report Overview Dashboard

Dashboard 2: Crime Type Breakdown

Dashboard 3: Crime Trend Analysis