Analyzing Patterns and Outcomes of Crimes and Arrests in Urban Areas of Los Angeles in USA

Methods of Advanced Data Engineering

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Introduction

The project leverages two comprehensive datasets of crime and arrest reports from 2020 to present time to uncover patterns and correlations in urban crime and law enforcement activities in Los Angeles.

Research Questions

➢ Does the frequency and type of arrests correlate with reductions in crime rates in specific neighborhoods over time??

➢ Are there identifiable patterns in victim demographics (age, sex, descent) for specific types of crimes??

Data Sources and Structure

❖ **Data source-1:** Crime Data from 2020 to present.

➢ *Data Source:* The Home of the U.S. Government's Open Data.

➢ *Format:* Tabular Format- CSV

➢ *License and Permission:* Licensed under the CC0 1.0 Universal Public Domain Dedication, allowing unrestricted use, modification, and distribution.

```
   Date of Crime    AREA NAME    Crm Cd Desc  Vict Age  Vict Sex  Vict Descent
0     2020-03-01     Wilshire  Vehicle Theft         0         M             O
1     2020-02-08      Central       Burglary        47         M             O
2     2020-11-04    Southwest  Vehicle Theft        19         X             X
3     2020-03-10     Van Nuys        Larceny        19         M             O
4     2020-03-01   Hollenbeck       Burglary        27         M             W
```

Fig-1: Output of data pipeline of crime dataset.

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Data Sources and Structure

❖ **Data source-2:** Arrest Data from 2020 to present.

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```
   Date of Arrest  Arrest Area Name  Charge Group Description  Age Sex Code  \
0      2023-07-14          Hollywood         Prostitution/Allied   30        M
1      2023-11-10            West LA               Vehicle Theft   40        M
2      2023-09-08         Devonshire           Disorderly Conduct  63        M
3      2023-07-14           Wilshire                     Larceny   24        F
4      2023-07-15        N Hollywood         Weapon (carry/poss)   42        M

   Descent Code
0             O
1             H
2             H
3             B
4             H
```

Fig-1: Output of data pipeline of arrest dataset.

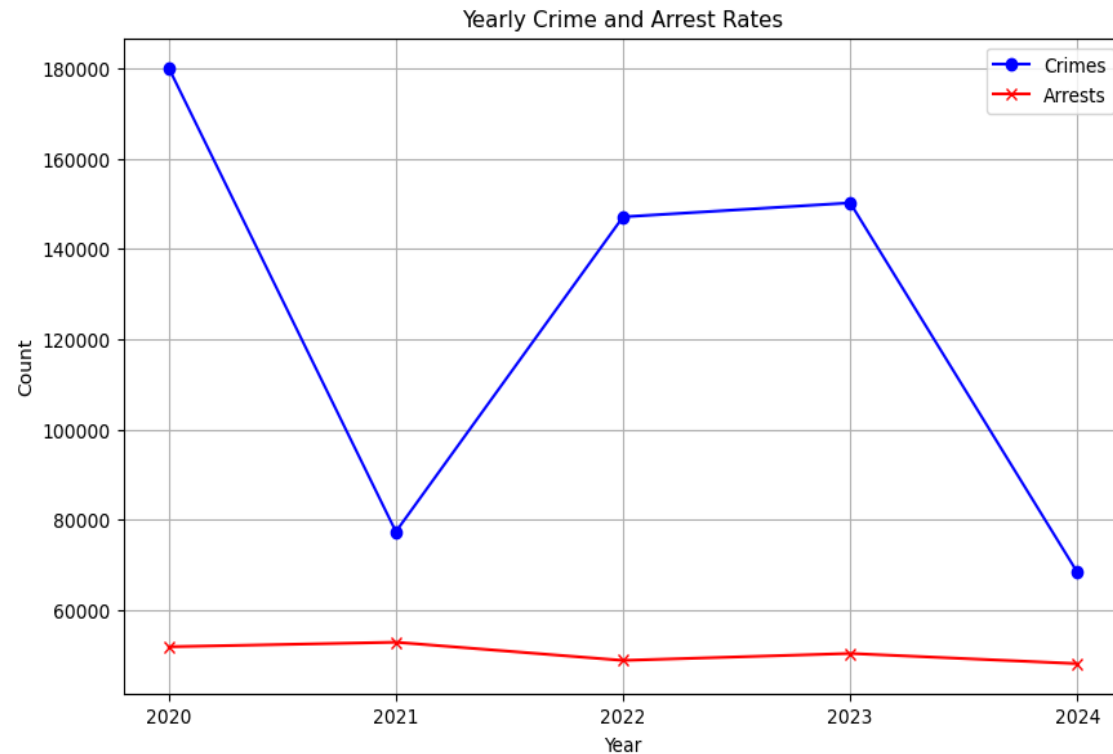# Analysis - Correlation between Arrests and Crime Rates

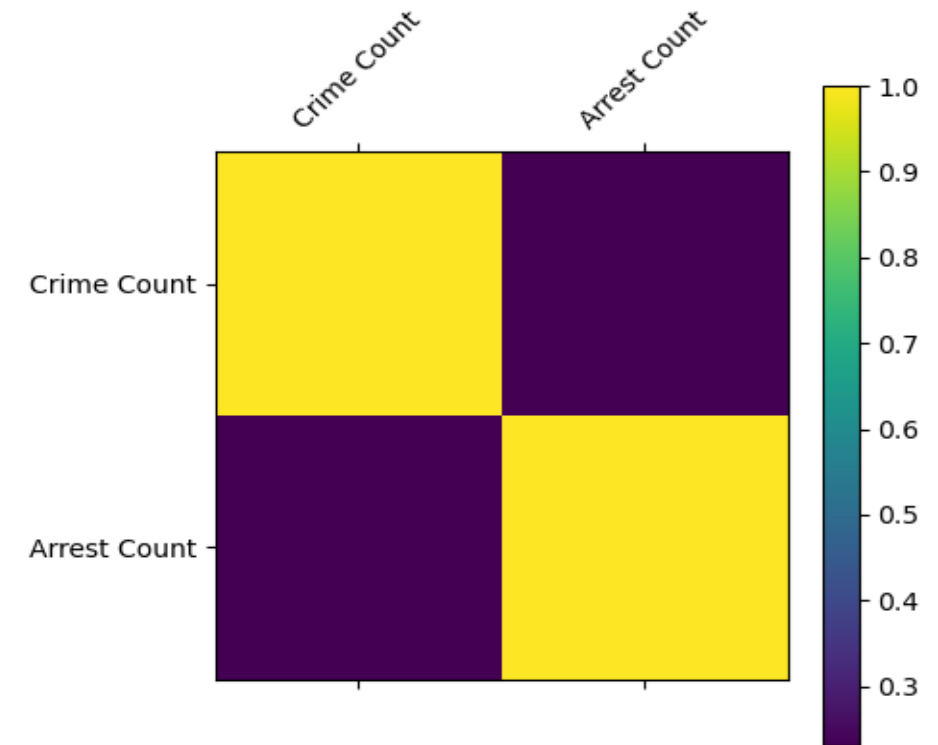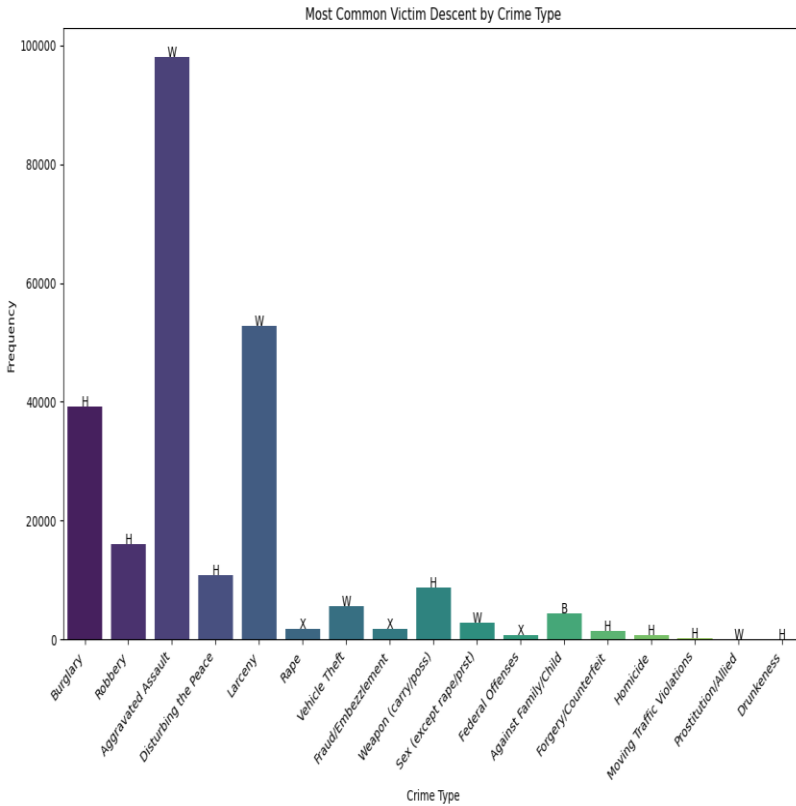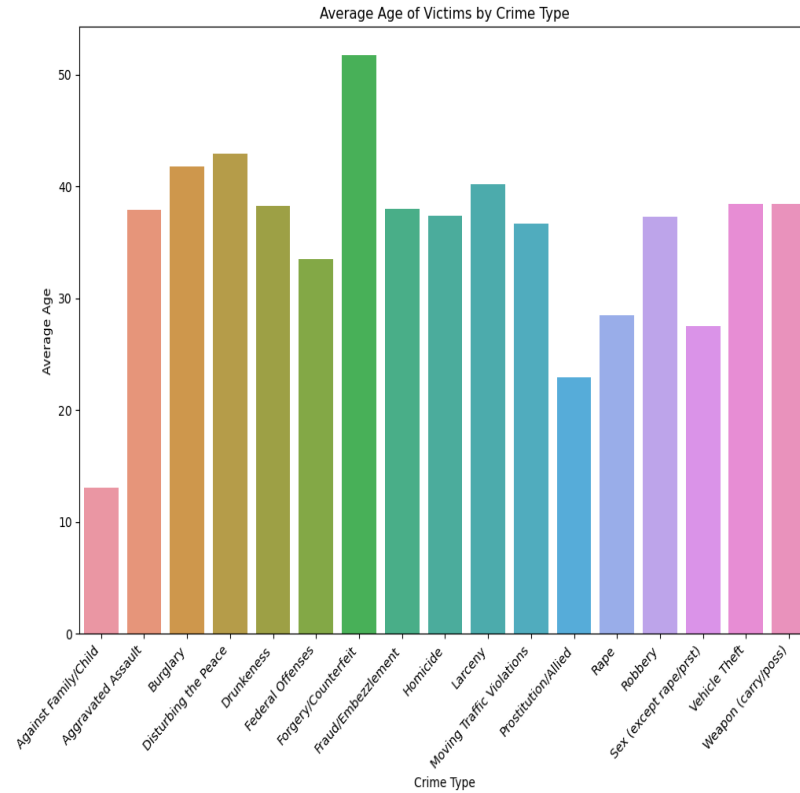Fig-1:Crime and Arrest rates over the year.

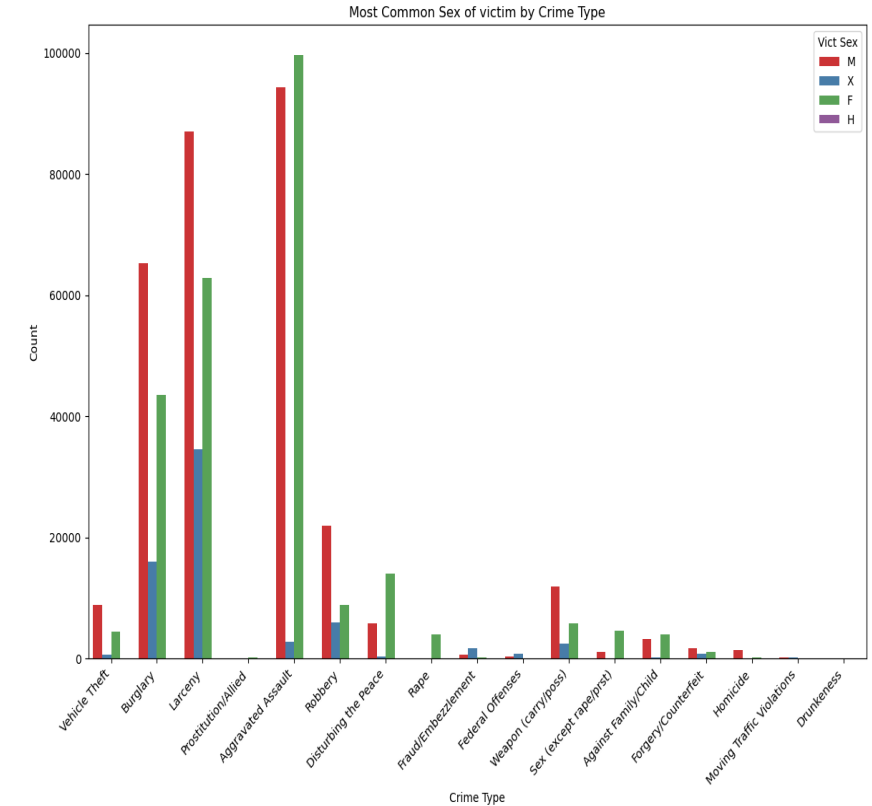Fig-2: Correlation matrix of crime and arrest count.

Analysis- Victim Demographics

Fig-3: Most common victim descent by crime type

Fig-4: Average age of victims by crime type

Fig-5: Victim by sex and crime Type
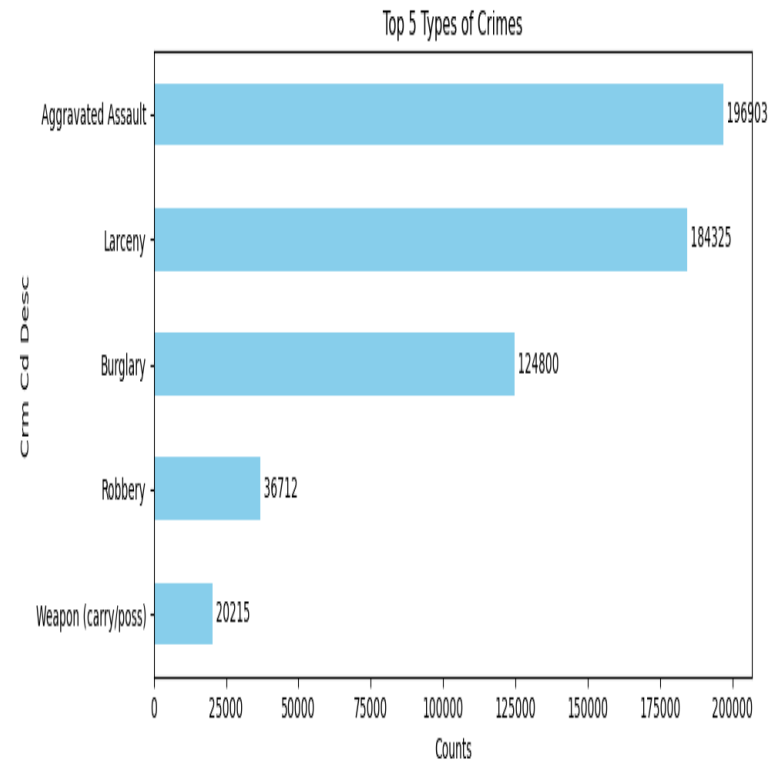
Analysis- Crime Analysis
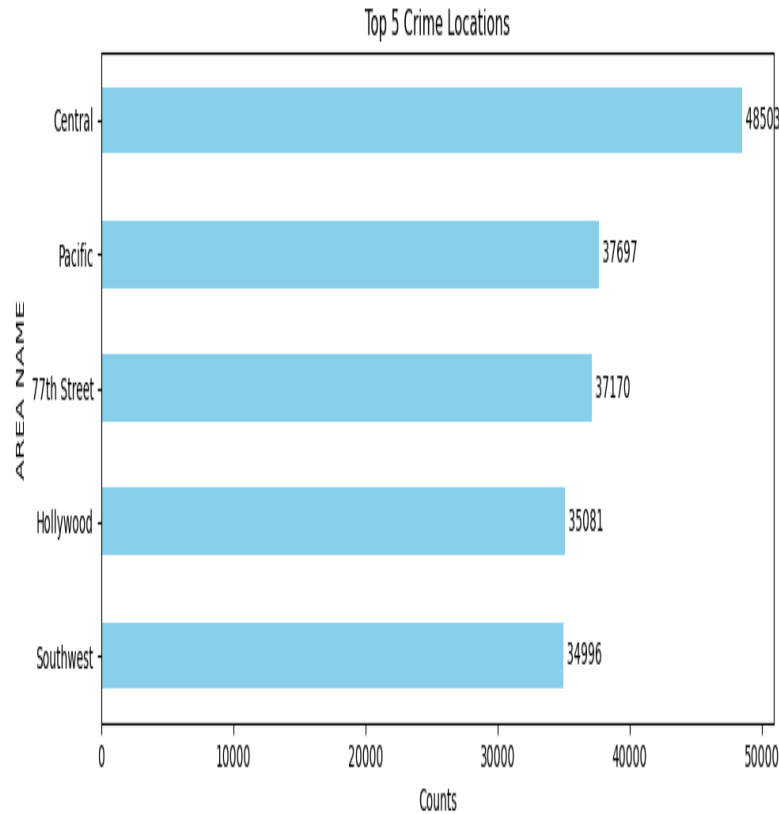

Fig-6: Top 5 Types of Crimes
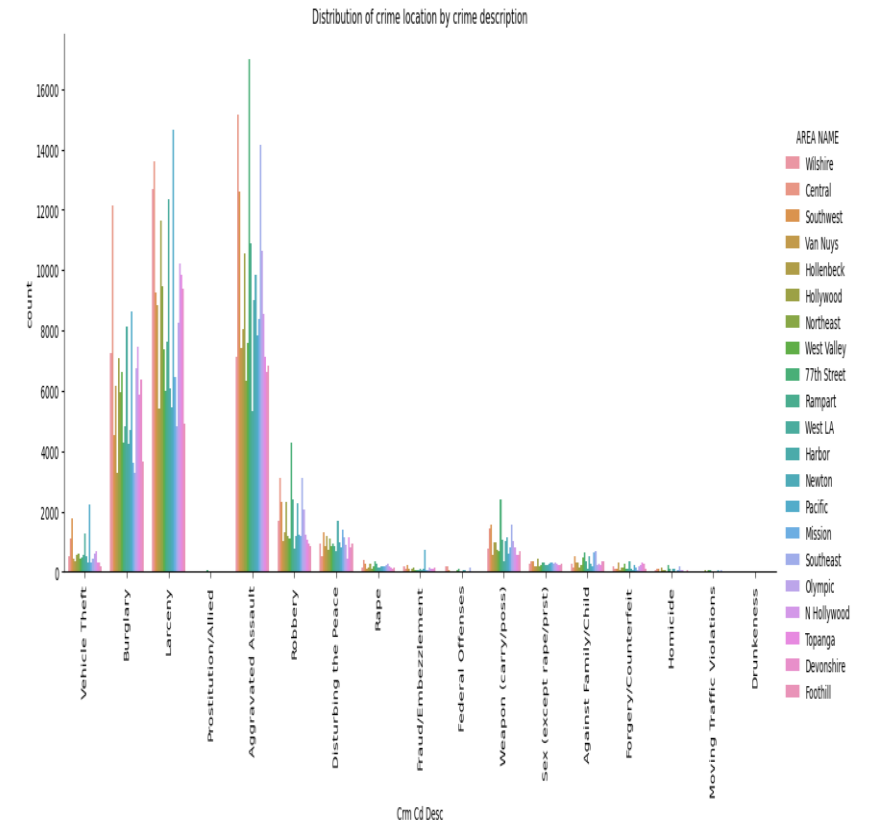
Fig-7: Top 5 locations of Crimes

Fig-8: Distribution of Crime by location

Discussions

➢ Weak Correlation: Minor link between crime increases and arrests, emphasizing the influence of policing strategies.

➢ Victim Demographics:

      Young Children: Common victims in family crimes.

      Elderly: Vulnerable to financial crimes.

      Males and Hispanic Individuals: Often targeted in larcenies and assaults.

➢ Geographic Focus: Central Los Angeles requires targeted law enforcement and community intervention.

Conclusion

Ultimately, improving law enforcement effectiveness and reducing crime rates will likely require a mix of enhanced community policing, better resource use and targeted policies. Need to focus on root causes of crime tailored to specific community needs.