CRIME DATA ANALYSIS

A

PBL

Submitted in partial fulfilment of the Subject

Data Science (MCA-205)

for the award of the degree of

MASTER OF COMPUTER APPLICATION

IN

Computer Science and Application

By

Prashant Singh
MCAN1CA22019

Submitted to

Dr. Sanjay Jain (Professor)

Department of Computer Science Engineering

School of Engineering and Technology

ITM UNIVERSITY, GWALIOR - 474026 MP, INDIA

(April 2023)

Table of Contents

1. Introduction 1

1.1 Abstract of PBL 1

2. Introduction to Dataset 3

2.1 Dataset Description **3**

2.1.1 CSV: Crime_Data_from_2020_to_Present.csv **4**

3. Data Pre-processing 6

3.1 CSV: Cleaned_Data.csv 7

4. Data Analysis 8

4.1 Quantitative analysis 9

4.2 Analysis using Visualization 13

5. Conclusion 20

6. Future Work 21

1. Introduction

Crime data analysis is a critical need in the United States due to the increasing number of crimes committed each year. The data collected through various sources such as police reports, surveys, and victimization studies can provide valuable insights into the nature and extent of crime in different regions. Crime data analysis is necessary to identify trends and patterns in crime, including the types of crimes committed, their frequency, and locations. By analyzing this information, law enforcement agencies and policymakers can develop effective strategies to reduce crime rates and improve public safety. Moreover, crime data analysis can help identify gaps in law enforcement measures and address issues related to social and economic inequalities, which can contribute to higher crime rates in certain areas.

The US government and law enforcement agencies collect crime data from various sources and maintain a national crime database to keep track of crimes committed in the country. However, crime rates and trends can vary significantly across different US states due to factors such as demographics, socio-economic status, and culture. By analyzing crime data at the state level, it is possible to gain valuable insights into the nature and extent of crime, as well as the effectiveness of law enforcement measures in different regions. This information can then be used to develop and implement policies and strategies that can help prevent crime and improve public safety in US states. Therefore, crime data analysis is an essential tool in ensuring the security and well-being of the citizens of the United States.

1.1 Abstract of PBL

This data analysis focuses on exploring whether there is a correlation between gender demographics and the types of crimes they are more likely to be victims of. The study is based on the Gov Crime Data from Los Angeles, CA, USA, which is collected by the National Crime Victimization Survey (NCVS) to keep track of crime data. By examining the prevalence of different types of crime victimization among men, women, non-binaries, and other genders,

this analysis aims to provide valuable insights into the nature and extent of crimes based on gender demographics.

However, the data collected by NCVS contains many discrepancies and outliers that need to be cleaned before proceeding with analysis. This involves identifying and removing any erroneous data points, and transforming the data to a format that can be easily analyzed. Once the data is cleaned, various statistical and visual analyses can be conducted, providing valuable insights into the hidden trends in the data. For example, the analysis might reveal the variance in gender-based crimes, the types of weapons most commonly used in crimes, and other patterns in the data that may not have been immediately apparent.

By identifying these hidden trends, the analysis can help to inform law and order systems in the city to introduce protective measures to reduce the occurrence of crimes. For instance, if the analysis finds that women are more likely to be victims of a certain type of crime, the law enforcement agencies can introduce measures to protect women from that type of crime. Similarly, if the analysis identifies a pattern in the types of weapons used in crimes, this information can be used to introduce measures to reduce the availability of those weapons and decrease their use in crimes. Ultimately, the insights provided by this analysis can help to improve public safety and reduce crime rates in Los Angeles, CA, USA.

2. Introduction to Dataset

The importance of obtaining valid and accurate data cannot be overstated in any research or analysis. The reliability of research outcomes is dependent on the validity and accuracy of the data being used. Data must be collected with utmost care and attention to detail to ensure that it is accurate, complete, and relevant to the research questions being addressed. Accurate data is essential for making well-informed decisions, policies, and interventions that can significantly impact individuals and society. On the other hand, relying on inaccurate data can lead to flawed policies and ineffective interventions that can have negative consequences for individuals and society at large. In fields such as crime data analysis, where the stakes are high, ensuring the validity and accuracy of data is particularly crucial. The consequences of incorrect data can be severe, leading to misguided policies and failed interventions that can have long-lasting and devastating effects. Therefore, it is vital to prioritize the collection and maintenance of accurate and valid data to ensure the reliability and effectiveness of research and analysis in all fields.

2.1 Dataset Description

The data source used in this project has been extracted from the existing data on Catalog.Data.Gov site. From the creator of dataset:

"*This dataset reflects incidents of crime in the City of Los Angeles dating back to 2020. This data is transcribed from original crime reports that are typed on paper and therefore there may be some inaccuracies within the data. Some location fields with missing data are noted as (0°, 0°). Address fields are only provided to the nearest hundred block in order to maintain privacy.*"

Dataset Link: Gov Crime Data from Los Angeles, CA, USA

The dataset is of the shape of: (677905, 28)

677905 Observations with respect to 28 Attributes

Following is detailed description of table of dataset that is used in the PBL Project (with Dtypes):

2.1.1 CSV: Crime_Data_from_2020_to_Present.csv

Attribute	Dtype	Attribute Description
DR_NO	int64	Crime DR number (Entry number)
Date Rptd	object	Date of reporting of crime
DATE OCC	object	Actual date when crime occurred
TIME OCC	int64	Actual time when crime occurred
AREA	int64	AREA (Code) where crime occurred
AREA NAME	object	AREA Name where the crime occurred
Rpt Dist No	int64	District in the Area
Part 1-2	int64	Part of the Model Penal Code of USA
Crm Cd	int64	Crime Code According to MPC
Crm Cd Desc	object	Crime Code Description
Mocodes	object	“Modus Operandi" CODES
Vict Age	int64	Age of the victim
Vict Sex	object	Sex/Gender of Victim
Vict Descent	object	Racial Descent of the Victim
Premis Cd	float64	Premise where the crime occurred
Premis Desc	object	Description of the premise
Weapon Used Cd	float64	Weapon(s) used (if any)
Weapon Desc	object	Description of weapon(s)
Status	object	Status of the investigation
Status Desc	object	Status description
Crm Cd 1	float64	Detailed Crime codes
Crm Cd 2	float64	Detailed Crime codes
Crm Cd 3	float64	Detailed Crime codes
Crm Cd 4	float64	Detailed Crime codes
LOCATION	object	Location of the reported crime
Cross Street	object	Street address of the reported crime
LAT	float64	Latitude of the reported crime
LON	float64	Longitude of the reported crime

Initial dataset instance:

	DR_NO	Date Rptd	DATE OCC	TIME OCC	AREA	AREA NAME	Rpt Dist No	Part 1-2	Crm Cd	Crm Cd Desc	...
0	10304468	01/08/2020 12:00:00 AM	01/08/2020 12:00:00 AM	2230	3	Southwest	377	2	624	BATTERY - SIMPLE ASSAULT	...
1	190101086	01/02/2020 12:00:00 AM	01/01/2020 12:00:00 AM	330	1	Central	163	2	624	BATTERY - SIMPLE ASSAULT	...
2	200110444	04/14/2020 12:00:00 AM	02/13/2020 12:00:00 AM	1200	1	Central	155	2	845	SEX OFFENDER REGISTRANT OUT OF COMPLIANCE	...
3	191501505	01/01/2020 12:00:00 AM	01/01/2020 12:00:00 AM	1730	15	N Hollywood	1543	2	745	VANDALISM - MISDEAMEANOR ($399 OR UNDER)	...
4	191921269	01/01/2020 12:00:00 AM	01/01/2020 12:00:00 AM	415	19	Mission	1998	2	740	VANDALISM - FELONY ($400 & OVER, ALL CHURCH VA...	...

...	Status	Status Desc	Crm Cd 1	Crm Cd 2	Crm Cd 3	Crm Cd 4	LOCATION	Cross Street	LAT	LON
...	AO	Adult Other	624.0	NaN	NaN	NaN	1100 W 39TH PL	NaN	34.0141	-118.2978
...	IC	Invest Cont	624.0	NaN	NaN	NaN	700 S HILL ST	NaN	34.0459	-118.2545
...	AA	Adult Arrest	845.0	NaN	NaN	NaN	200 E 6TH ST	NaN	34.0448	-118.2474
...	IC	Invest Cont	745.0	998.0	NaN	NaN	5400 CORTEEN PL	NaN	34.1685	-118.4019
...	IC	Invest Cont	740.0	NaN	NaN	NaN	14400 TITUS ST	NaN	34.2198	-118.4468

3. Data Pre-processing

Mixed data in a data set can be a challenge when performing data analysis. Mixed data refers to data sets that contain both numerical and categorical data. While numerical data can be easily analyzed using mathematical and statistical tools, categorical data requires different approaches to extract meaningful insights. One cannot perform analysis on mixed data directly, and it is essential to manipulate the data to create new data sets that can be analyzed using statistical and mathematical tools. This requires data manipulation techniques such as one-hot encoding, label encoding, and feature scaling. By creating new data sets that contain only numerical data or properly encoded categorical data, it becomes possible to perform analysis and extract meaningful insights. Therefore, data manipulation is an essential step in the data analysis process, particularly when dealing with mixed data. It ensures that the data is in the correct format for analysis and leads to more accurate results.

From the given dataset I have dropped multiple attributes that were inducing redundancy.

I have removed ‘Crm Cd Desc', 'AREA NAME', 'Premis Desc', 'Weapon Desc','Status Desc', ,'Cross Street' as these were already referenced with their respectable codes as given and table below.

I have removed 'DR_NO', 'Mocodes','LAT','LON','LOCATION','Vict Descent','Crm Cd 1','Crm Cd 2','Crm Cd 3','Crm Cd 4' as these values were not required for the analysis.

I have also removed the crimes whose count was less than the threshold value of 1000 as these were very negligible and only occur seldomly in random pattern which is why it is not usable in our analysis.

The shape of the new dataset is: (659622, 12)

659622 Observations with respect to 12 Attributes

Following are the attributes of extracted data:

3.1 CSV: Cleaned_Data.csv

Attributes	Dtypes
Date Rptd	object
DATE OCC	object
TIME OCC	int64
AREA	int64
Rpt Dist No	int64
Part 1-2	int64
Crime Code	int64
Vict Age	int64
Vict Sex	object
Premis Cd	float64
Weapon Used Cd	float64
Status	Object

Further pre-processing would be required temporarily for the analysis part which would be done at the time of processing. This pre-processing would generally be grouping of the data and separating groups from each other.

Dataset After Initial Pre-processing:

	Date Rptd	DATE OCC	TIME OCC	AREA	Rpt Dist No	Part 1-2	Crm Cd	Vict Age	Vict Sex	Premis Cd	Weapon Used Cd	Status
0	01-08-2020	01-08-2020	2230	3	377	2	624	36	F	501	400	AO
1	01-02-2020	01-01-2020	330	1	163	2	624	25	M	102	500	IC
2	01-01-2020	01-01-2020	1730	15	1543	2	745	76	F	502	NaN	IC
3	01-01-2020	01-01-2020	415	19	1998	2	740	31	X	409	NaN	IC
4	01-02-2020	01-01-2020	30	1	163	1	121	25	F	735	500	IC

4. Data Analysis

Crime data analysis is crucial in understanding crime patterns and trends, as well as the effectiveness of law enforcement measures in preventing and responding to crime. It can provide valuable insights into the nature and extent of crime in a given area, as well as the demographic groups that are most at risk of being victimized. By analyzing crime data, policymakers and law enforcement agencies can identify areas where crime is most prevalent and implement targeted interventions and policies to prevent and reduce crime. This information can be used to allocate resources more efficiently and effectively, as well as to develop evidence-based strategies for improving public safety.

Moreover, crime data analysis can also help in identifying new types of crime, emerging crime trends, and the geographical patterns of crime. It can provide valuable information on the causes of crime, such as poverty, unemployment, or social inequality, which can help policymakers in developing strategies to address the root causes of crime. Additionally, crime data analysis can be useful in evaluating the effectiveness of various crime prevention and intervention programs, and identifying areas where improvement is needed.

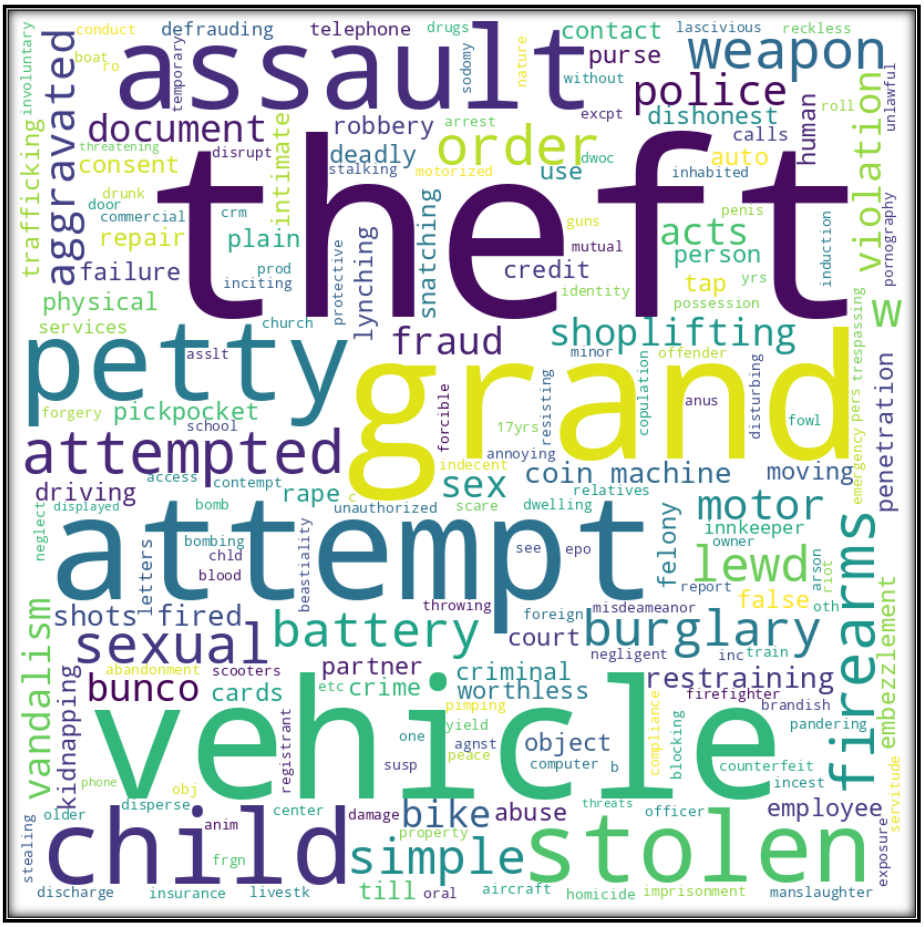

Fig A
Word cloud made using the dataset

4.1 Quantitative analysis

Quantitative analysis plays a crucial role in crime data analysis. It is essential to use quantitative methods to analyze crime data as it provides an objective and systematic approach to examine patterns and trends in criminal activity. Quantitative analysis involves the use of statistical and mathematical methods to identify patterns, relationships, and correlations in the data.

Firstly, I have grouped the data with respect to crime codes so we can take a look at what are the figures of occurrence for each crime data. From the figure 1, the mean of this data represents that on average there are ***13461*** cases of crime for each code per year, which when taken in consideration with the size and population of Los Angeles may seem average but this data also includes violent crimes such as assault and battery, which emphasizes the role of police and executives that can lead to more peaceful society.

Also looking at the figure 1 and taking in consideration of the skewness of the data is ***1.6154890828390516*** and kurtosis of the same is ***2.0767431849393554***, suggests that there are some crimes which occur more frequently than others. These crimes are small crimes like petty theft, shoplifting, burglary and etcetera.

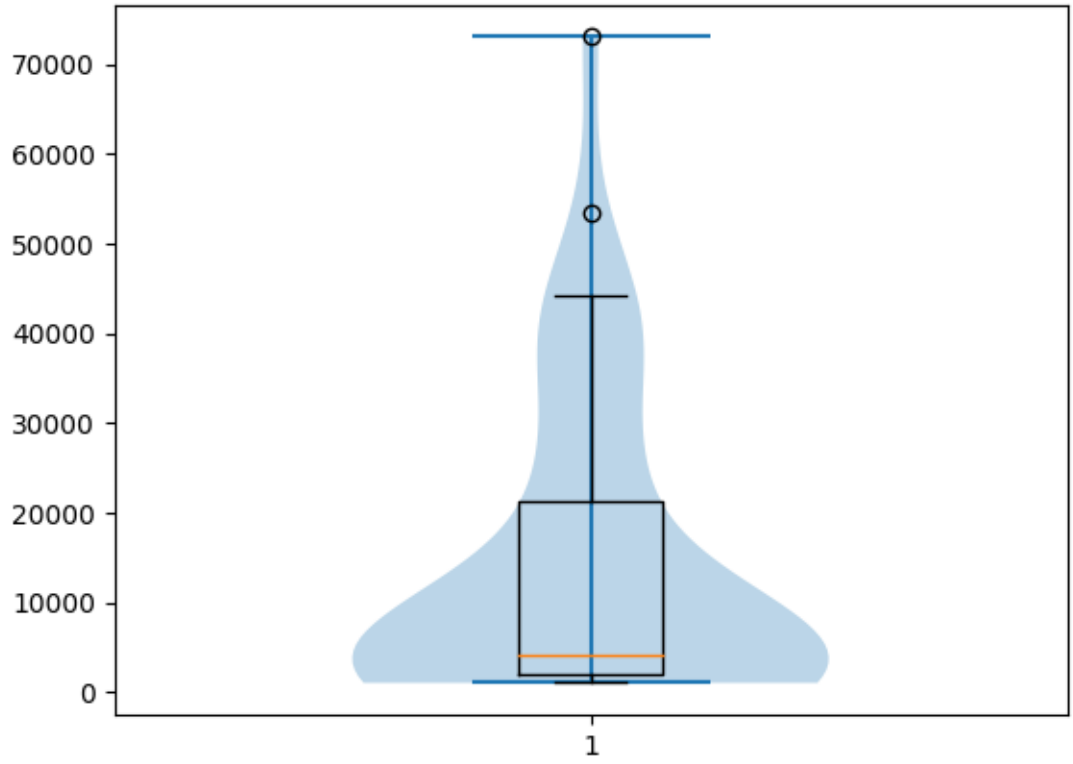

Figure 1
Distribution of Crime Data

STATUS CRIME GROUPS							
1. Adult Arrested			**2. Adult Other**			**3. Unk**	
CRM CD	**COUNT**		**CRM CD**	**COUNT**		**CRM CD**	**COUNT**
230	8308		**626**	14024		**350**	1
626	7348		**624**	13237			
740	4047		**230**	6103			
210	3894		**930**	3866			
310	3837		**236**	3728			
4. Invest Cont.			**5. Juvenile Arrested**			**6. Juvenile Other**	
CRM CD	**COUNT**		**CRM CD**	**COUNT**		**CRM CD**	**COUNT**
510	67889		**210**	410		**624**	386
354	43567		**230**	369		**230**	57
330	41763		**624**	273		**930**	50
310	36671		**740**	112		**442**	50
624	36210		**510**	93		**860**	42

Table 1

Criminal Case Processing

Questions expected to be answered:

Q. Are certain crimes more likely to be solved or result in arrests than others?

From the table 1, we can observe how the criminal case proceeding have been throughout the year for each individual proceeding type. I have taken only the top 5 crimes for each proceeding as they will give an easy indication for the whole type.

From part 1 of table 1, we can infer that these types of crimes are prevalent among adults and that law enforcement agencies are actively pursuing and arresting the suspects. The high occurrence of ***assault***, ***felony*** of $400 or more, ***robbery***, and ***burglary*** cases also suggests that there may be underlying socio-economic factors that contribute to these crimes.

From part 2 of table 1, we can infer that in these cases, the law enforcement officials may have chosen to resolve the situation without making an arrest as these cases include crimes such as ***simple assault***, ***aggravated assault*** and ***criminal threats***. It is possible that they used alternative methods such as mediation or counselling to address the situation. Alternatively, the convict may have turned themselves in voluntarily, or the authorities may have decided that an arrest was not necessary given the circumstances of the crime.

From part 3 of table 1, we can see one of the outliers of the data or rather outlier of nature as it is one-of-a-kind case which is not very helpful in analysis.

From part 4 of table 1, upon examining the crime data, it is evident that the majority of cases are currently in an "investigation continued" status. This raises questions about the efficiency and effectiveness of the law enforcement and court system. Specifically, it could suggest a lack of prompt police action or delays in the court proceedings. Notably, the crimes that are

most commonly associated with this status include ***stolen vehicle*** or ***valuable items***, ***theft*** of ***identity***, and ***burglary***.

From part 5 of table 1, analyzing the cases where juveniles have been arrested for specific criminal cases, we observe that the crimes include ***robbery***, ***aggravated assault***, ***vandalism***, and ***stolen vehicles***. This may indicate a need for increased focus on prevention and intervention programs for at-risk youth to address the root causes of such criminal behaviour. It is also important to ensure that the juvenile justice system is providing appropriate rehabilitation and support to help these young individuals become productive members of society.

At last, from part 6 of table 1, this section highlights the relatively lower number of cases involving juvenile offenders that have been processed through means other than arrest. These cases primarily involve offenses such as ***assault***, ***criminal threats***, ***shoplifting***, and ***battery***. While the number of cases in this category is lower than others, it is important to note that these crimes can still have a significant impact on the victims and the community. It may also suggest that law enforcement and the justice system are taking proactive measures to divert juvenile offenders away from the criminal justice system, where appropriate.

Questions expected to be answered:

Q. Do certain types of crimes tend to be more or less severe than?

Now taking a look at table 2, it gives a brief description how weapons are related some specific crimes. From the dataset we can clearly see that not all the crimes include any weapon usage but majority does, ***235771*** number of cases include weapon usage to be exact.

Now for analysis I have taken all the weapon categories which have a cumulative count of more than ***17000***. This gives us ***13*** categories which makes ***93.7***% of the whole cases.

For the first row of weapon types, these includes fire arms such as ***pistol***, ***shot guns***, ***semi-automatic firearms***. Due to the less restrictive laws for firearms bearing in the USA we can see that number of cases including firearms are on average higher than any other country, specifically for semi-automatic and automatic types of firearms.

In the next row, weapons that result in blunt force attack are included for example ***thrown object*** like rock or brick, ***vehicle hit*** and ***metal pipe hit***. These are relatively less in count.

The next row shows the cases with sharp edged weapon like ***knives*** and ***broken bottle*** which are relative to aggravated assault, threats and brawls, generally occurring near bars, pubs and casinos, indicating the usage on high value targets with wealthy possessing.

The last set of groups are related to the most common types of violence that is ***melee*** or ***hand to hand fighting***, ***verbal abuse*** and ***pepper sprays*** (generally used for self-defence). As most

people don't carry any weapon on them every time, general crime occurs in this category. The numbers also back up this assumption as melee makes up for almost ***51.8%*** of cases that include some or the other kind of combat engagement.

Weapon-Crime Relation								
102-Hand Gun			**106-Unknown Firearm**			**109-Semi-Automatic Pistol**	
Crm Cd	Count		**Crm Cd**	Count		**Crm Cd**	Count
230	5517		**230**	2201		**230**	2334
210	4242		**753**	738		**210**	1472
761	1891		**251**	668		**761**	500
753	738		**210**	387		**753**	286
220	481		**761**	278		**110**	180
306-Thrown Object			**307-Vehicle**			**312-Pipe Metal**	
Crm Cd	Count		**Crm Cd**	Count		**Crm Cd**	Count
740	520		**230**	1769		**230**	1104
230	503		**236**	281		**210**	144
624	231		**210**	69		**740**	143
745	149		**740**	42		**761**	123
310	134		**624**	20		**236**	83
200-Knife			**207-Other Knife/Blades**			**212-Bottle**	
Crm Cd	Count		**Crm Cd**	Count		**Crm Cd**	Count
230	1916		**230**	1724		**230**	1093
761	1483		**761**	1204		**236**	194
210	803		**210**	662		**210**	107
236	294		**236**	259		**740**	94
220	191		**220**	156		**624**	55
400-Melee			**500-Unkown Weapon**			**511-Verbal Threat**	
Crm Cd	Count		**Crm Cd**	Count		**Crm Cd**	Count
624	48162		**230**	4310		**930**	12785
626	32432		**624**	4094		**210**	983
210	10186		**310**	3354		**761**	842
236	5531		**330**	1986		**956**	342
230	5103		**626**	1434		**940**	214
			512-Mace/Pepper Spray				
			Crm Cd	Count			
			230	1952			
			210	333			
			236	191			
			220	46			
			624	23			

Table 2
Weapon-Crime Relation

4.2 Analysis using Visualization

Visualizations are a critical component of crime data analysis, as they provide an effective way to communicate complex information in a clear and concise manner. Crime data can be vast and complex, and visualizations help to distil this information into meaningful insights and patterns that can be easily understood.

Visualizations also allow for the identification of trends and patterns in crime data that may not be immediately apparent from the raw data. For example, a map of crime incidents in a particular area can help to identify high-crime areas and patterns of criminal activity. Similarly, a graph of crime rates over time can reveal long-term trends in criminal activity and highlight areas where law enforcement efforts have been successful or where more attention is needed.

Moreover, visualizations can help to identify potential biases or anomalies in the data. For instance, if a visualization reveals a disproportionate number of crimes against a particular demographic group, it can indicate the need for further investigation into potential biases or systemic issues.

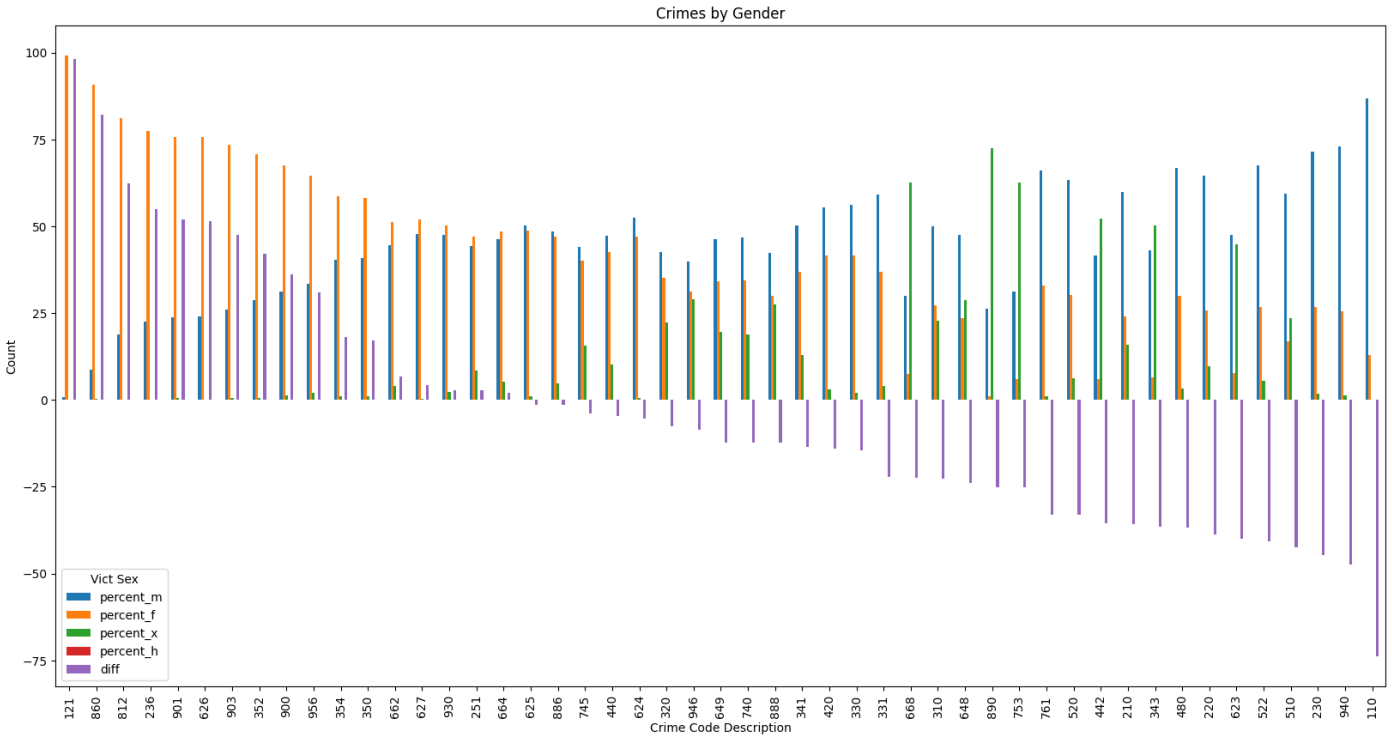

Figure 2
Crimes by Gender

Questions expected to be answered:

Q. Are certain demographic groups (e.g. age, gender, race) more likely to be victims of certain types of crimes?

From figure 2, the extreme ends of the describe crime for female gender on left and male gender on right and from there the difference between them decreases until minimal in the middle. This graph indicates that some crimes are targeted to one specific gender more than the other.

In case of crimes that have more female victims, it includes ***121:"RAPE, FORCIBLE", 860: BATTERY WITH SEXUAL CONTACT, 812: CRM AGNST CHLD (13 OR UNDER) (14-15 & SUSP 10 YRS OLDER).*** This insight suggests that generally females are subject to sexual harassment and battery.

While on the other hand, for male counterparts the suffer from ***110: CRIMINAL HOMICIDE, 940: EXTORTION, 230: "ASSAULT WITH DEADLY WEAPON, AGGRAVATED ASSAULT"***. Therefore, males are more prone to fall victim of a deadly and violent crime than women.

In the middle of the pack we can observe crimes like ***946: BIGAMY*** (Extra Marital Affair), ***649: DOCUMENT FORGERY*** and ***740: VANDALISM,*** which are very in-line with their characteristics.

This insight is helpful in suggesting the law makers, executives and police to increase vigilance for these specific crimes for each gender respectively.

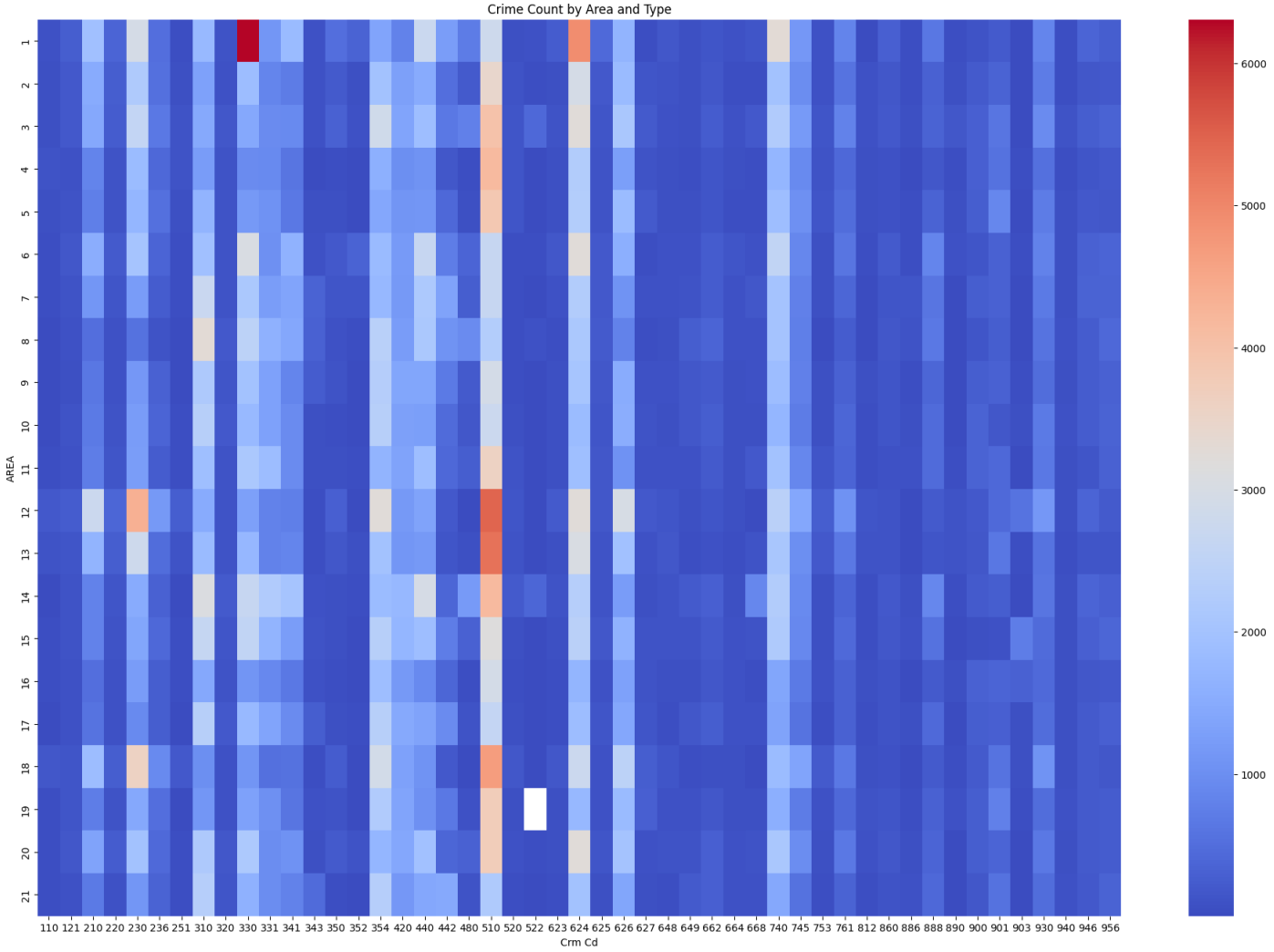

Figure 3

Area wise crime frequency

Questions expected to be answered:

Q. Are there any specific neighbourhoods or areas within a city or region that have higher crime rates than others?

Q. Are there any patterns or trends in the timing or location of certain crimes?

From figure 3, we can see the distribution of the crimes in each Area code in the city of Los Angeles. It is observable that crime ***510: VEHICLE STOLEN*** is the most frequent crime out of all the other crimes in each sector followed by ***624: BATTERY - SIMPLE ASSAULT***. Area 12 and 13 see a shared average max of around 5100 in each for the same indicating it as an office or public place where vehicle is left unattended for and generally get stolen. Next, we can also see some random spikes of frequency in various crimes of various areas. The most prominent of all is ***330: BURGLARY FROM VEHICLE*** in AREA 1, where its frequency is approximately at 6200. This begs for the need of increased surveillance in the area and more vigilantism. Apart from that there are various spikes like ***625: OTHER ASSAULT*** in AREA 1, ***230: ASSAULT WITH DEADLY WEAPON, AGGRAVATED ASSAULT*** in AREA 12 and AREA 18.

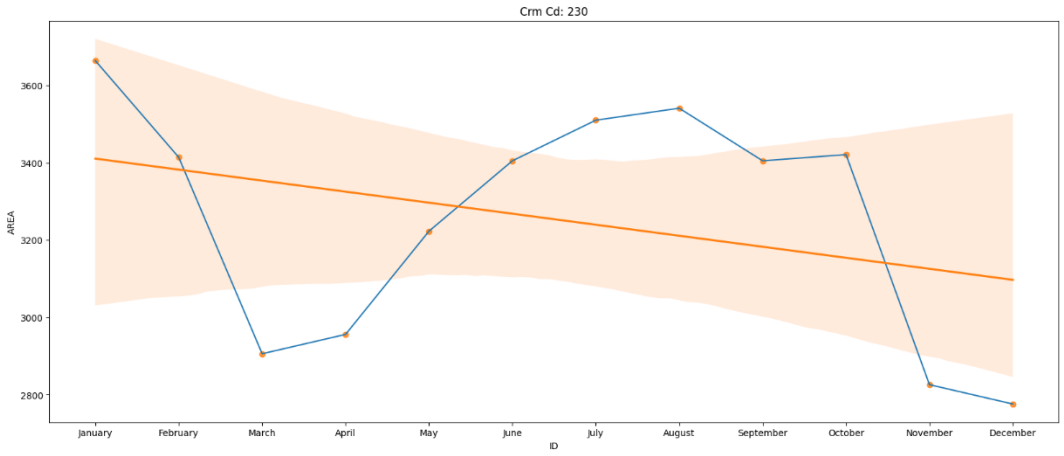

Fig 4.1
Monthly Trend of 230: Assault with deadly weapon

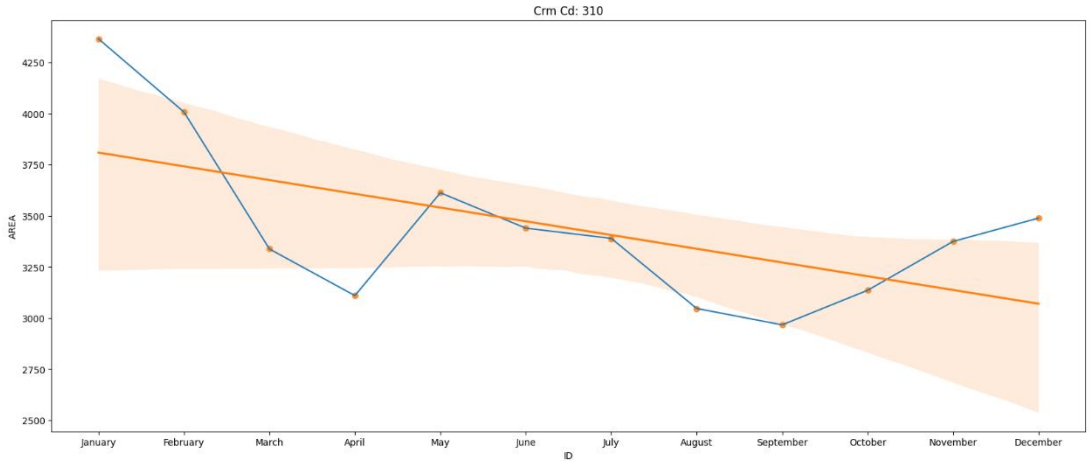

Fig 4.2
Monthly Trend of 310: Burglary

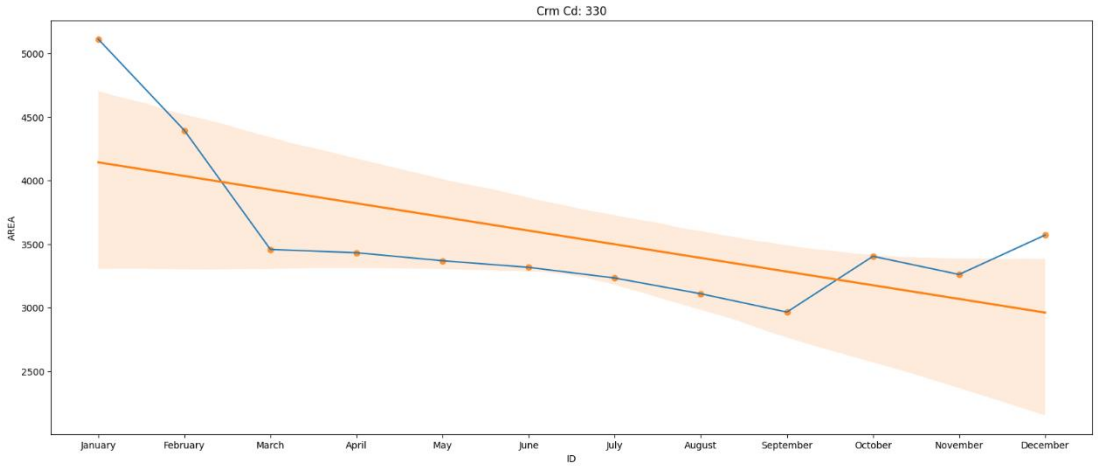

Fig 4.3
Monthly Trend of 330: Burglary from Vehicle

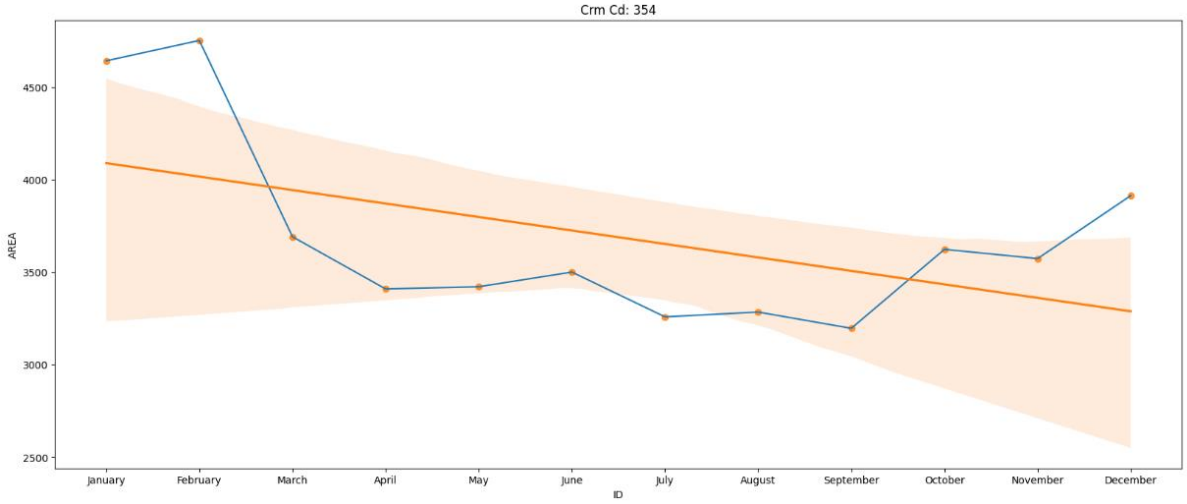

Fig 4.4
Monthly Trend of 354: Theft of Identity

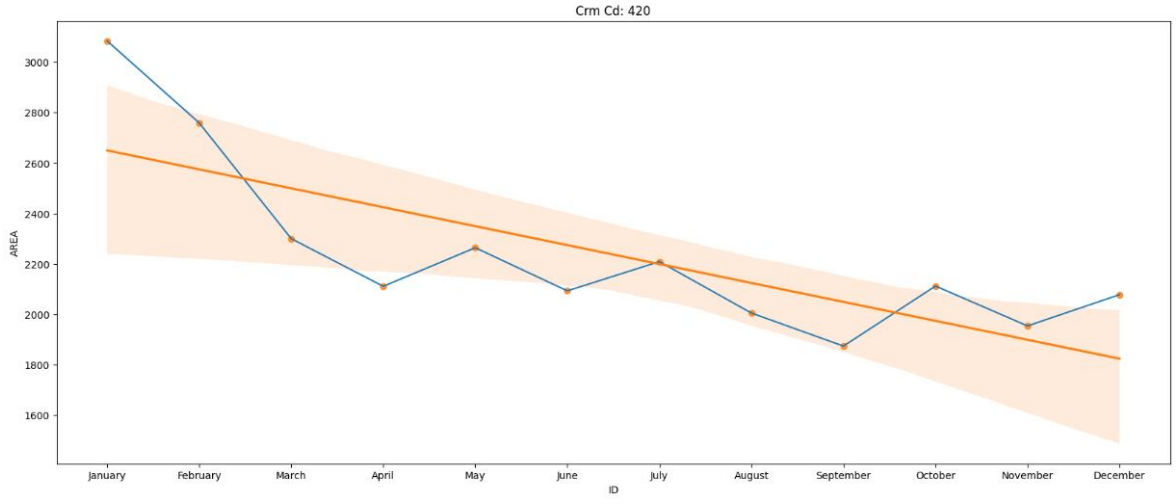

Fig 4.5
Monthly Trend of 420: Theft from Motor Vehicle - Petty ($950 & under)

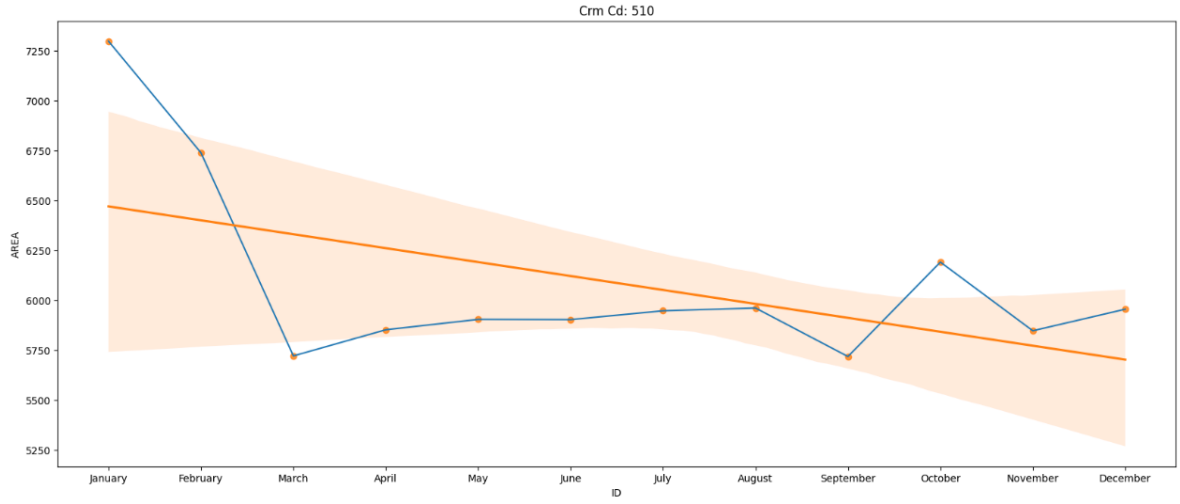

Fig 4.6
Monthly Trend of 510: Vehicle - stolen

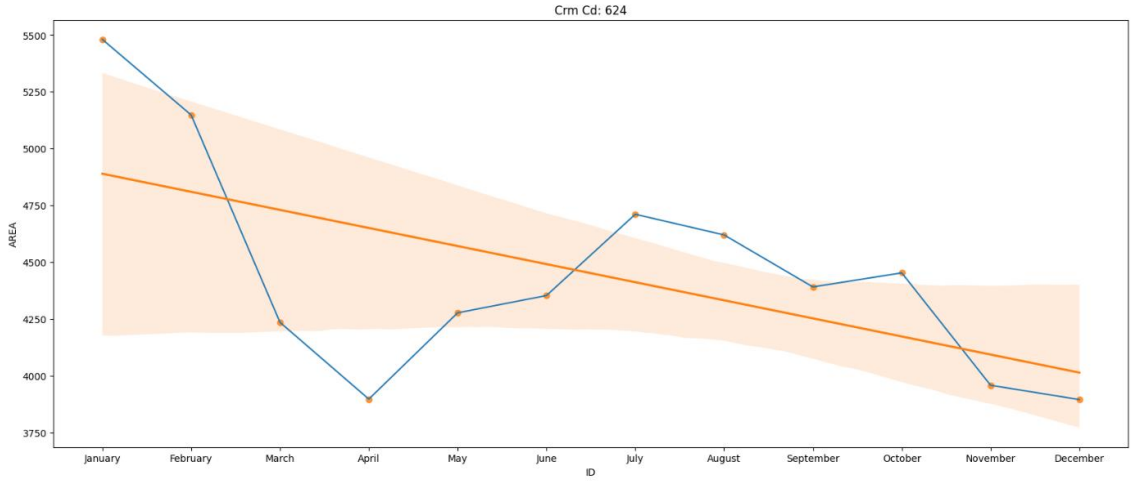

Fig 4.7
Monthly Trend of 624: other assault

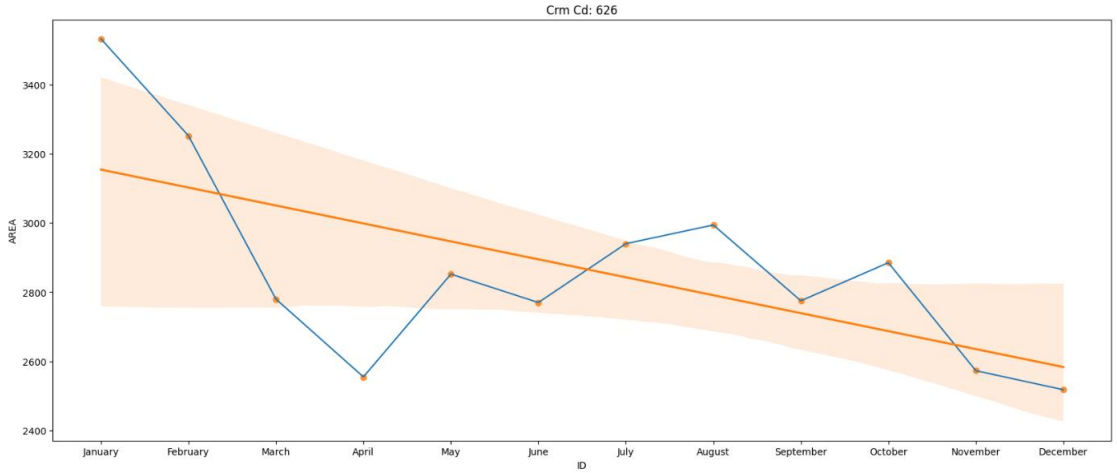

Fig 4.8
Monthly Trend of 626: Intimate Partner - Simple Assault

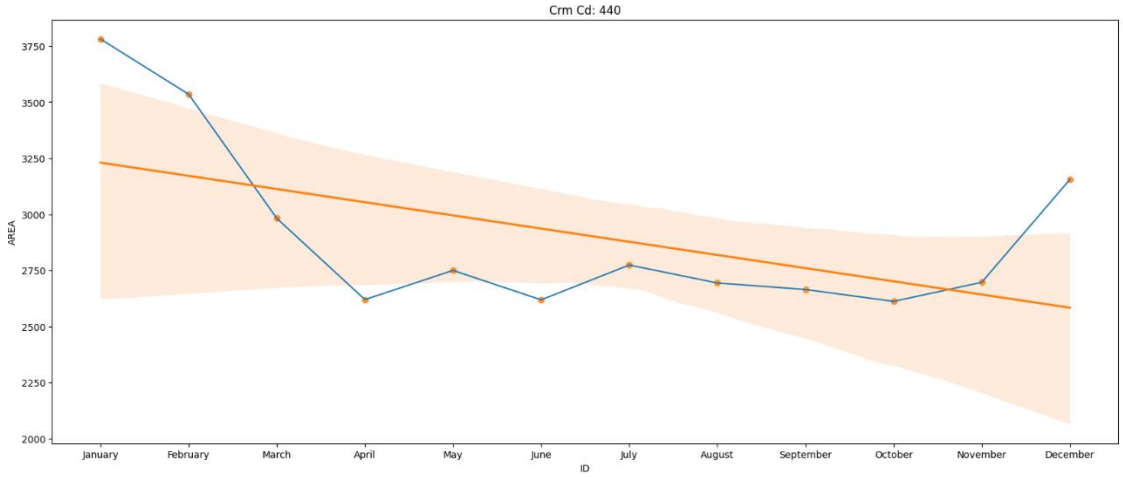

Fig 4.9
Monthly Trend of 440: Theft Plain - Petty ($950 & under)

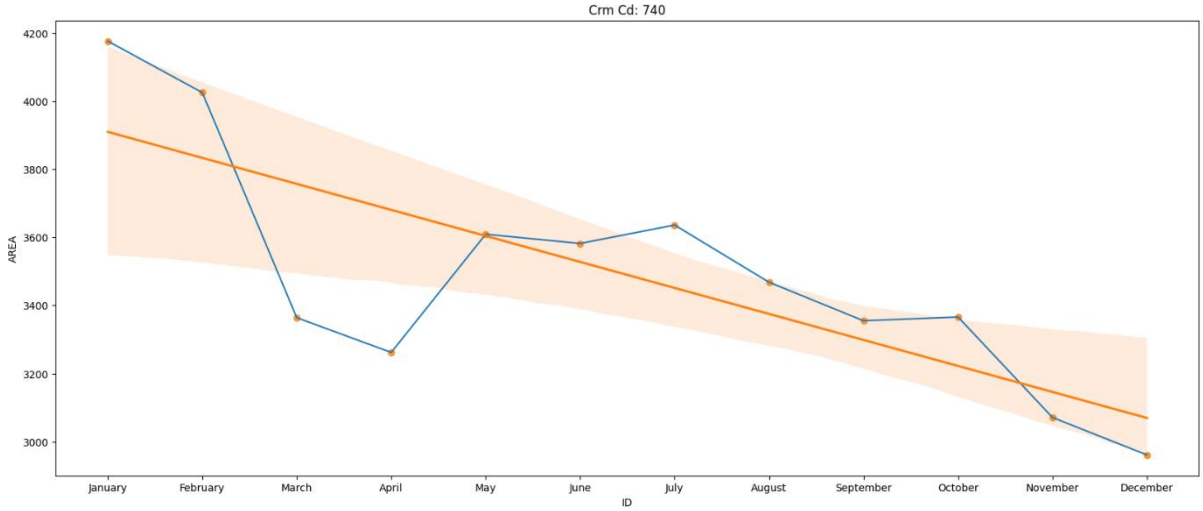

Fig 4.10
Monthly Trend of 740: vandalism - felony ($400 & over, all church vandalisms)

Questions expected to be answered:

Q. How has the rate of certain crimes (e.g. robbery, burglary, assault) changed over time?

Q. Are there any seasonal patterns in crime rates (e.g. more crimes committed during the summer months)?

The figure above that is from 4.1 to 4.10 show the monthly trend of top 10 most frequent crime cases. These cases are generally divided into two categories burglary (***fig 4.2, 4.3, 4.4, 4.5, 4.6, 4.9, 4.10***) and assault (***fig 4.1, 4.7, 4.8***). We can observe that all the crimes have a downward trend through the year with spikes around the months of July, August and October.

From the ***fig 4.1, 4.7*** & ***4.8***, upon analyzing the assault-related crimes, a recurring trend can be observed where the frequency of such crimes declines during the first quarter of the year, followed by a subsequent rise. This decline could possibly be attributed to the post-holiday season lull and a general lack of enthusiasm among people. However, as the year progresses, the number of assault cases gradually increase, with peak values generally observed in either August or October. This uptick in assault crimes could possibly be attributed to the onset of the festive season, leading to heightened emotions and incidents of aggression.

From the ***fig 4.2, 4.3, 4.4, 4.5, 4.6,*** & ***4.9*** it is noticeable that the occurrences of burglary and theft crimes increase during the onset and conclusion of the year, particularly during the

holiday season, which is a time when individuals tend to purchase new items for themselves or as gifts. This is typically when the highest number of burglary incidents take place, highlighting a potential link between the holiday season and an increased risk of theft or burglary. While it is true that the holiday season can lead to an increase in theft and burglary, there could be other factors at play as well, such as increased darkness during the winter months or an increase in property values due to the real estate market.

5. Conclusion

In summary, the analysis of crime data in the Los Angeles area has provided valuable insights into the types of criminal activities that are more prevalent, their seasonal trends, and the differences in legal proceedings taken against adult and juvenile offenders. The study found that theft, burglary, and vandalism were the most common crimes reported in the area, with a clear increase in the number of incidents during the holiday season. This rise in criminal activity during the holiday season can be attributed to the increase in consumer spending, with people buying new products for themselves or as gifts.

Interestingly, assault and robbery showed a trend of decreasing in frequency in the first quarter of the year, likely due to the winter weather and people spending more time indoors. However, as the year progresses, the frequency of these crimes starts to rise again, peaking in either August or October.

The analysis also revealed that cases involving juvenile offenders were more likely to result in other proceedings besides arrest, such as diversion or community service. This may indicate that the criminal justice system is taking a more rehabilitative approach towards young offenders. In contrast, adult offenders were more likely to be arrested and have formal charges filed against them.

Furthermore, the analysis highlighted the different types of crimes committed by adults and juveniles, with assault, felony, robbery, and burglary being the most common crimes leading to arrest for adults, while robbery, aggravated assault, vandalism, and stolen vehicles were the most common crimes leading to arrest for juveniles. Meanwhile, both adults and juveniles had the highest number of cases where proceedings were other than arrest for crimes such as assault, criminal threats, and shoplifting.

These findings can be valuable to law enforcement agencies and policymakers, as they can help them take necessary measures to prevent crime and improve public safety. For example, policymakers could consider increasing police presence during the holiday season to deter theft and burglary. Moreover, they could evaluate the effectiveness of current rehabilitation programs for juvenile offenders and consider implementing similar programs for adult offenders. Overall, the analysis provides a useful snapshot of the crime trends and patterns in the Los Angeles area, which can inform crime prevention strategies and efforts to improve the criminal justice system.

6. Future Work

Based on the findings of this crime data analysis, there are several potential areas for future research in the field of analysis.

One possible avenue for further study could be to explore the underlying factors that contribute to the seasonal trends observed in different types of crimes. For example, what specific factors during the holiday season make theft and burglary more likely to occur? A deeper understanding of the root causes of these seasonal trends could help inform targeted prevention efforts and resource allocation by law enforcement agencies and policymakers.

Another potential area for future work could be to investigate the effectiveness of different legal proceedings in reducing crime and recidivism rates among adult and juvenile offenders. For instance, are diversion and community service programs effective in reducing recidivism among juvenile offenders? Are formal charges and arrests effective in reducing crime rates among adult offenders? Answering these questions could help identify best practices in the criminal justice system and lead to more effective and efficient use of resources.

In addition to the potential future work mentioned above, there are several other areas where further analysis could be conducted based on the findings of this study.

- First, it may be interesting to investigate the relationship between crime rates and socioeconomic factors such as poverty, unemployment, and education level. Understanding these relationships could provide insight into the underlying causes of crime in certain areas and potentially inform policy decisions aimed at reducing crime rates.

- Second, the analysis could be expanded to include data from other cities or regions, which would allow for comparisons and a more comprehensive understanding of crime trends on a broader scale. Additionally, including data from multiple years would enable the identification of long-term trends and provide a more robust understanding of crime patterns over time.

Finally, given the rapid advancements in technology and the increasing availability of data, there is an opportunity to further develop and refine analytical tools and techniques for crime data analysis. For example, machine learning algorithms and predictive modelling techniques could be used to identify patterns and trends in crime data that may not be immediately apparent to human analysts. This could help law enforcement agencies and policymakers to more quickly and accurately respond to emerging crime trends and develop more targeted prevention strategies.