

SAS[®] GLOBAL FORUM 2018

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Predicting Crime Incidents in Los Angeles for the Year 2017

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#SASGF

Predicting Crime Incidents in Los Angeles for the Year 2017

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ABSTRACT

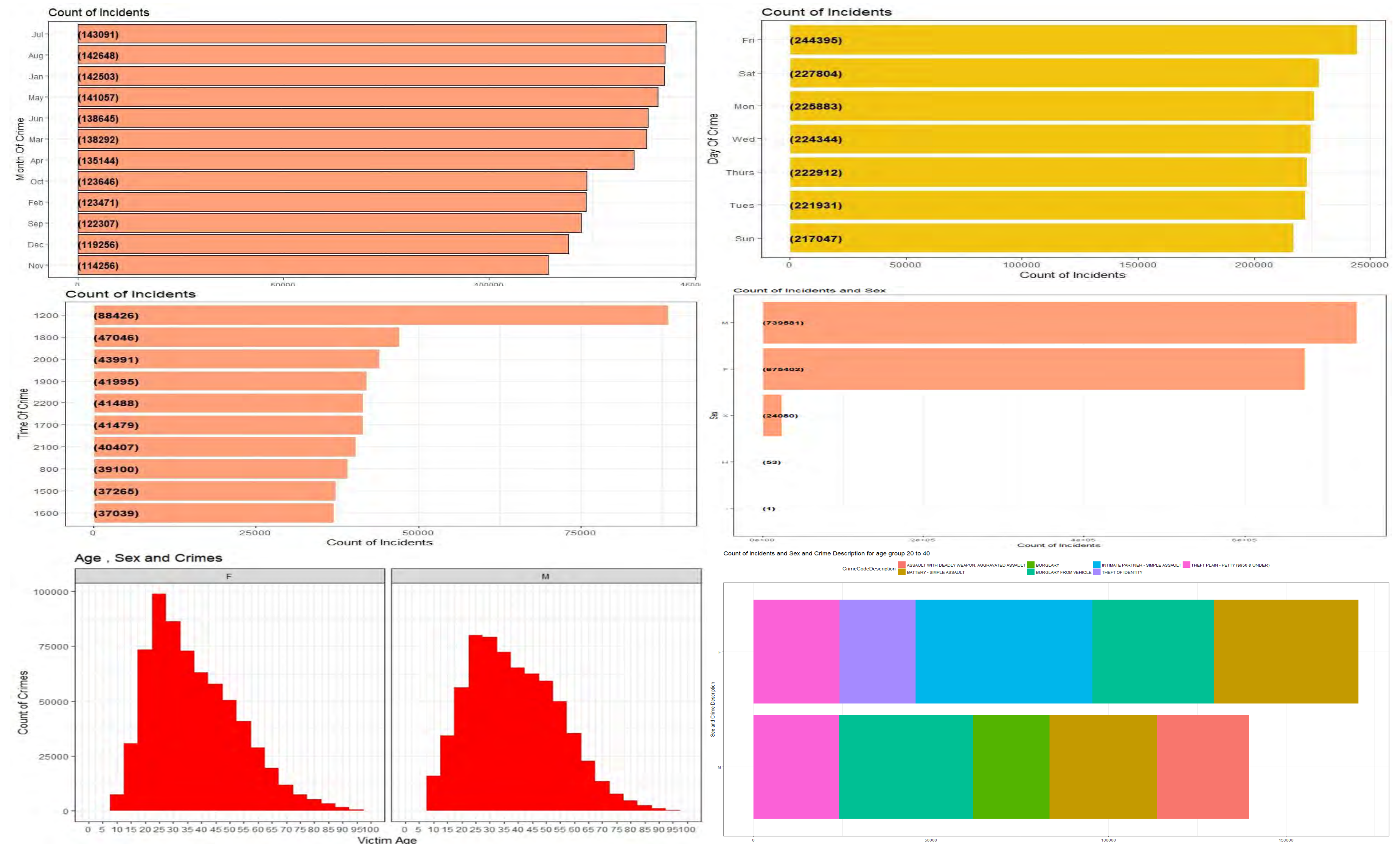
Crime poses a grave threat to the serenity of a city. This threat gets more acute with city population and size. The core objective of this paper is to predict the number of crime incidents for a city using historical crime data and provide insights to law enforcement for predictive policing. For this study, we will be utilizing the historical crime data for the city of Los Angeles, California, USA. The dataset has been publicly made available by the Los Angeles Police Department. It consists of over 1.5 million observations and 26 variables. As part of the exploratory data analysis insights such as the most crime prevalent district- district 363, most commonly used weapon - strong arm (hand fist) and the most common time of crime incident- noon were uncovered. Trend analysis revealed that crime rate has increased after 2014 and the most common crime is Battery - Simple Assault. SAS Enterprise Guide and R have been utilized for data cleaning, exploration and data modeling.

METHODOLOGY



DESCRIPTIVE ANALYTICS: DATA INSIGHTS

- Most crime incidents occur in the month of the July, August & January. November and December experience the lowest crimes.
- Most crimes occur on Fridays and least on Sunday.
- Crimes occur mostly at 1200 hrs.
- More number of males are involved in crime than females
- Most victims are around the age of 20 to 40. Females are more targeted as compared to males in the age group of 20-40.
- Simple Assault and Burglary from Vehicle are the Two Important Crime Types common with age group of 20 to 40.



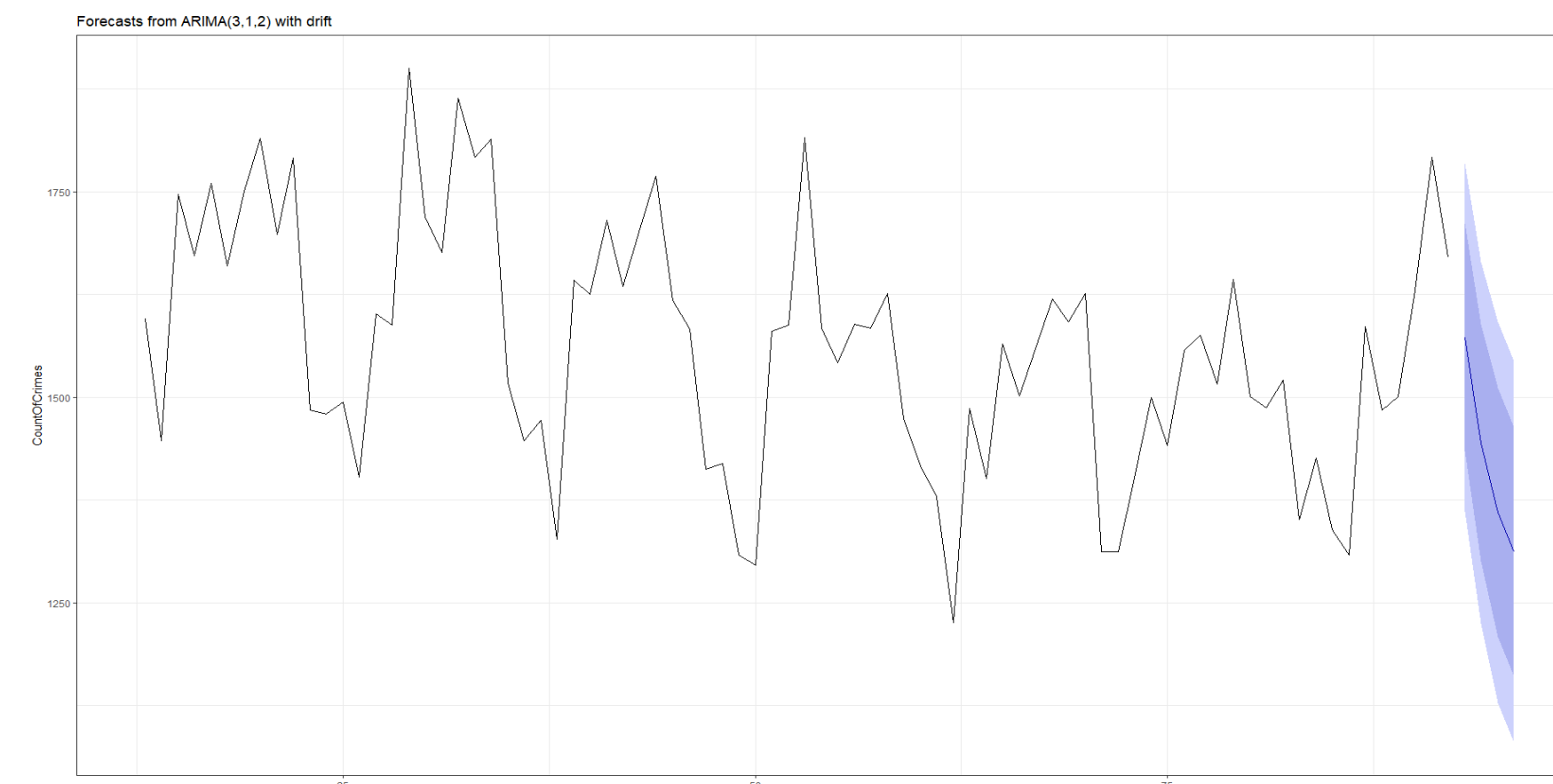
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PREDICTIVE MODELING

- We observe that there are clusters of areas where Crime happens like Burbank, Santa Monica, Rancho Palos Verdes, Redondo Beach have less crimes or no crimes at all.
- Strong-arm, verbal threat, Unknown weapon and Hand Gun are the most common things(weapon) were used at the crime scene.
- Battery - Simple Assault, Vehicle -Stolen, Burglary from Vehicle, Burglary and Theft -Plain Petty are Top 5 most common crimes.
- Trends of Crime from 2010. We can see crime rate has been increasing rapidly after 2014. We also conclude that there is major drop in crime incidents at the end of the first month every year.
- Trend of the Crime Battery - Simple Assault from 2010 onwards. We choose this Crime Type since it is the most commonly occurring Crime Type.



Predictions for months of September to December 2017 using **ARIMA**

Months	Predictions
1 September 2017	1573
2 October 2017	1445
3 November 2017	1360
4 December 2017	1312

Predictions for months of September to December 2017 using **ETS**

Months	Predictions
1 September 2017	1688
2 October 2017	1688
3 November 2017	1688
4 December 2017	1688

Predictions for months of September to December 2017 using **Prophet**

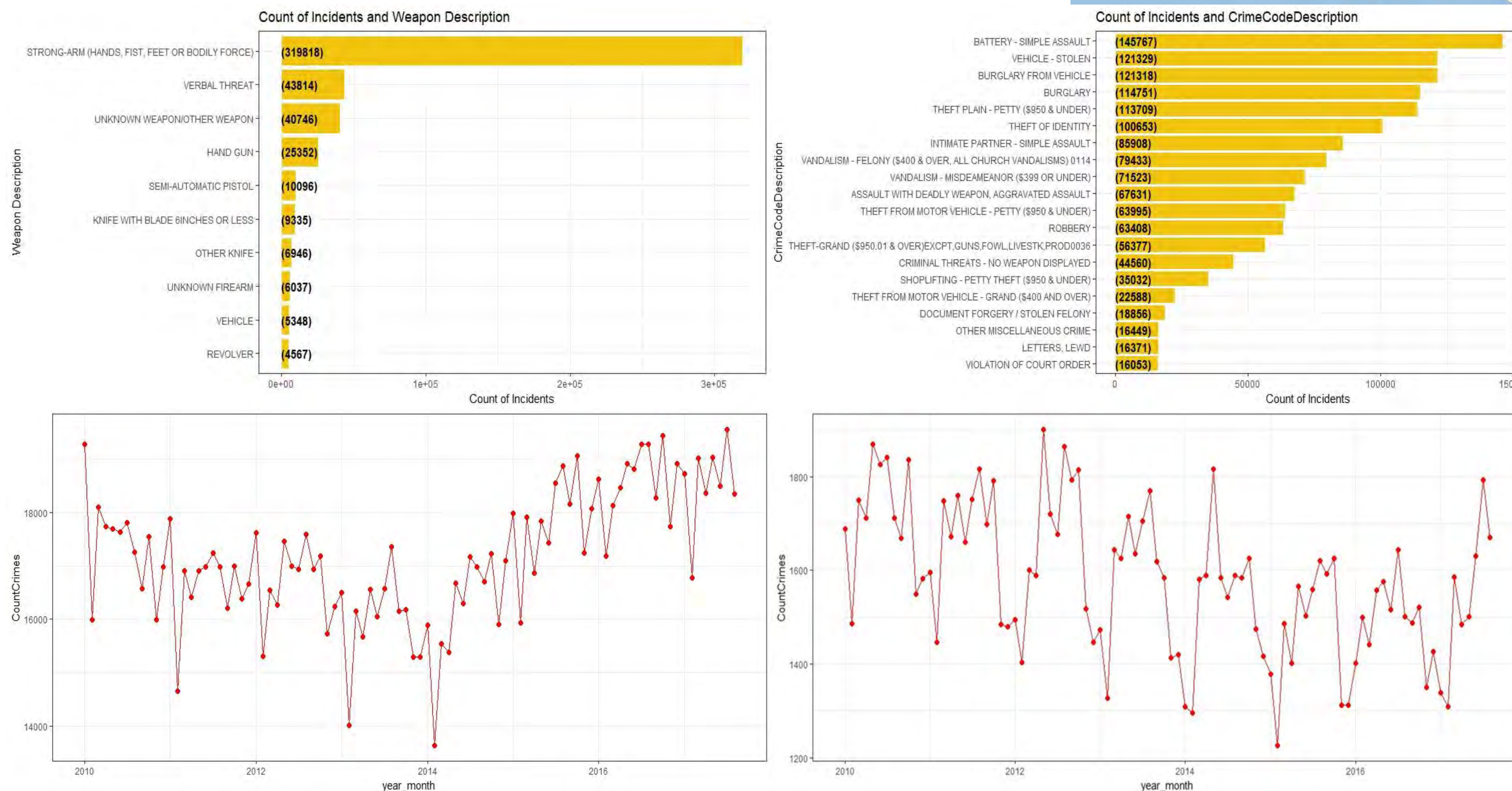
Months	Predictions
1 September 2017	1562
2 October 2017	1608
3 November 2017	1387
4 December 2017	1393

CONCLUSIONS

- Most of the crimes occurs during the month of July, August and January.
- We also discovered there was less crime in the morning and more in the afternoon as well as less crime on Sunday and more crime on Friday.
- We should avoid going into some districts like 363 and 645 which are most prone to crime. Law enforcement officials could possibly bring down their overall crime by cracking down in this districts.
- Stolen Vehicle and Burglary from Vehicle are most common Crime Types in the Street. Theft of Identity and Burglary are most common Crime Types in the Single Family Dwelling.
- Areas like Burbank, Santa Monica, Rancho Palos Verdes, Redondo Beach have less crimes or no crimes at all.
- We hope to explore this data set further for forecasting crime by using forecasting methodologies such simple exponential smoothing models, Holt's smoothing model, additive and multiplicative winter's model will also be explored for accuracy.

REFERENCES

- <https://data.lacity.org/A-Safe-City/Crime-Data-from-2010-to-Present/y8tr-7khq>
- <http://support.sas.com/resources/papers/proceedings17/2022-2017.pdf>
- <https://www.kaggle.com/cityofLA/crime-in-los-angeles>





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