



Spatial and Temporal Trends Analysis of Criminal Activity in LA

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Agenda

- Introduction
- Data Preprocessing
- Visualize Data
- Aggregate Data
- Correlation Analysis



Introduction

- In recent years, the importance of spatiotemporal integration has been increasingly recognized. However, methods for analyzing patterns of association with place and time in crime research remain to be further developed
- Crime has become one of the most striking problems in the United States. This project aims to help us better visualize and understand spatial and temporal trends in criminal activity.



Data source

- The data is from LOS ANGELES OPEN DATA, reflects incidents of crime in the City of Los Angeles dating back to 2020 and updated weekly according to LAPD.

<https://data.lacity.org/Public-Safety/Crime-Data-from-2020-to-Present/2nrs-mtv8>



Data Preprocessing

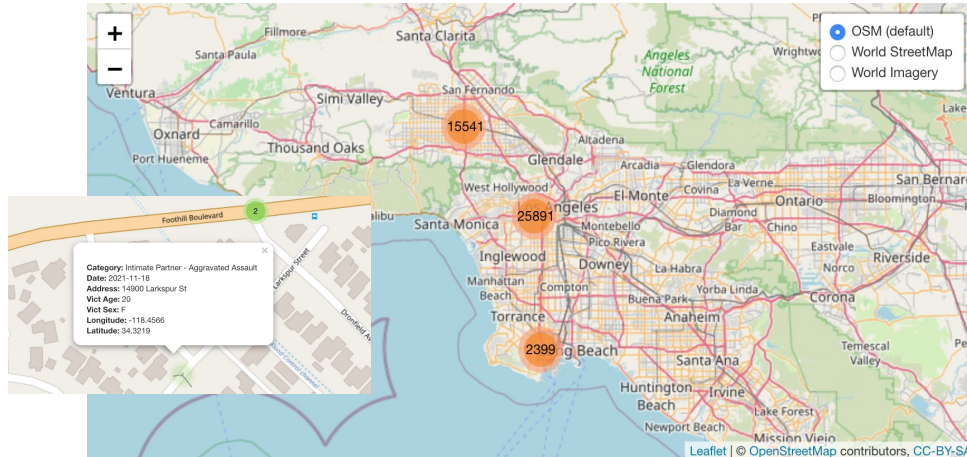
- Select variables concerning crime category, area and time of the incidents, description of victims, and so on, each row represents a crime incident
- Clean the text content and prepare it for further analysis
- Select the crime that have finished the investigation, and the crime category that happened more than 500 times in the past

Data Preprocessing

	DR_NO	Date.Rptd	TIME.OCC	AREA	AREA.NAME	Rpt.Dist.No	Crm.Cd.Desc	Mocodes
1	10304468	01/08/2020 12:00:00 AM	2230	3	Southwest	377	Battery - Simple Assault	0444 0913
21	200100559	01/23/2020 12:00:00 AM	600	1	Central	111	Burglary	1402 1822 1414 0344
33	200407198	03/22/2020 12:00:00 AM	430	4	Hollenbeck	466	Intimate Partner - Simple Assault	2000 0913 0416 1813 1243
66	200104098	01/02/2020 12:00:00 AM	1240	1	Central	154	Robbery	2004 0913 0344 0334 0302 1402 1202
78	200104140	01/02/2020 12:00:00 AM	2145	1	Central	192	Intimate Partner - Simple Assault	2000 1813 0416 1414 1276 0417

Visualize Data

Crime across space

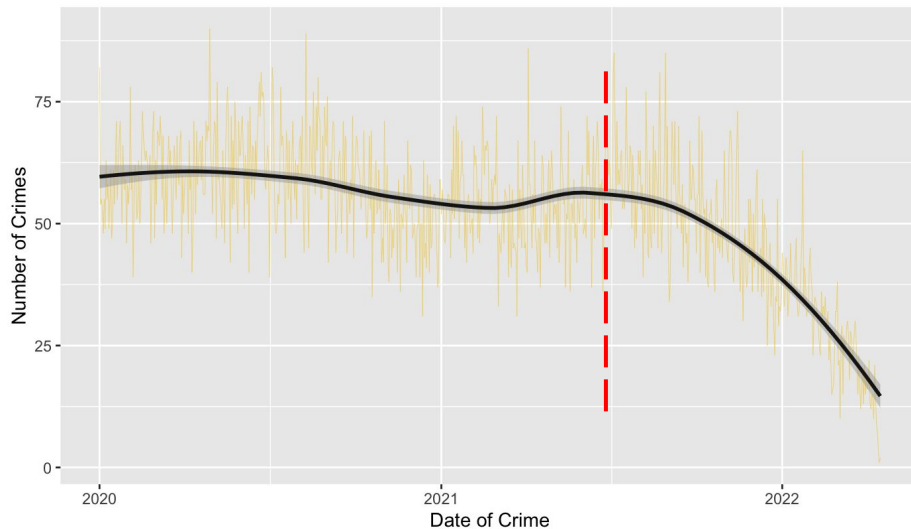


- Based on the map of Leaflet, we are able to see the distribution of crime incidents in LA.
- Total: 43831
- Popup:
 - Category
 - Date
 - Address
 - Vict Age
 - Vict Sex
 - Longitude
 - Latitude

Visualize Data

Crime Over Time

Daily Crimes in Los Angeles from 2020 – Present

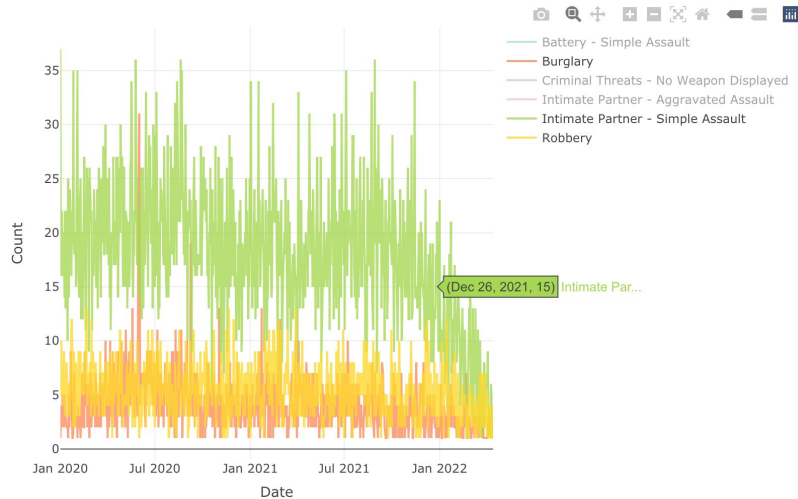


- Overall Trend:

- Through July 2021, Los Angeles has an annual daily crime count of about 60.
- In the first few months of the pandemic, the number of crimes dropped notably from end of 2021.
- The number of Daily Crimes decreased by almost 78%.

Visualize Data

Crime Over Time



- The Crime Category includes Battery, Burglary, Intimate Partner, Robbery, and Criminal Threats.
- Due to pandemic, although the number of burglary and robbery decreased significantly, the number of Crime between intimate partner increased dramatically.



Aggregate Data

Top 6 Crimes

Show entries

Search:

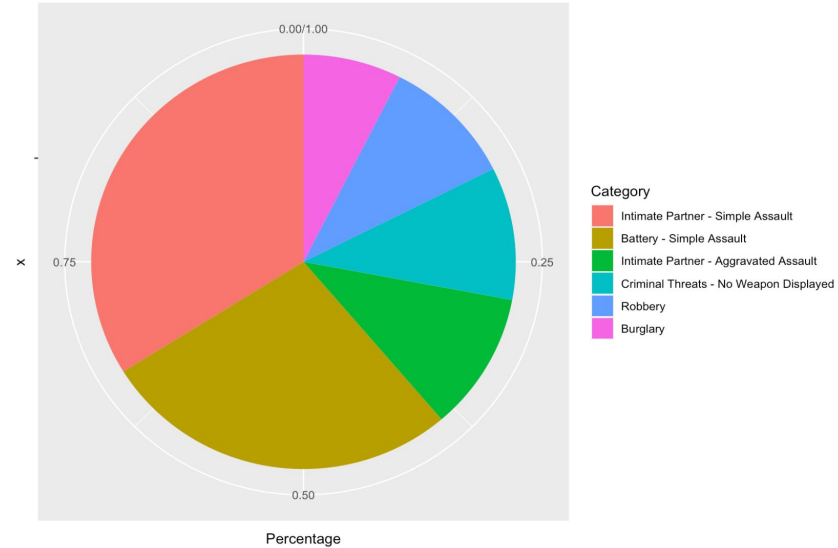
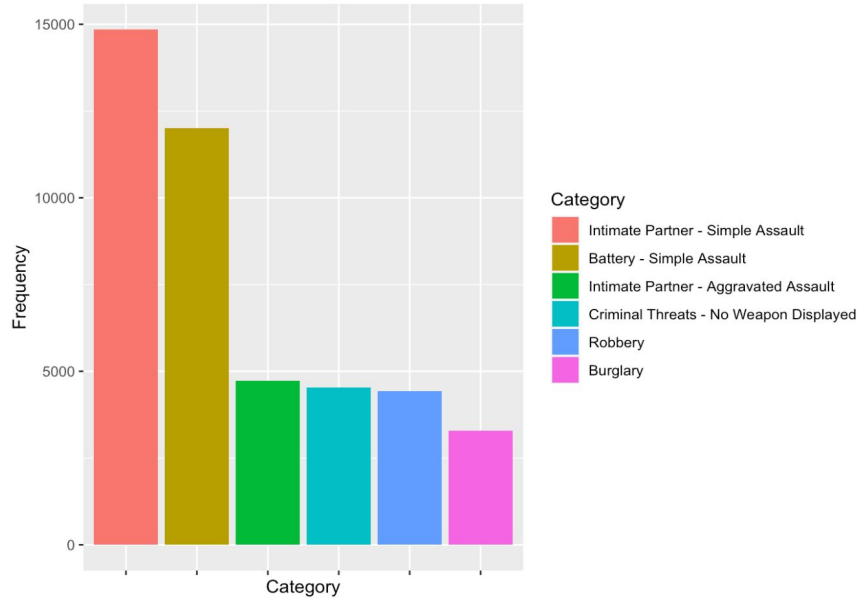
	Category	Frequency	Percentage
1	Intimate Partner - Simple Assault	14852	0.338823744125565
2	Battery - Simple Assault	12002	0.273805721585983
3	Intimate Partner - Aggravated Assault	4728	0.107861477391979
4	Criminal Threats - No Weapon Displayed	4539	0.103549755897249
5	Robbery	4434	0.101154355066843
6	Burglary	3279	0.0748049459323813

Showing 1 to 6 of 6 entries

Previous Next

Aggregate Data

Top 6 Crimes

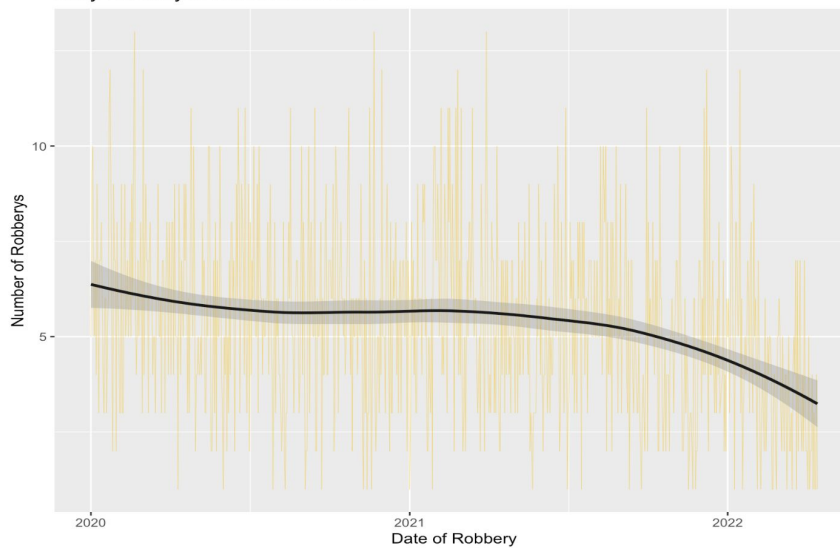


- Intimate partner violence
 - Simple assault (1st)
 - Aggravated assault (3rd)
- Battery (2nd)
 - damaging or offensive contact with another person without that person's agreement

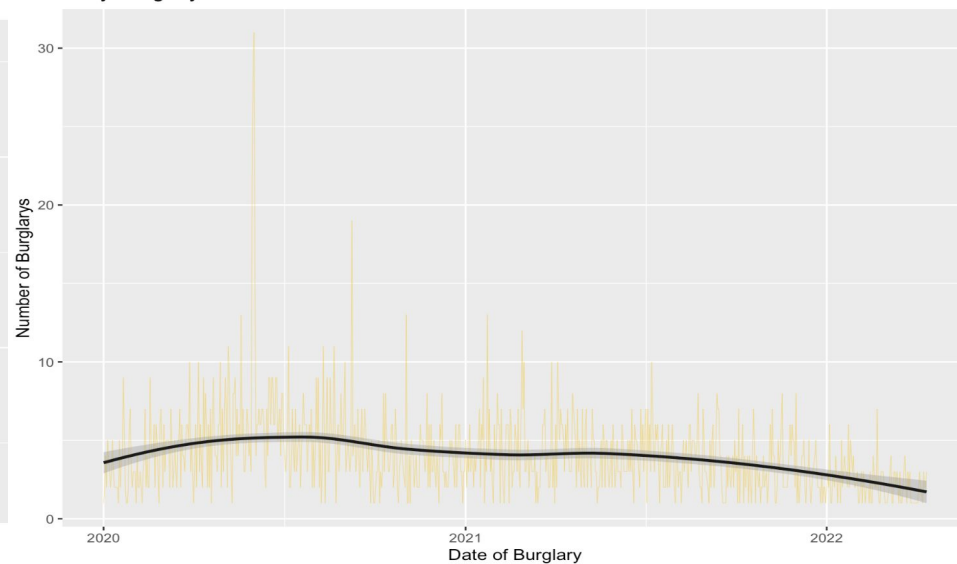
Temporal Trends

Robbery vs. Burglary

Daily Robberies From 2020 to 2022

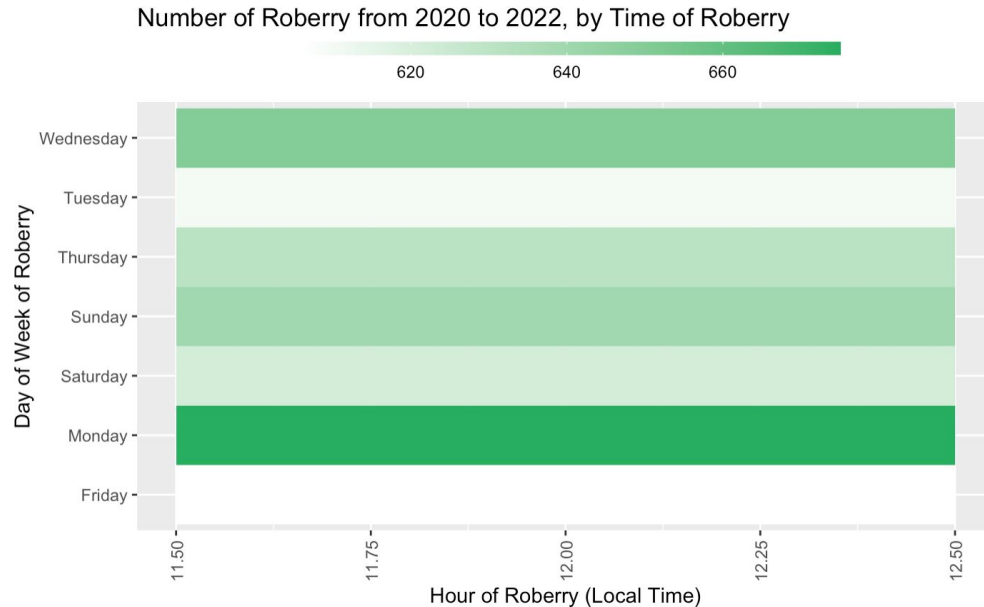


Daily Burglaries From 2020 to 2022



Temporal Trends

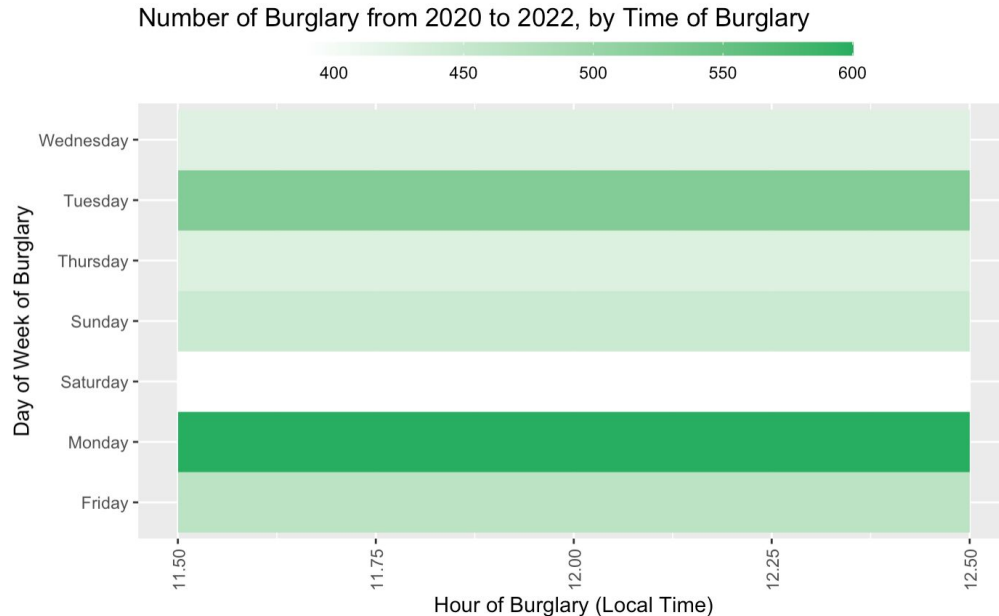
Robbery vs. Burglary



- Robbery
 - Someone steals anything of value directly from another person using force or terror
 - Mondays - highest
 - Fridays - lowest

Temporal Trends

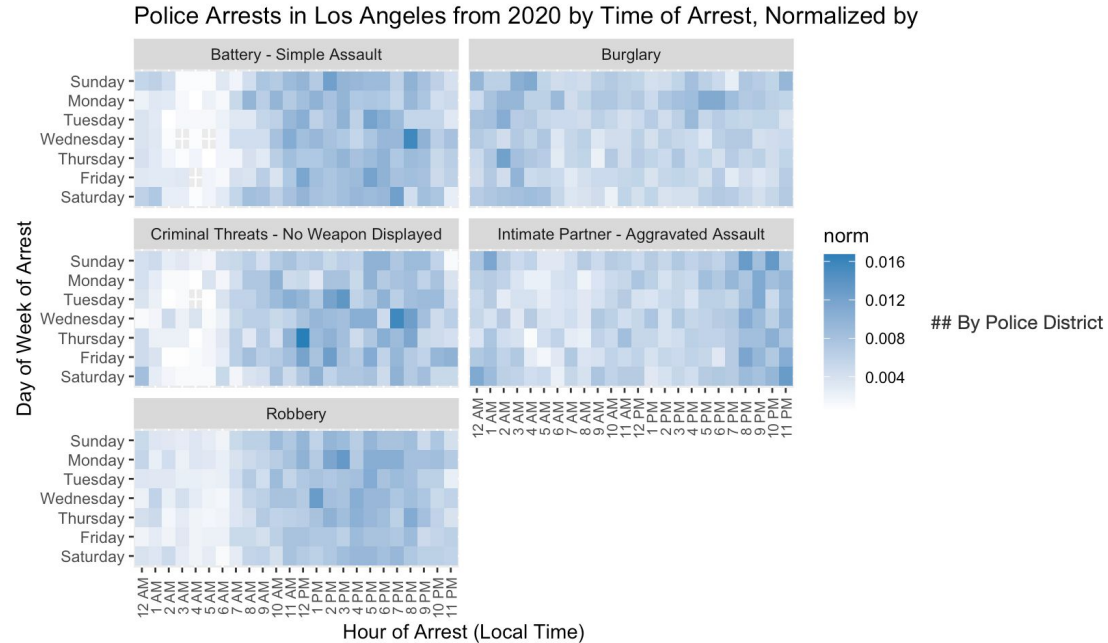
Robbery vs. Burglary



- Burglary
 - Someone illegally enters a building in order to conduct a crime while inside
 - Mondays - highest
 - Saturdays - lowest

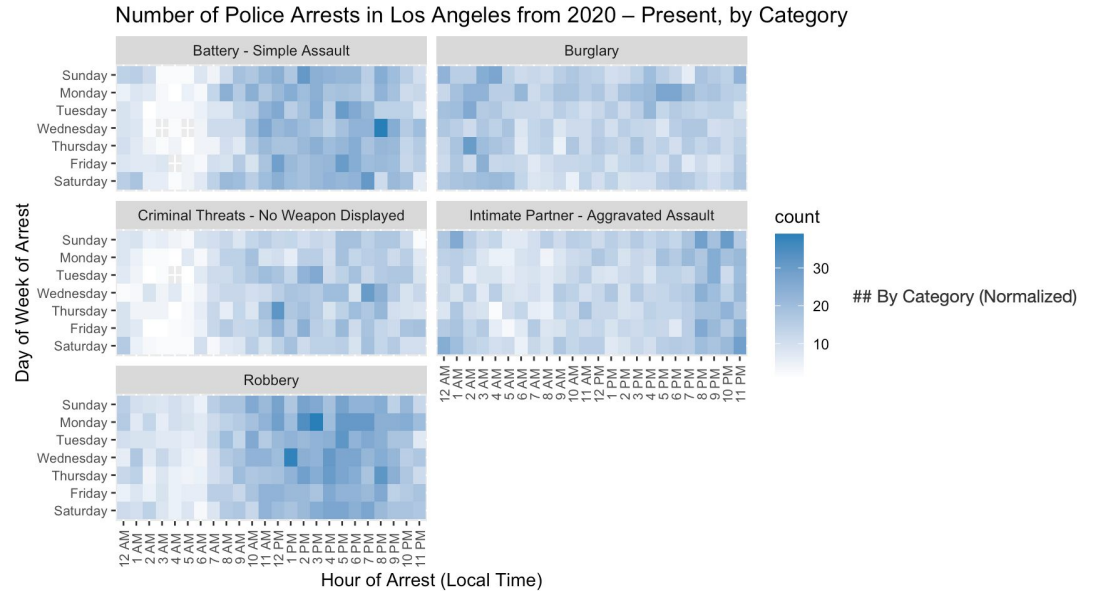
Correlation Analysis

Factor By Crime Category



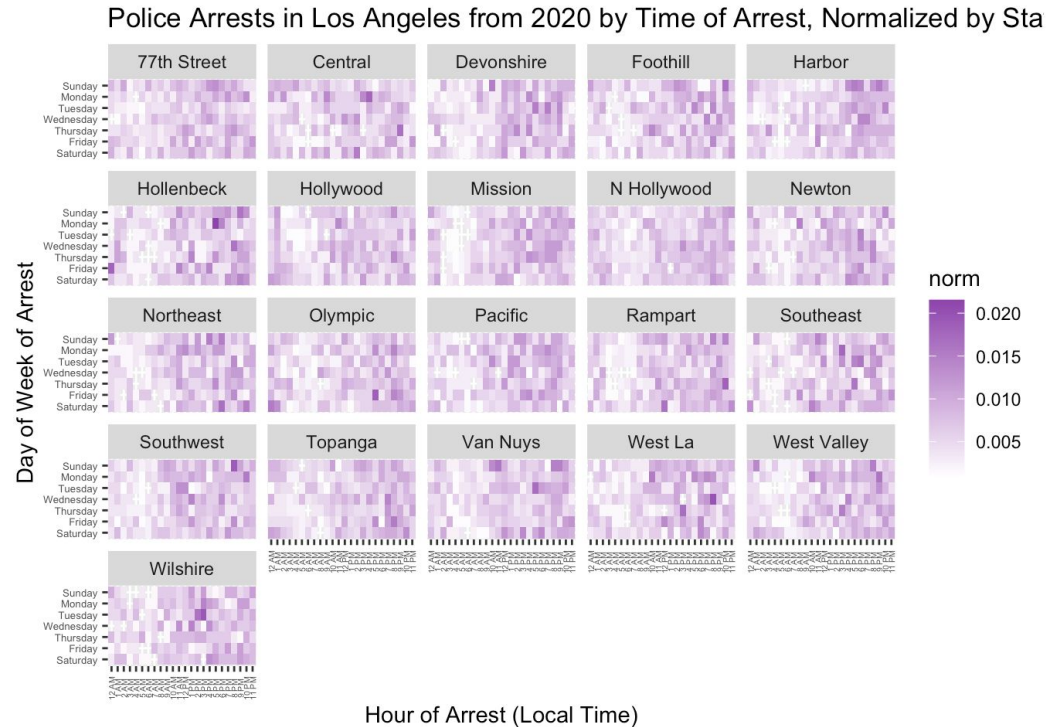
Correlation Analysis

Factor By Crime Category
(Normalized)



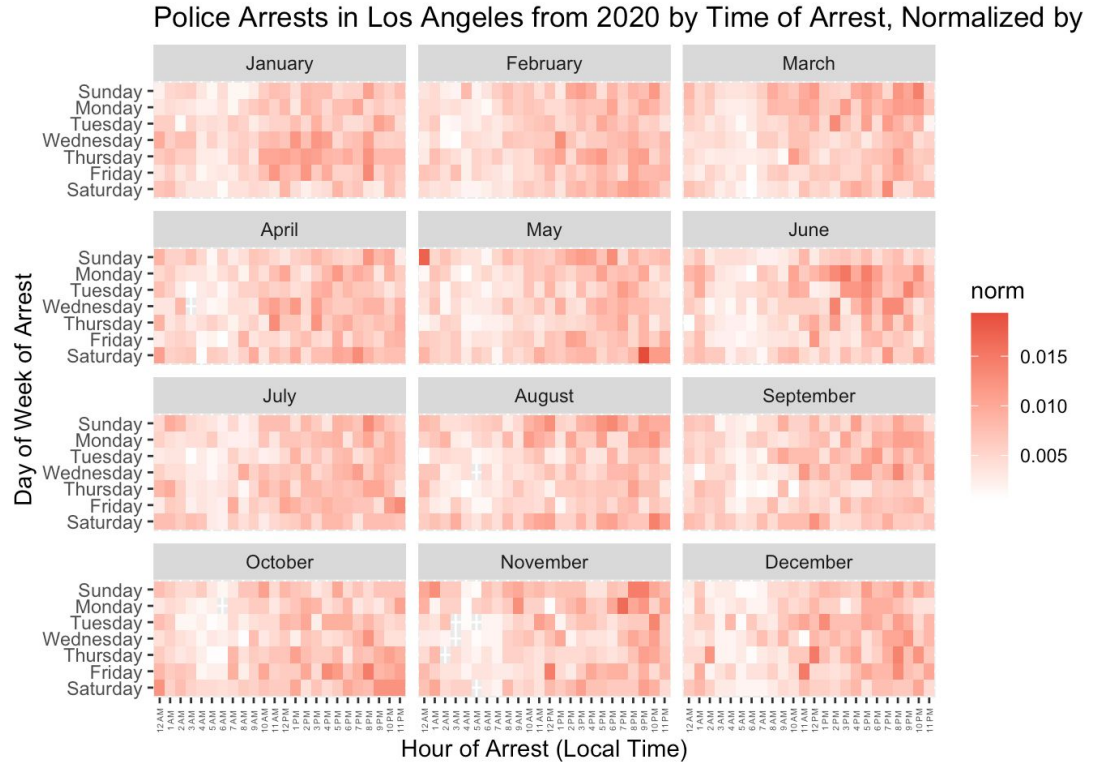
Correlation Analysis

Factor By Police District



Correlation Analysis

Factor By Month





Correlation Analysis

Musings:

- Battery, Robbery, and Criminal Threats rarely happens during 12am and 6am, while Burglary and Intimate Partner (aggravated assault) seems to be the opposite
- Sunday and Saturday are more prone to crimes