



Analysis of Crime Incidents from SFPD Reporting





Summary of Goals

WHAT:

Unravelling crime patterns and trends to better understand the safety level and categories of incidents that occur in different areas in SF.

WHY:

Stay vigilant on safety and security as SF continues to grow as a desirable city to live with thriving industry.

Provide insight to SF residents, guests and businesses on criminal activity in the area.

HOW:

Using crime data from various years to look at Crime Distribution:

Yearly, monthly, daily and hourly.

Crime Trends:

Most afflicted districts, most common crimes, unresolved crimes by district

More info about data at <https://data.sfgov.org/Public-Safety/-Change-Notice-Police-Department-Incidents/tmnf-yvry>

Data Provided by City and County of San Francisco. Incidents are derived from SFPD Crime Incident Reporting system. Updated on a daily basis; data available from 1 Jan 2003 up until two weeks from current date.



Data Exploration

Data.sfgov.org

Incidents derived from SFPD Crime Incident Reporting system
Updated daily, showing data from 1/1/2003 up until two weeks ago from current date.

Please note:

San Francisco police have implemented a new system for tracking crime. The dataset included here is still coming from the old system, which is in the process of being retired (a multi-year process). Data included here is no longer the official SFPD data.

File Volume

- Rows: 2.19M
- Columns: 13
- Each row is an Incident

Columns Names

- Incident Num
- Category
- Descript
- Day Of Week
- Date
- Time
- Pd District
- Resolution
- Address
- X Y
- Location



Data Cleanup

- Extracted data by year into separate data frames
- Grouped data based on: hours, days, months
- Cross-tabulated discreet variables: District and Crime Category
- Dropped Location, Discript, and PdID columns
- Split Date into Day, Month, and Year

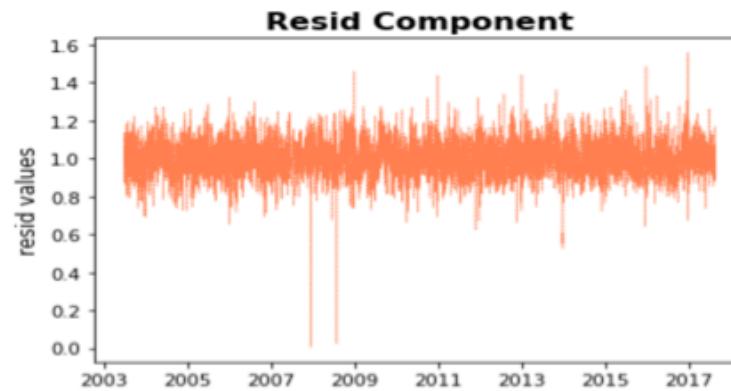
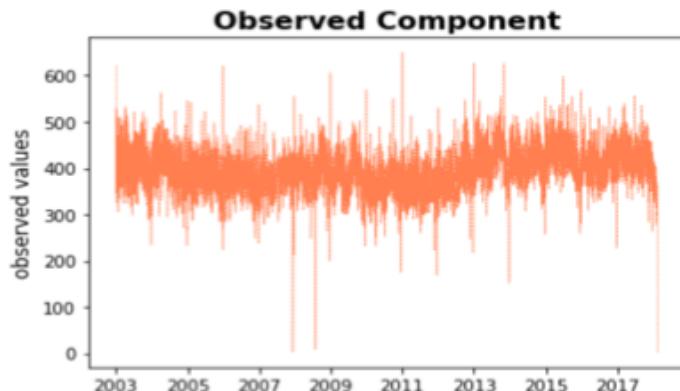
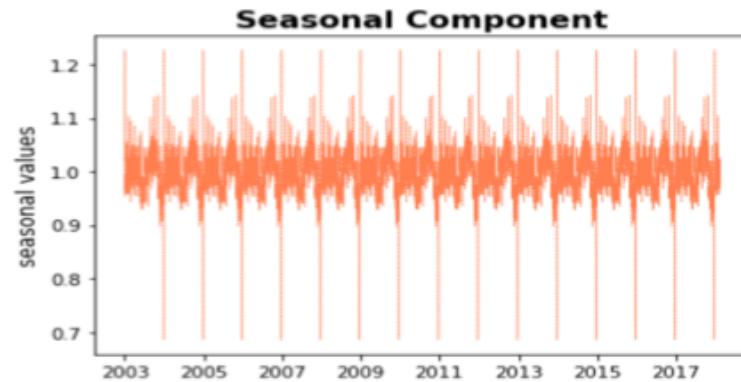
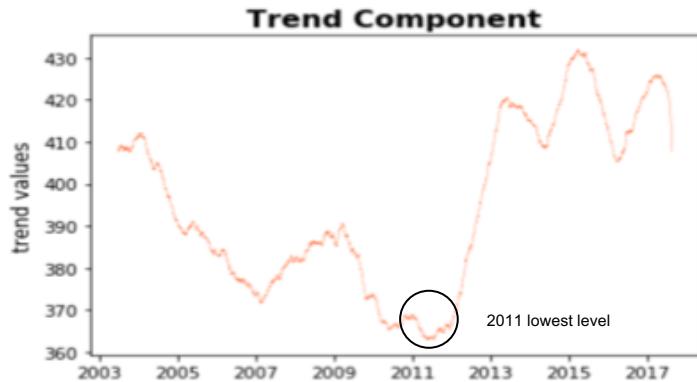
TREND ANALYSIS



Time Series Decomposition Analysis



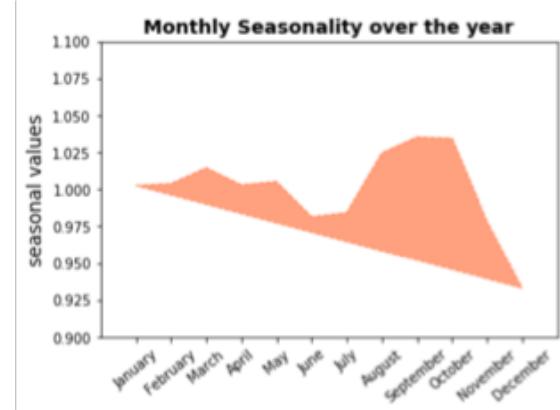
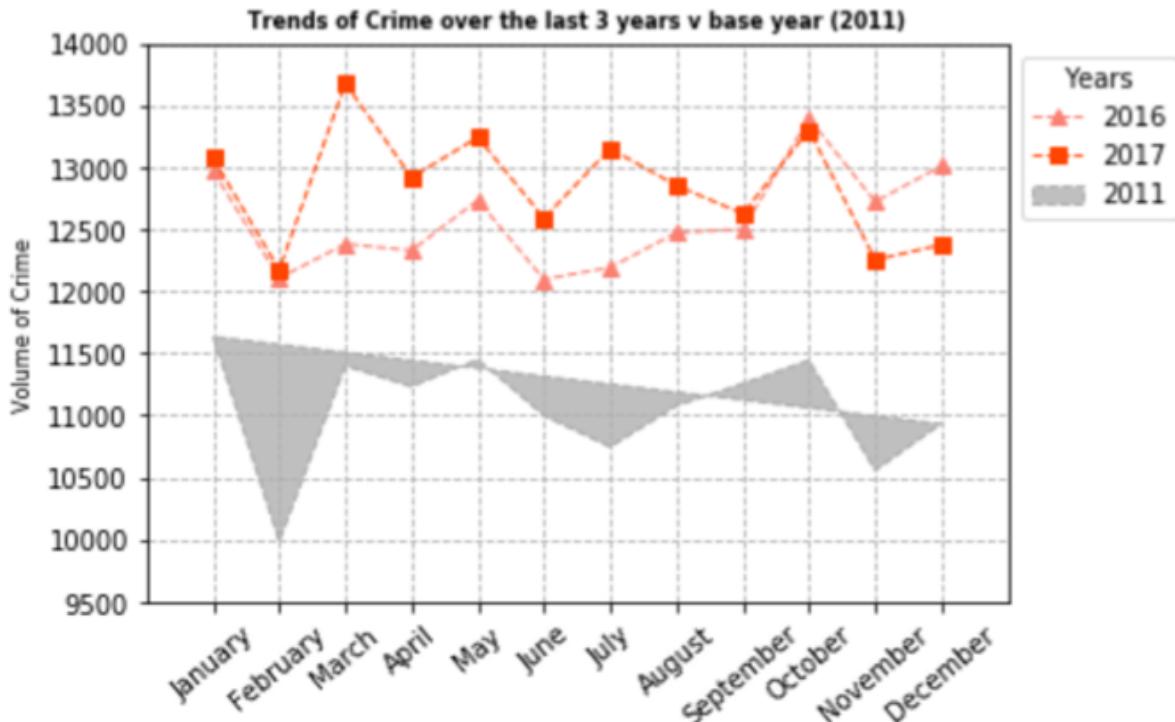
Yearly Trend





Yearly Trend

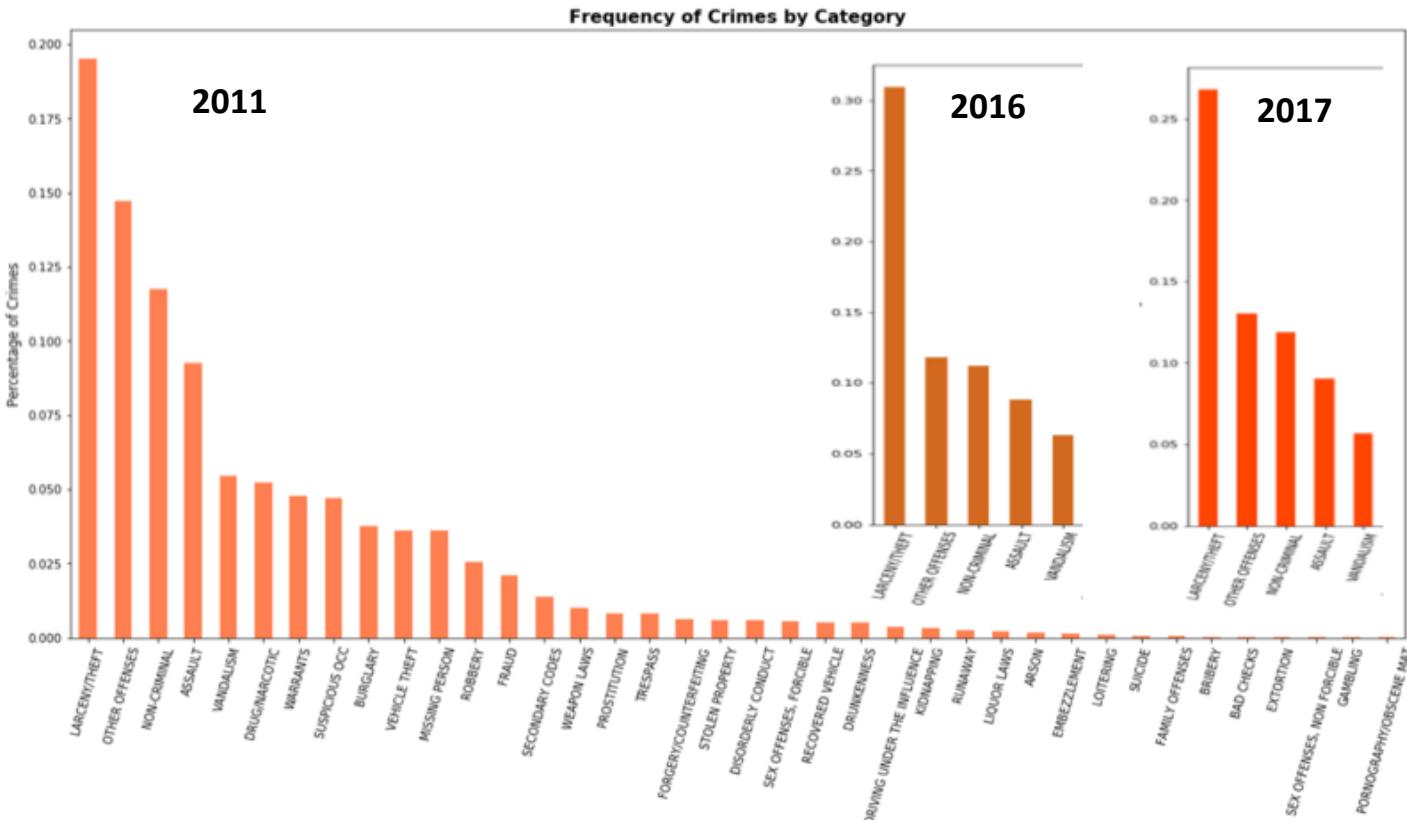
Seasonality Analysis





Yearly Trend

Crime Density by Category



Category	2011
LARCENY/THEFT	25905 19.5%
OTHER OFFENSES	19552 14.7%
NON-CRIMINAL	15586 11.7%
ASSAULT	12279 9.3%
VANDALISM	7243 5.5%
2016	
	40449 26.8%
	19689 13.0%
	17919 11.9%
	13603 9.0%
	8595 5.7%
2017	
	47712 30.9%
	18233 11.8%
	17292 11.2%
	13620 8.8%
	9751 6.3%

“Reducing ***violent crime*** is and will always be our top priority,” said Police Chief William Scott. “We’re working closely with community members and our City partners to reduce ***gun related violence***. Protecting lives and providing safety for the public- particularly our youth- is key to ensuring a vibrant future for everyone.”

March 1, 2018

SFPD Releases 2017 Year-End Crime Statistics

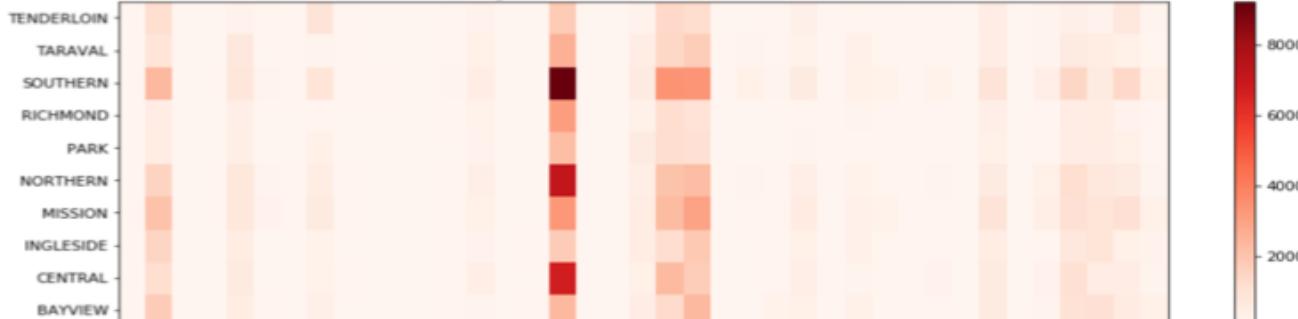
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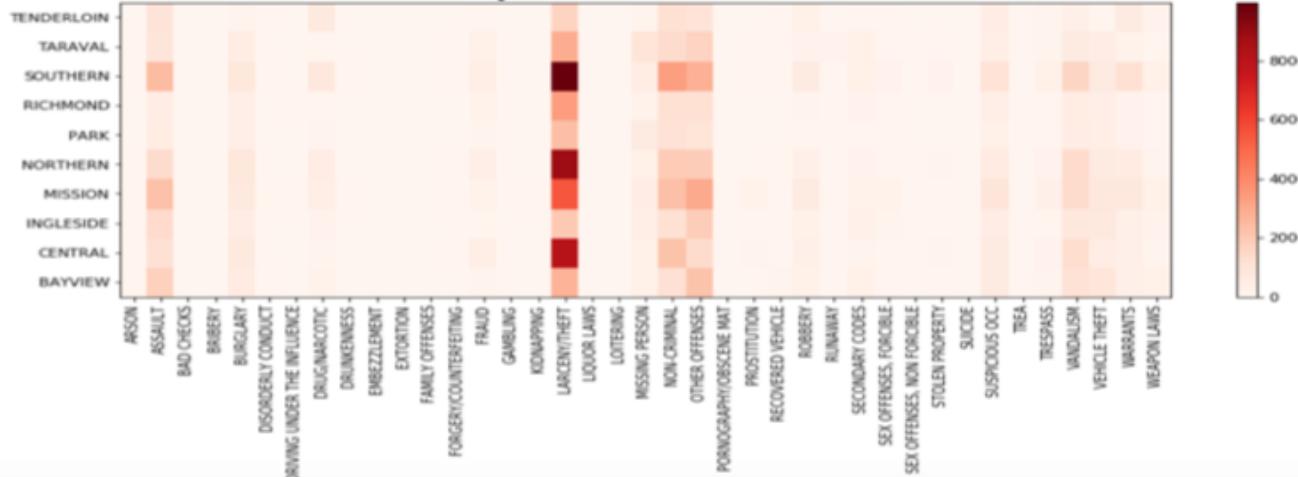
Yearly Trend

Crime Density by District

Heatmap for Crimes in SF : 2016

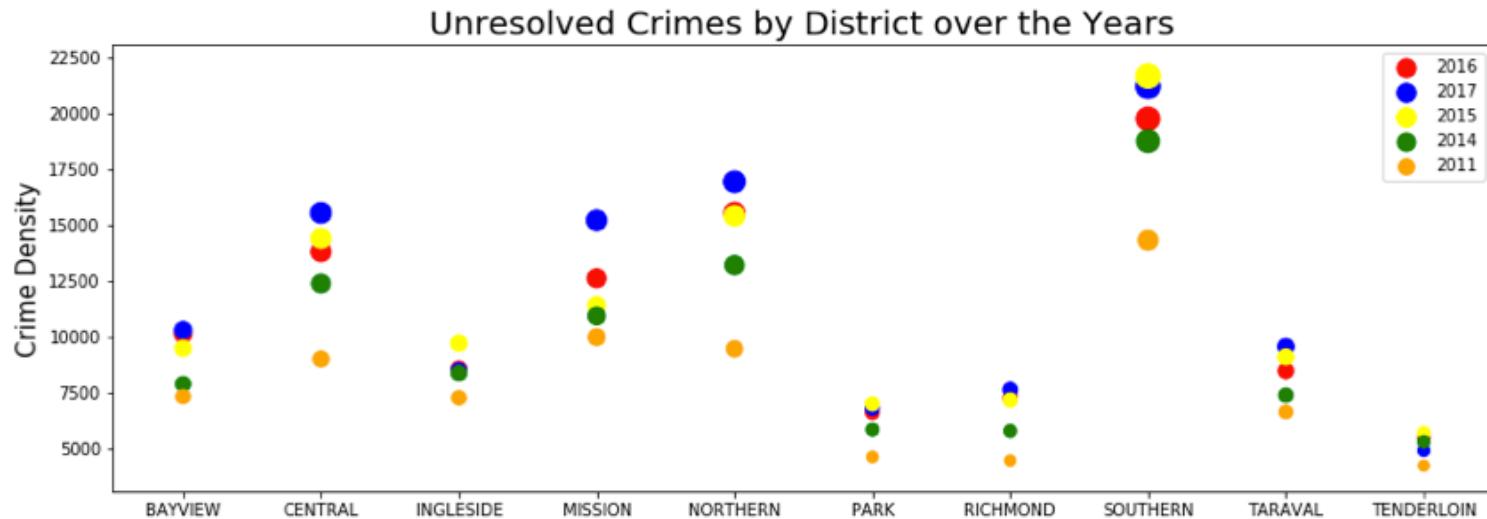


Heatmap for Crimes in SF : 2017





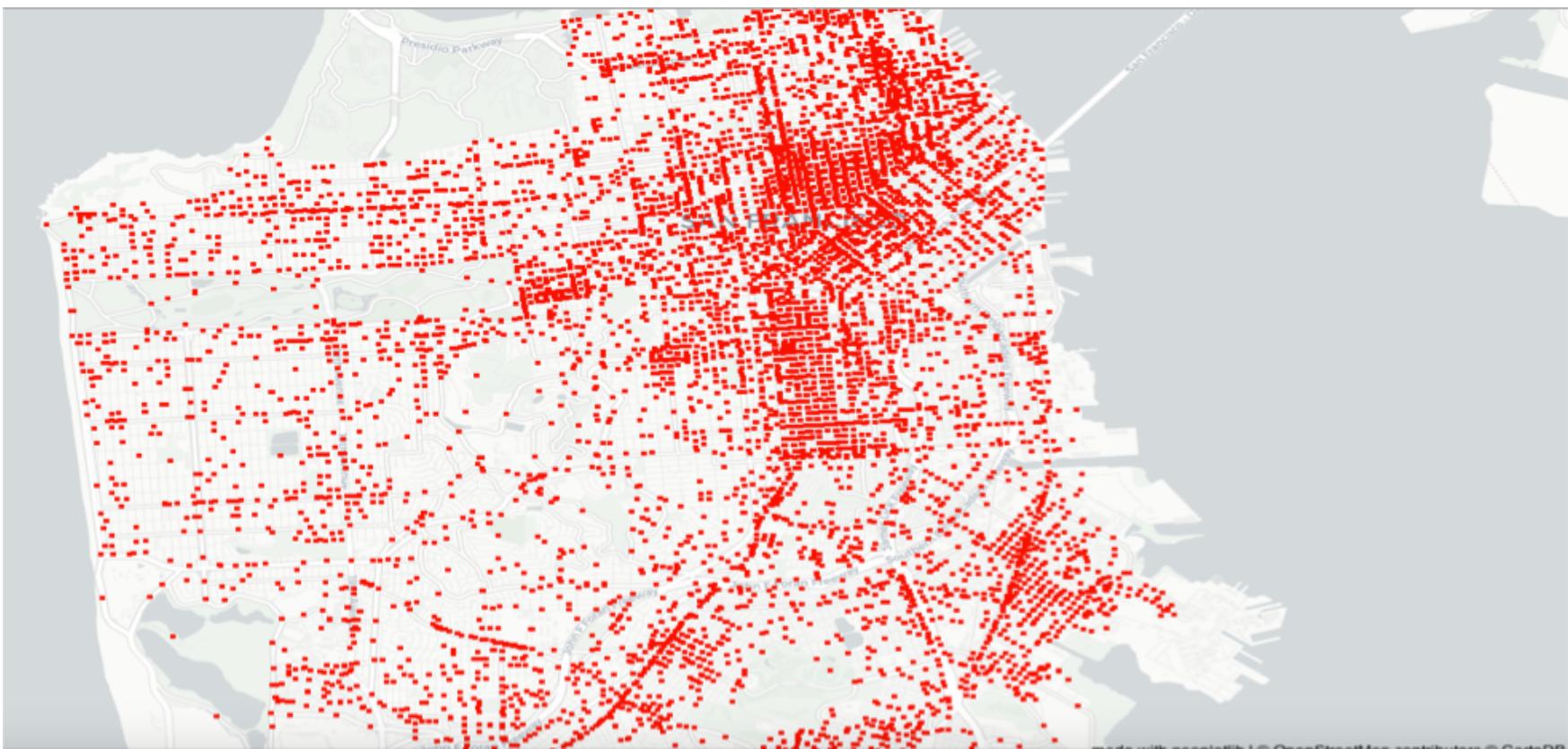
Yearly Trend





Yearly Trend

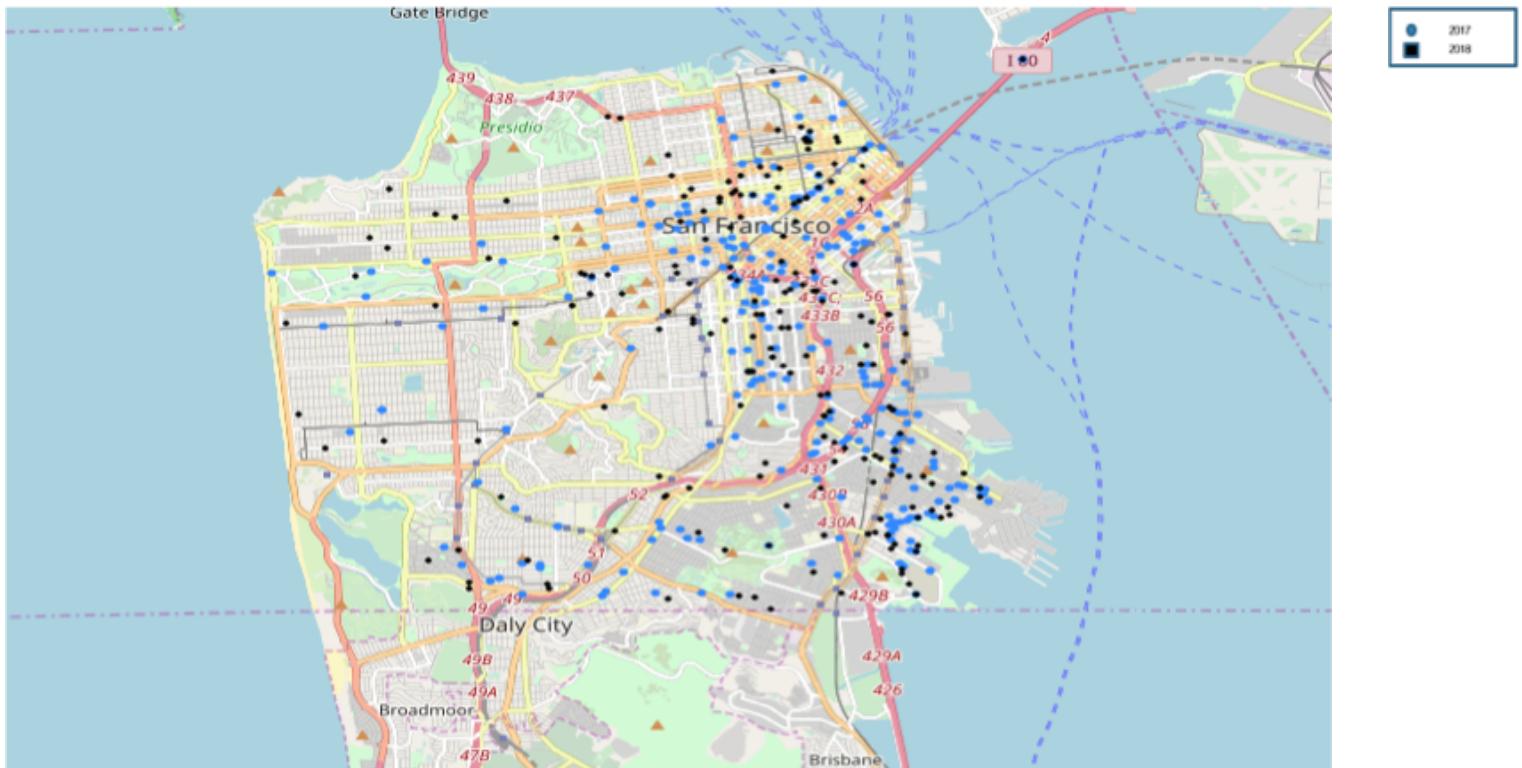
Unresolved Crimes : 2017





Yearly Trend

Unresolved-Arson Crimes : 2016 vs 2017





Yearly Trend

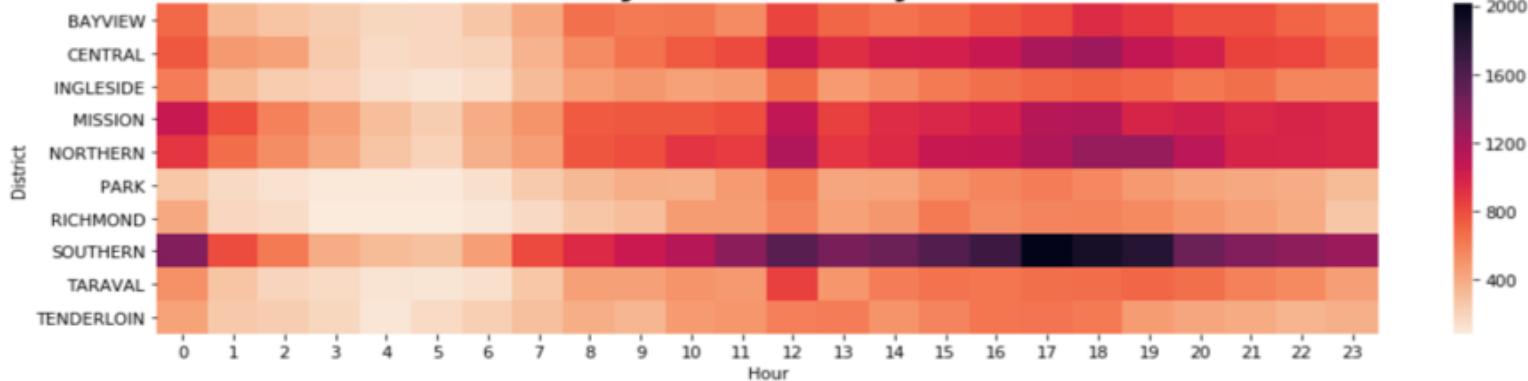
Vehicle Theft - 2018



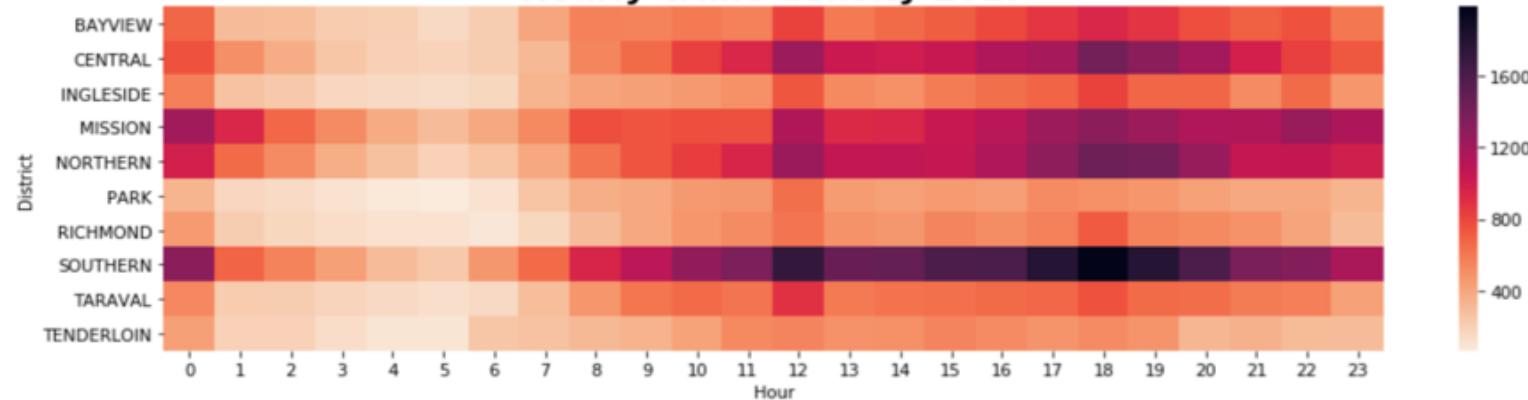


Hourly Trend

Hourly crime density 2016



Hourly crime density 2017

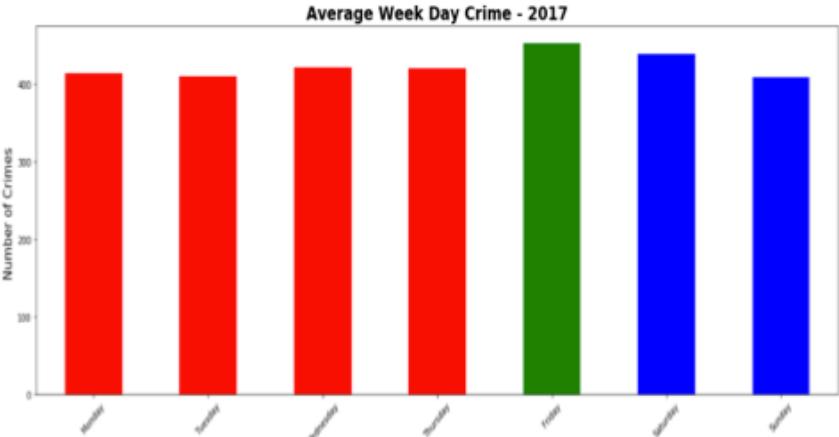
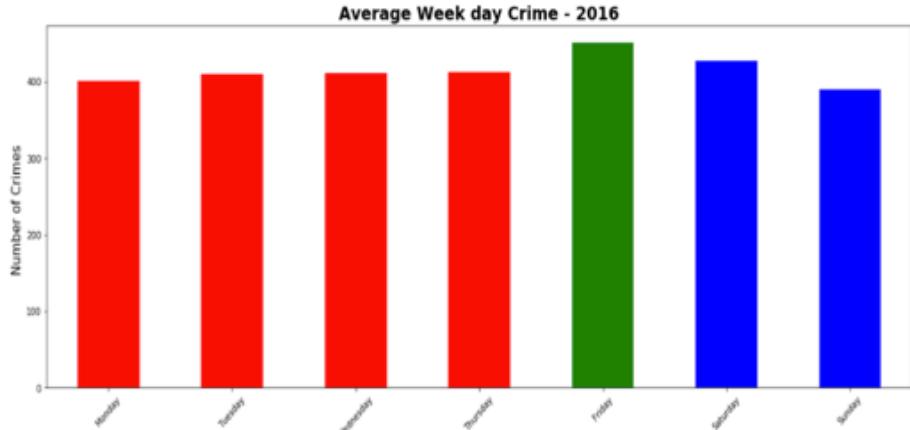




Daily Trend

2016

Ttest_statistic = 0.30372251276763623
Pvalue = 0.77159619088554254



2017

Ttest_statistic = 0.18995853708072147
Pvalue = 0.85560529543910158



Conclusion

- **Safety levels:** Most dangerous districts are Southern, Northern, and Central.
- **Most prevalent crime:** Larceny and Theft.
- **Crime by Category:** The top five categories remained the same over the years.
- **Yearly Trends:** 2011 was the lowest crime level increasing considerably afterwards.



Conclusion

- **Monthly Trends:** In terms of seasonality there are higher levels of Crime in August, September and October.
- **Day Of the Week Trends:** t-test p-value indicates that the average number of daily crimes does not vary significantly across days of the week (2016-2017).
- **Hourly Trends:** Safest- 4:00am-5:00 for all districts. Most dangerous- fairly scattered with 12:00 pm having highest crime rates.



Thanks!

Any questions ?

You can find our fully analysis at

- ◉ <https://github.com/mitrapiya25/SF-Crime-Analysis>