

A wide-angle photograph of the Chicago skyline at night, viewed from across a body of water. The Willis Tower is the most prominent building on the left. The city lights are reflected on the water's surface. The sky is a deep blue.

Chicago Community Area Overview using Data Science

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Background

- 60,000 hectares and sits 176 meters (578 feet) above sea level
- Southwestern shore of Lake Michigan
- 5th largest body of fresh water in the world
- **77 distinct neighborhoods**
- Passion for sports (bars/activities), parks and school reforms.
- Affordable housing and attractive and economically sound communities. The city's overall crime rate, especially the violent crime rate, is substantially higher than the US average.
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Problem Statement

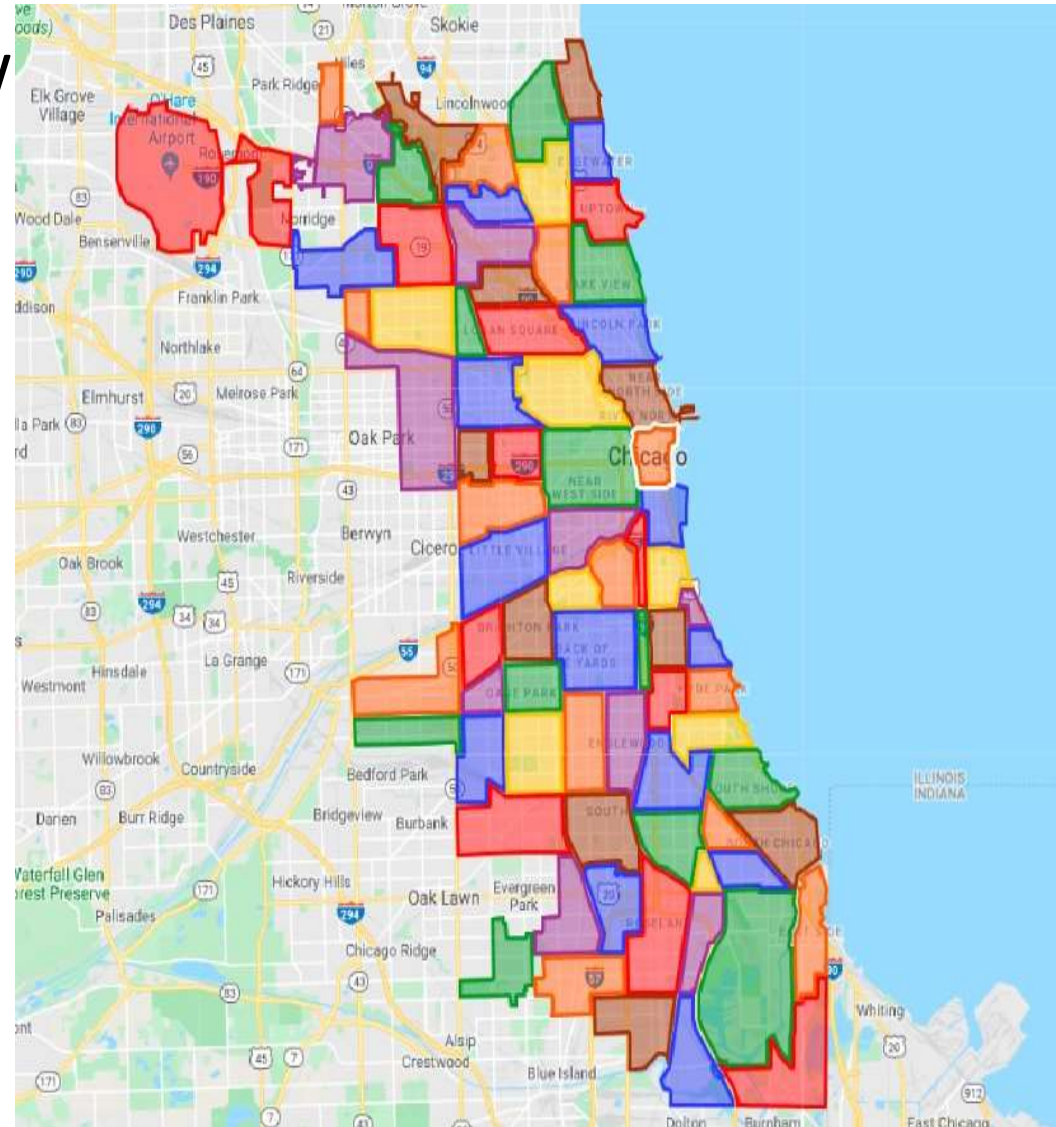
- There are multiple dataset available but no clear visuals and guidelines on how neighborhood around and in terms of safety which community area to pick up for residents.
- Visitors should get quick idea on communities and top 10 places around
- Resident should get quick idea on community safety and crime rate, type of crimes happening around.

Data Solution Summary

- Chicago City has maintained multiple datasets of different topics. It will be beneficial source of data to do further analysis and find out most visited places (Foursquare likes or comments) and for Community to find residence or living getting venue data (Foursquare) and analyze crime data (last 5 years) per community to check which community area is safer.
- Explore Chicago city to help residents or tourist know about below important data/information.
- Data objective:
 - (1) Chicago Community overview (Cook County).
 - (2) Top 5 attractions in LOOP / downtown area for Tourist.
 - (3) Top 10 venues for residents per community area.
 - (4) Rank Chicago community areas for safe living based on Crime data.

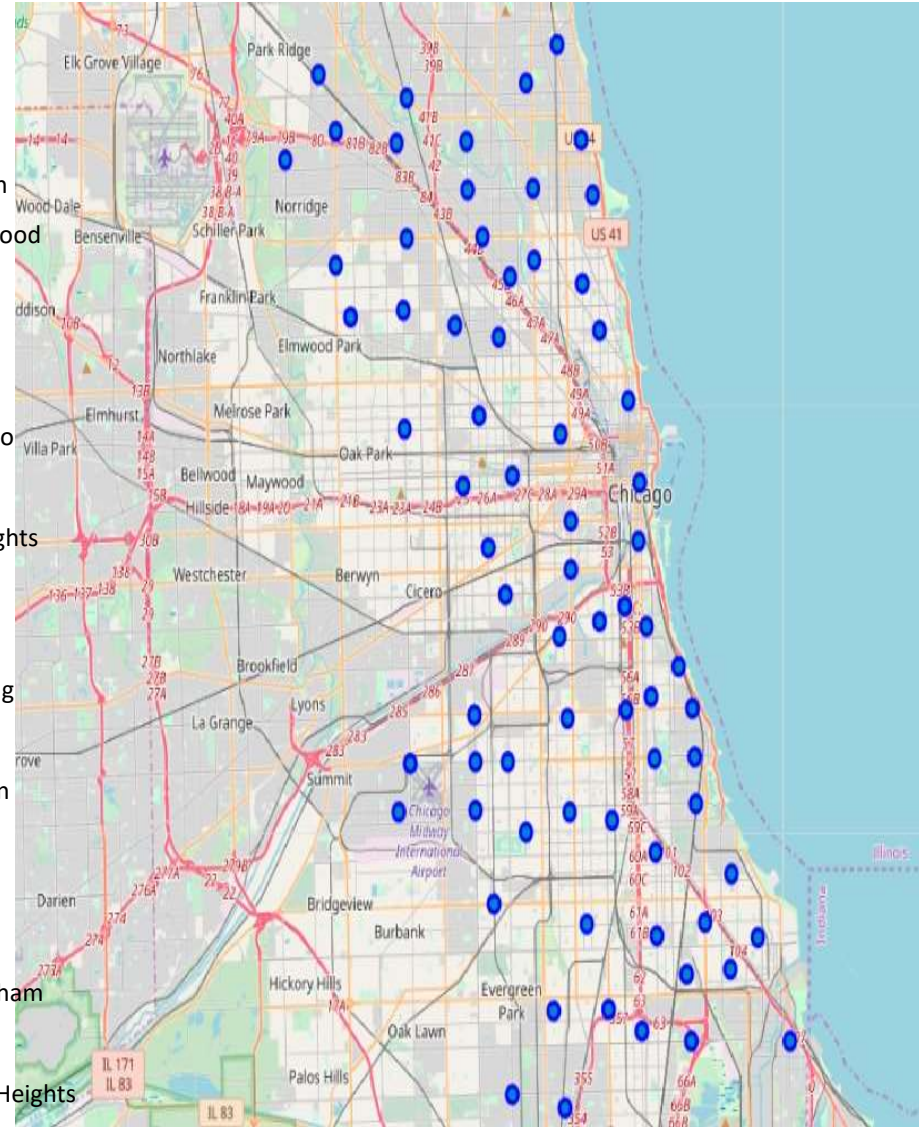
Part1: Community Overview

- 77 distinct neighborhoods
- Area Names and exact location on map
- Chicago City Dataset available public:
<https://data.cityofchicago.org>
- Get Coordinates from Google
- Plot center of each community area using folium/map library



Part1: Community Overview

- | | | | |
|-------------------|----------------------|--------------------------|----------------------|
| • Near North Side | • Irving Park | • Fuller Park | • West Lawn |
| • Loop | • Dunning | • Grand Boulevard | • Chicago Lawn |
| • Near South Side | • Montclair | • Kenwood | • West Englewood |
| • North Center | • Belmont Craig | • Washington Park | • Englewood |
| • Lake View | • Hermosa | • Hyde Park | • Chatham |
| • Lincoln Park | • Humboldt Park | • Woodlawn | • Avalon Park |
| • Avondale | • West Town | • South Shore | • South Chicago |
| • Logan Square | • Austin | • Bridgeport | • Burnside |
| • Rogers Park | • West Garfield Park | • Greater Grand Crossing | • Calumet Heights |
| • West Ridge | • East Garfield Park | • Garfield Ridge | • Roseland |
| • Uptown | • Near West Side | • Archer Heights | • Pullman |
| • Lincoln Square | • North Lawndale | • Brighton Park | • South Deering |
| • Edison Park | • South Lawndale | • McKinley Park | • East Side |
| • Norwood Park | • Lower West Side | • New City | • West Pullman |
| • Jefferson Park | • Armour Square | • West Elsdon | • Riverdale |
| • Forest Glen | • Douglas | • Gage Park | • Hegewisch |
| • North Park | • Oakland | • Clearing | • Ashburn |
| • Albany Park | • Mount Greenwood | | • Auburn Gresham |
| • O'Hare | | | • Beverly |
| • Edgewater | | | • Washington Heights |
| • Portage Park | | | |
| • Morgan Park | | | |



Part2: Top 5 Venues in Chicago Downtown

	name	categories	lat	lng
0	The Art Institute of Chicago	Art Museum	41.879610	-87.623552
1	Symphony Center (Chicago Symphony Orchestra)	Concert Hall	41.879275	-87.624680
2	Chicago Architecture Foundation	Museum	41.878556	-87.624550
3	Thorne Miniature Rooms	Museum	41.879532	-87.623680
4	The South Garden	Garden	41.878626	-87.624207

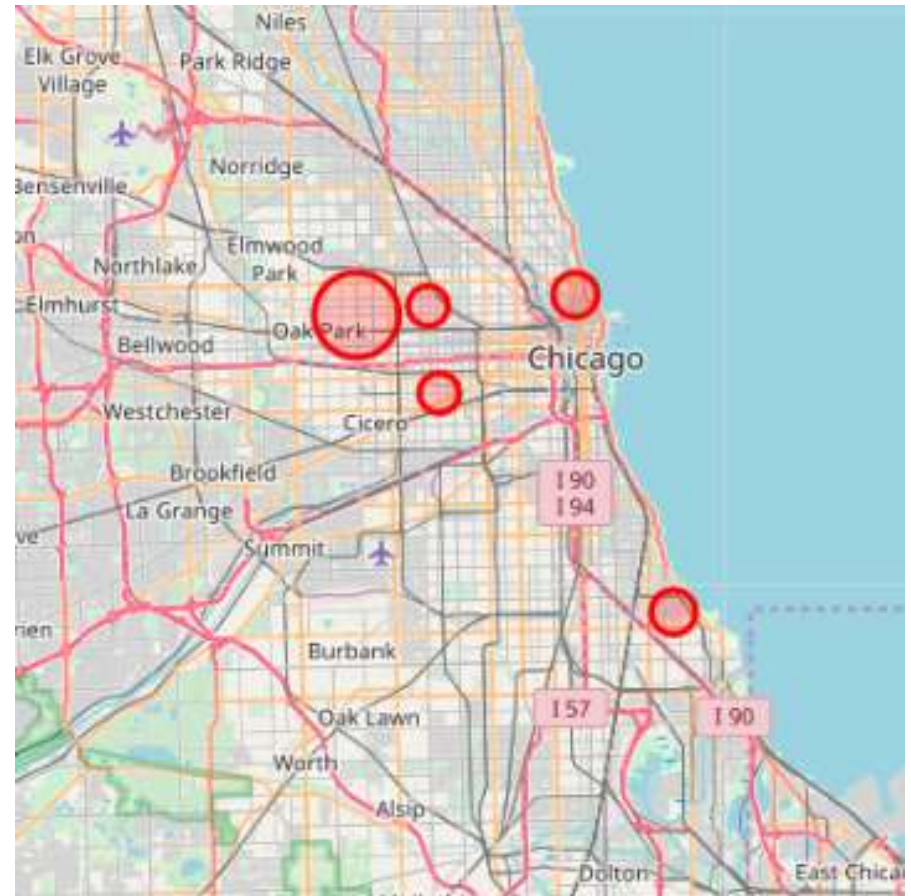
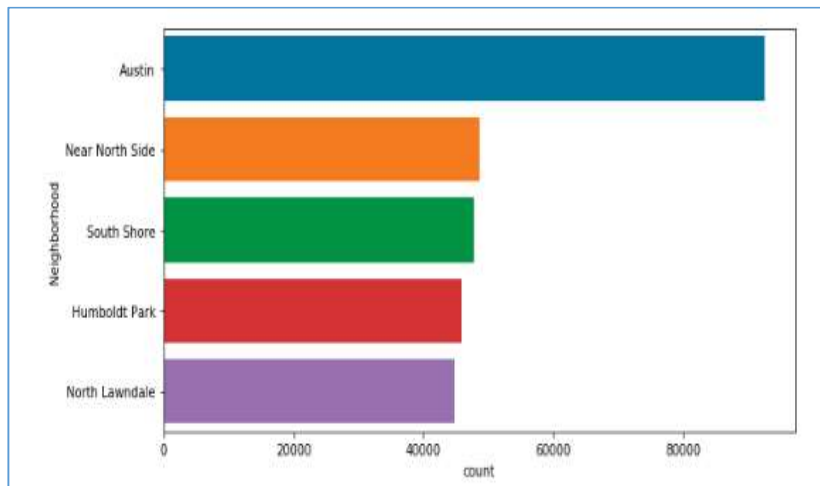


Part3: Top 10 Venues in each Community Area

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Albany Park	Korean Restaurant	Dive Bar	Discount Store	Mobile Phone Shop	Seafood Restaurant	Fried Chicken Joint	Pizza Place	Coffee Shop	Pet Store	Department Store
1	Archer Heights	Mexican Restaurant	Bank	Grocery Store	Video Store	Seafood Restaurant	Nightclub	Rental Car Location	Bakery	Bar	Dive Bar
2	Armour Square	Chinese Restaurant	Grocery Store	Sandwich Place	Sports Bar	Cosmetics Shop	Gas Station	Hot Dog Joint	Italian Restaurant	Fast Food Restaurant	Farmers Market
3	Ashburn	Cosmetics Shop	Mexican Restaurant	Light Rail Station	Fried Chicken Joint	Eastern European Restaurant	Filipino Restaurant	Fast Food Restaurant	Farmers Market	Eye Doctor	Ethiopian Restaurant
4	Auburn Gresham	Discount Store	Pool	Park	Basketball Court	Donut Shop	Filipino Restaurant	Fast Food Restaurant	Farmers Market	Eye Doctor	Ethiopian Restaurant
5	Austin	Breakfast Spot	Discount Store	Pizza Place	BBQ Joint	Food	Café	Thrift / Vintage Store	Cosmetics Shop	Dessert Shop	Diner
6	Avalon Park	Burger Joint	Grocery Store	Diner	Fast Food Restaurant	Cajun / Creole Restaurant	Sandwich Place	Boutique	Pizza Place	Home Service	Dessert Shop
7	Avondale	Brewery	Beer Store	Burger Joint	German Restaurant	Pub	Park	Gaming Café	Restaurant	Italian Restaurant	Fried Chicken Joint

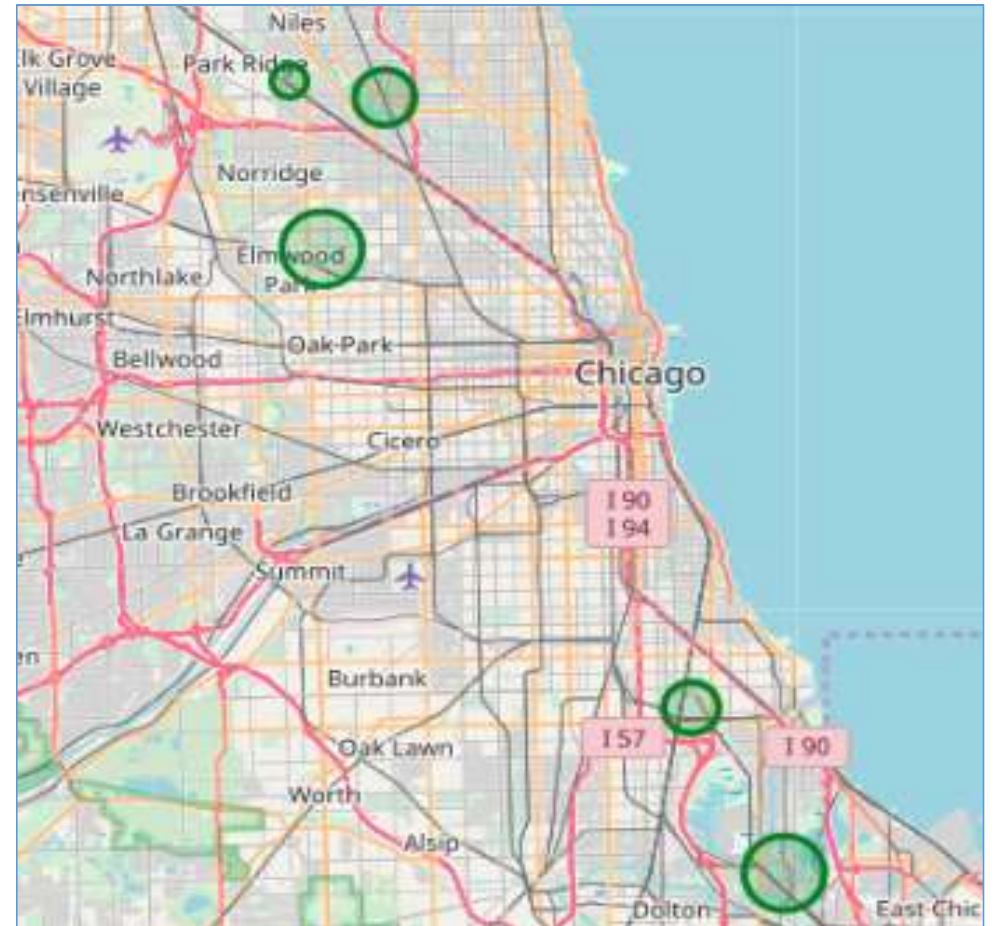
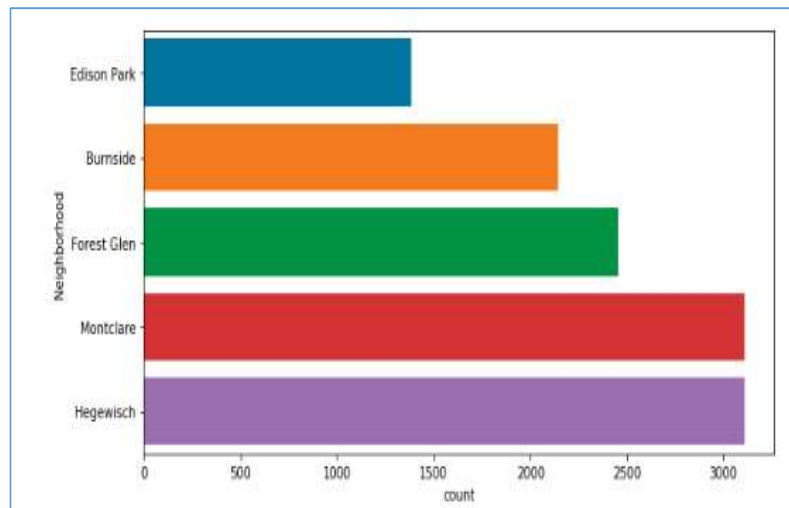
Part4.1: Top 5 not safe community areas

Community Area	Value Count
Austin	92679
Near North Side	48751
South Shore	47731
Humboldt Park	45943
North Lawndale	44819



Part4.2: Top 5 safe community areas

Neighborhood	ValueCount
Edison Park	1385
Burnside	2144
Forest Glen	2454
Montclare	3109
Hegewisch	3109



Machine Learning: k-means clustering

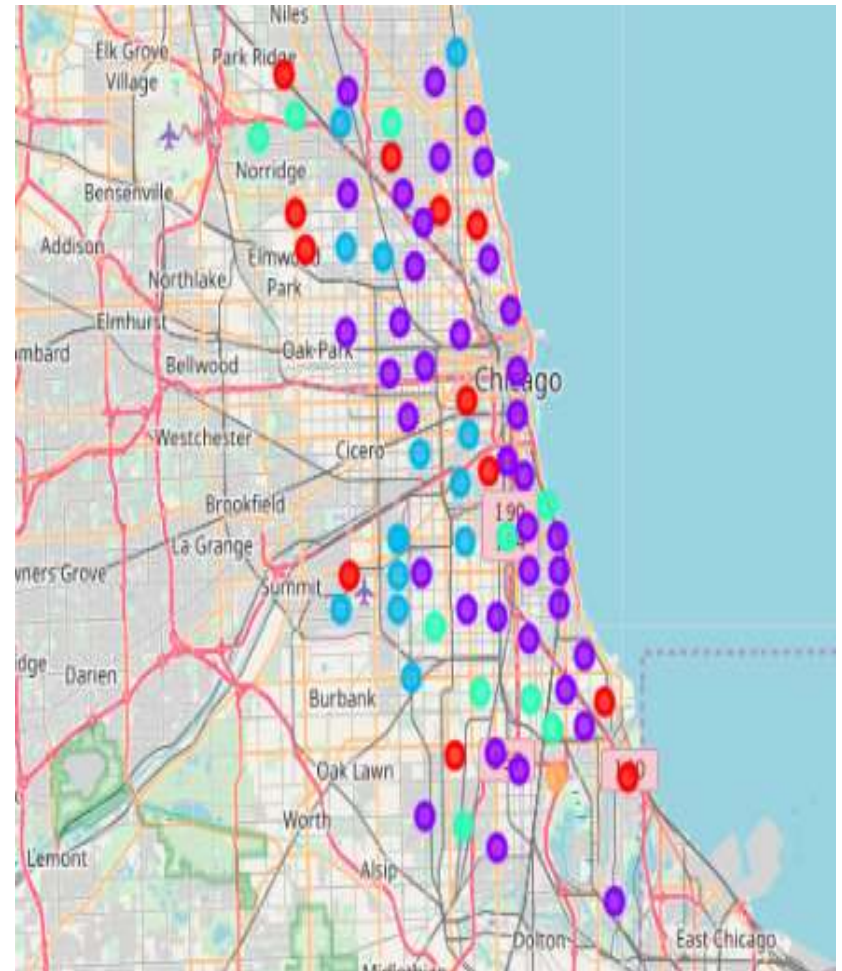
Cluster1 (highlighted **Purple**) Restaurant and fast food place like sandwich store or coffee shops all around.

Cluster2 (highlighted **Red**) famous Pizza restaurants around.

Cluster3 (highlighted **light green**), Parking spots around.

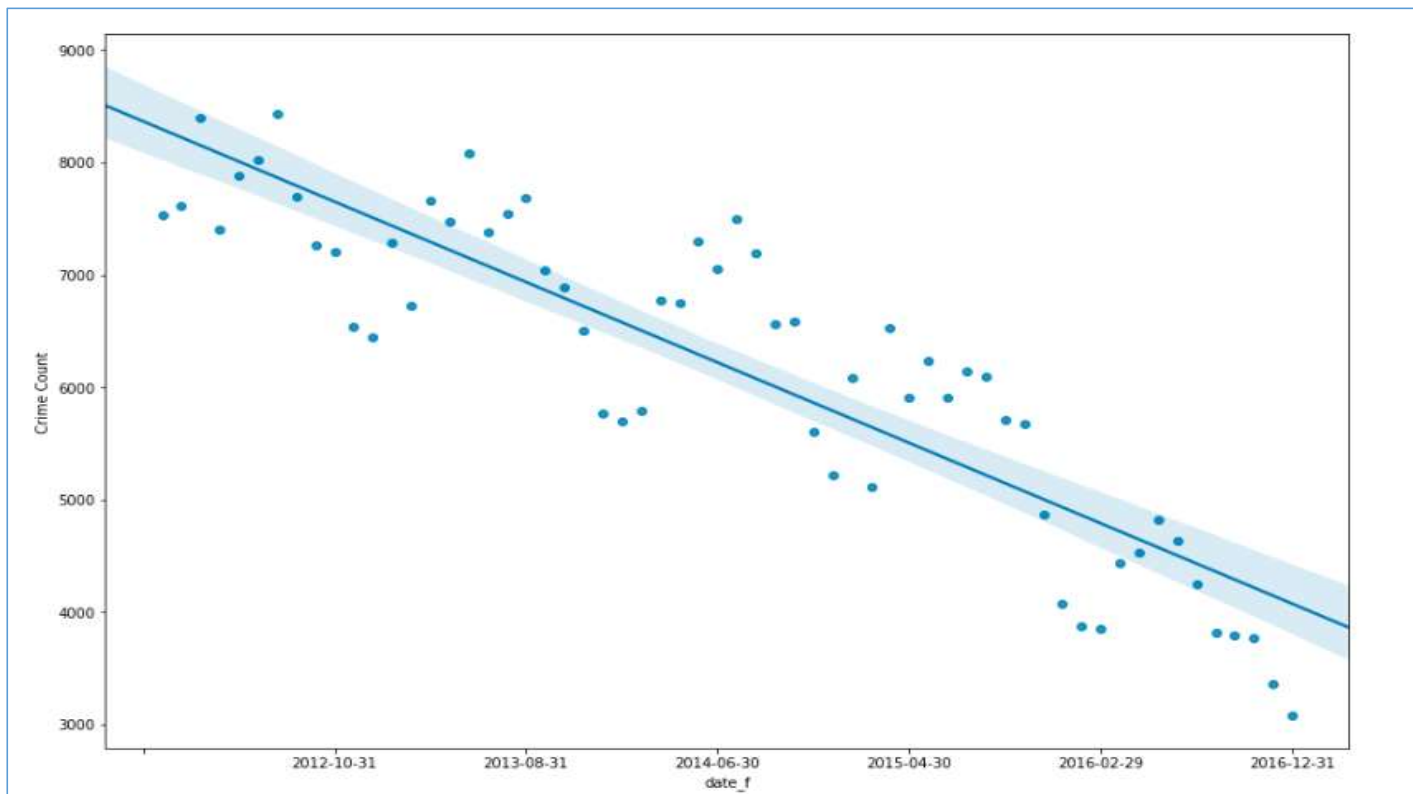
Cluster4 (highlighted **light blue**), Mexican restaurants around

Cluster5 (highlighted **orange**) odd man out with mixed venue.



Machine Learning: Linear Regression

(Y) Predict Crime Count = 8366.88926554 (b) - 71.56085024 (m) * (x) Future Date Value



Conclusion

- Overview of 77 community area in Chicago and plot on map
- In loop area top 5 venues found
- In each community area top 10 venues found and areas are clustered as per venue liking.
- Chicago crime data analysis and top 5 safe and top 5 not safe community areas. Additional findings are
 - 4.1) Crimes rate has be decreased from 2012 to 2017
 - 4.2) Crimes rate, on given year, is more during summer time.
 - 4.3) Predictive analysis (linear regression) for future dates.

Thank You.