

Chicago Neighborhoods

Crime and Business Activities

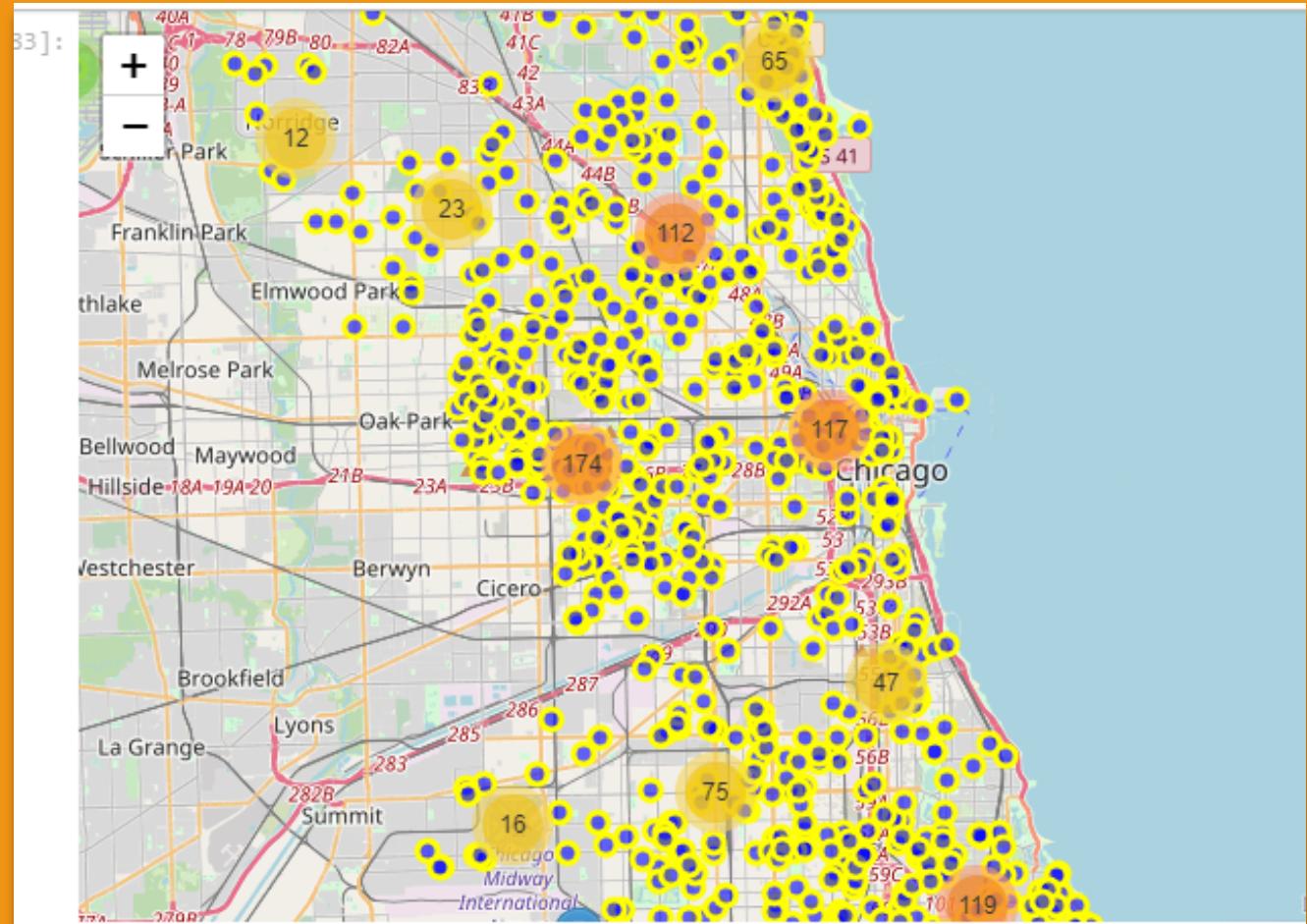
Introduction

- In 2012 Chicago was called the “murder capital” of the USA
- Murder rates - murders per 100,000 residents - Chicago has much fewer killings than St. Louis, Baltimore, Kansas City, Cleveland or Washington DC
- What are the crime patterns and business activities in different neighborhoods in Chicago?
- Government authorities, residents, business investors are interested in this problem.

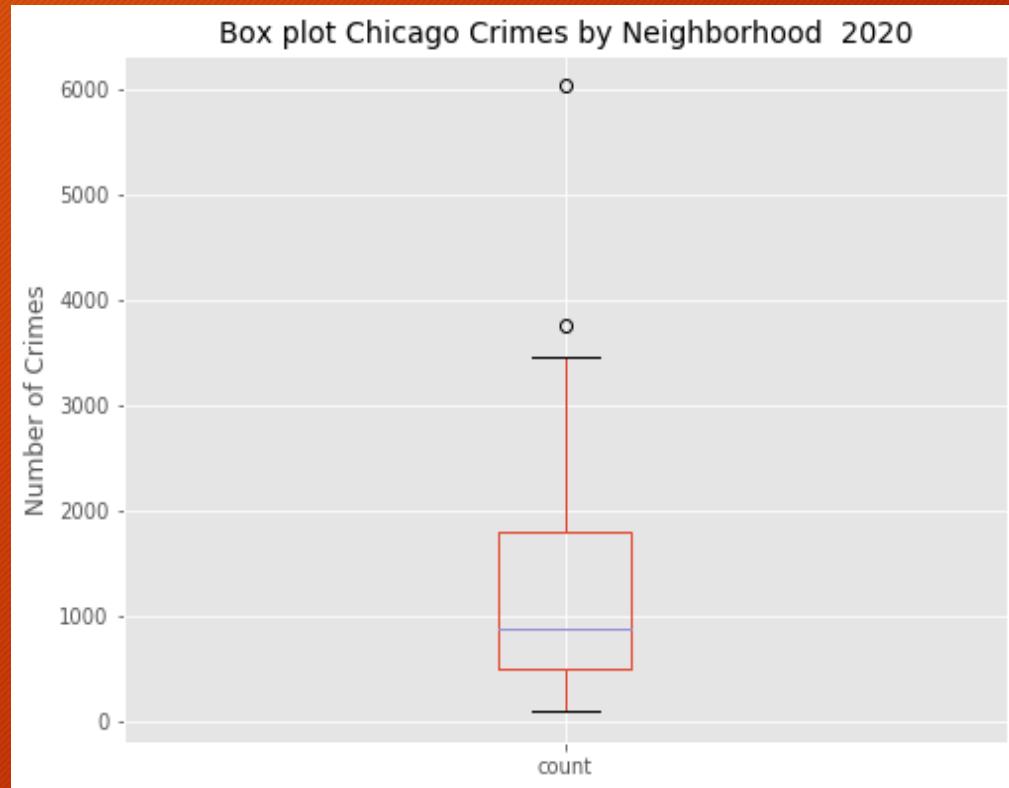
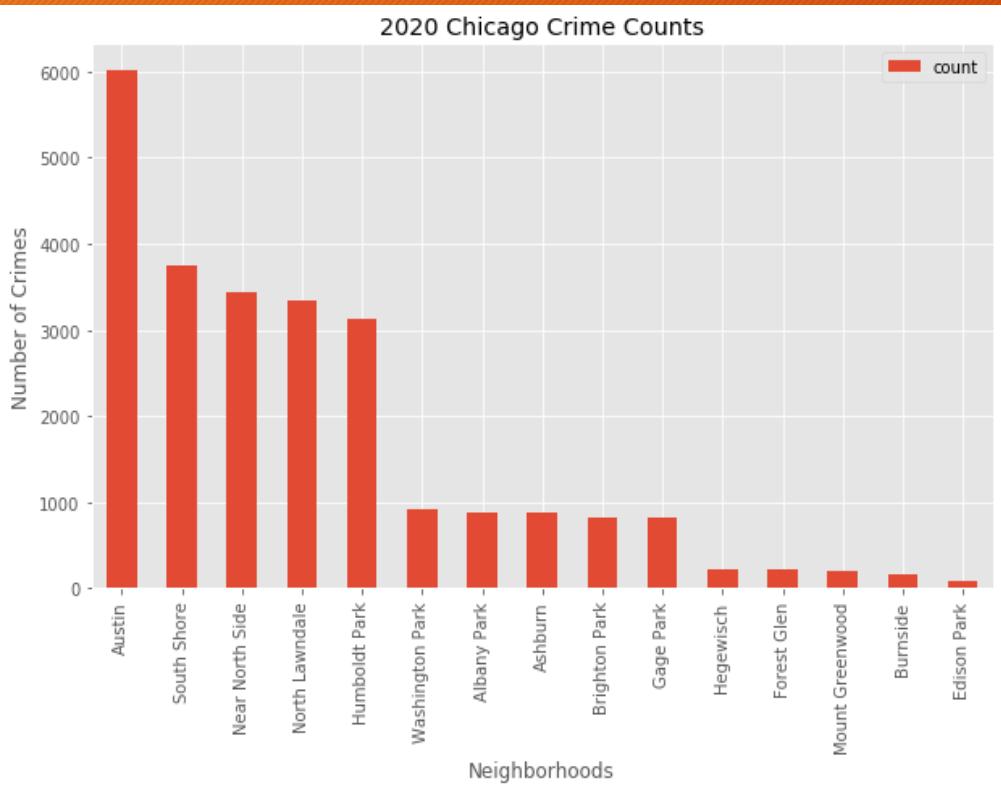
Data

- Chicago Data Portal was the main source for this study
- About 7 million rows/samples and 22 columns/features from 2001 - 2020
- Wikipedia webpage was used to identify neighborhood names
- Only 2020 data was included (personal computer couldn't do all)
- Missing values, few columns dropped. Day and Neighborhood (names) columns added.
- Cleaned data contains about 98,000 rows and 10 columns.

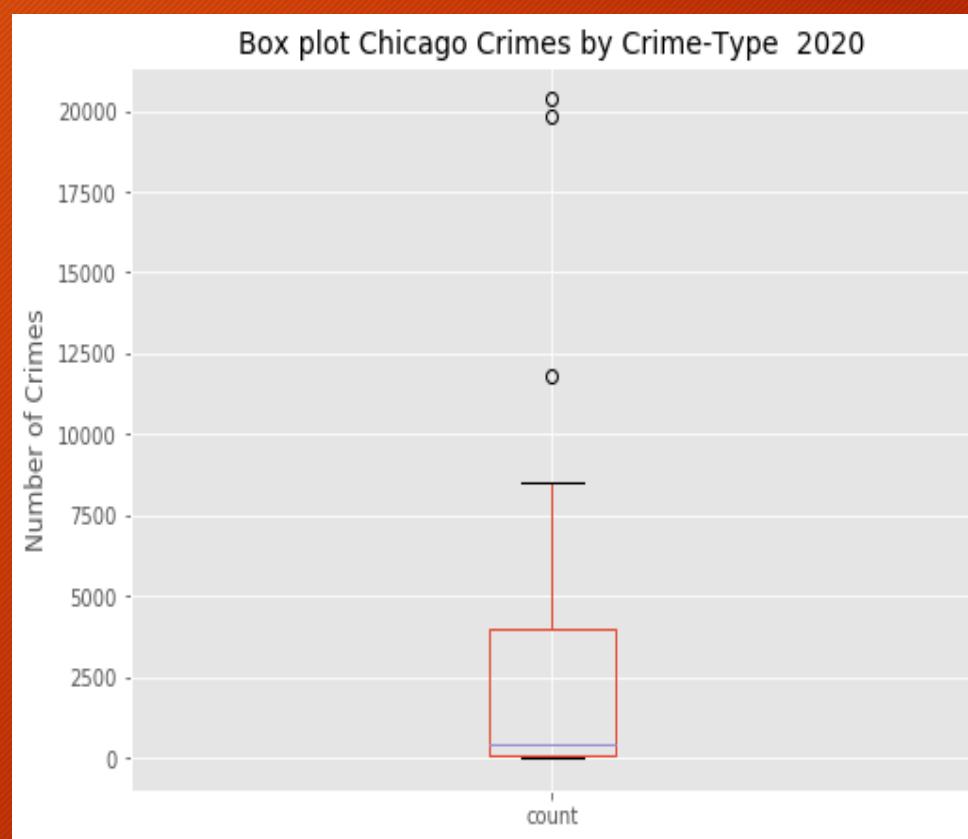
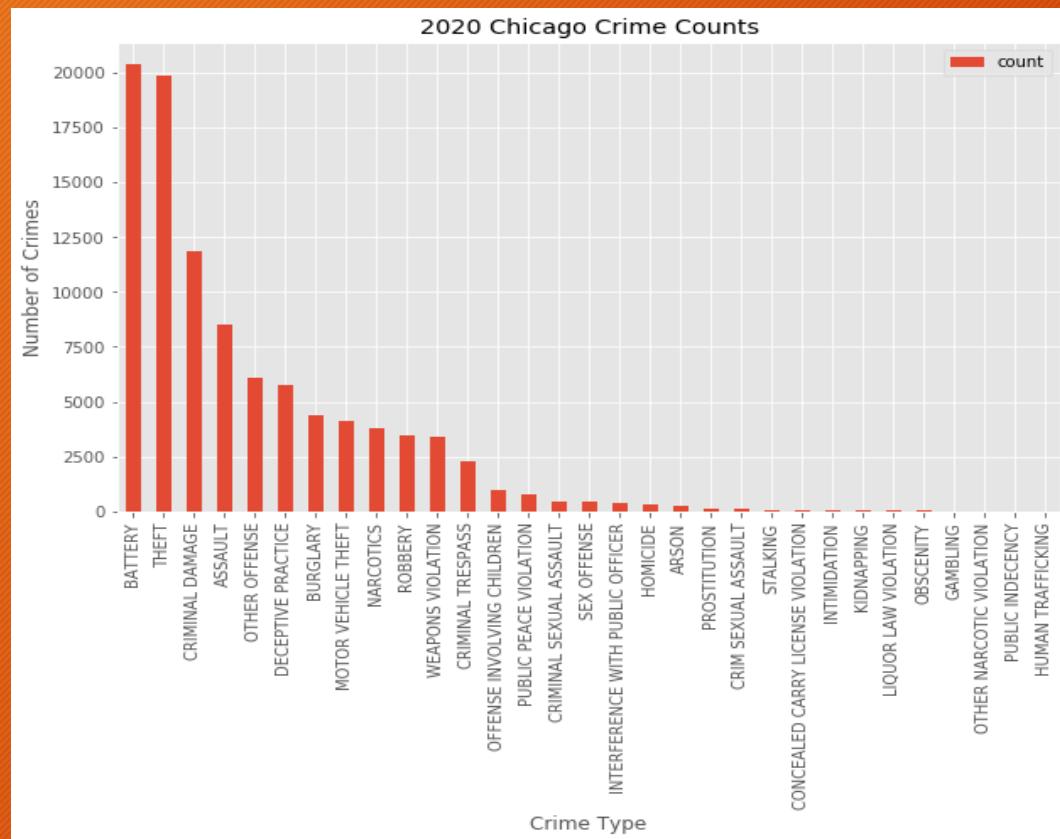
Crime Incidents and Clusters(numbers)



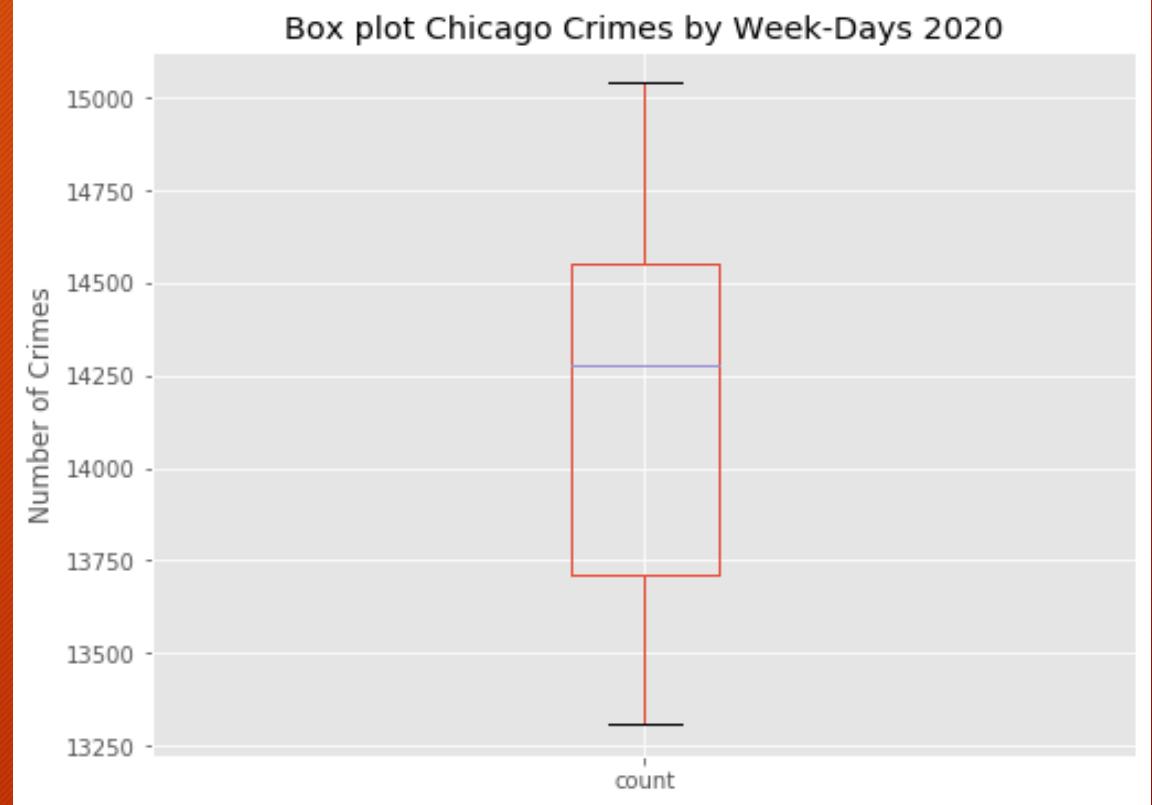
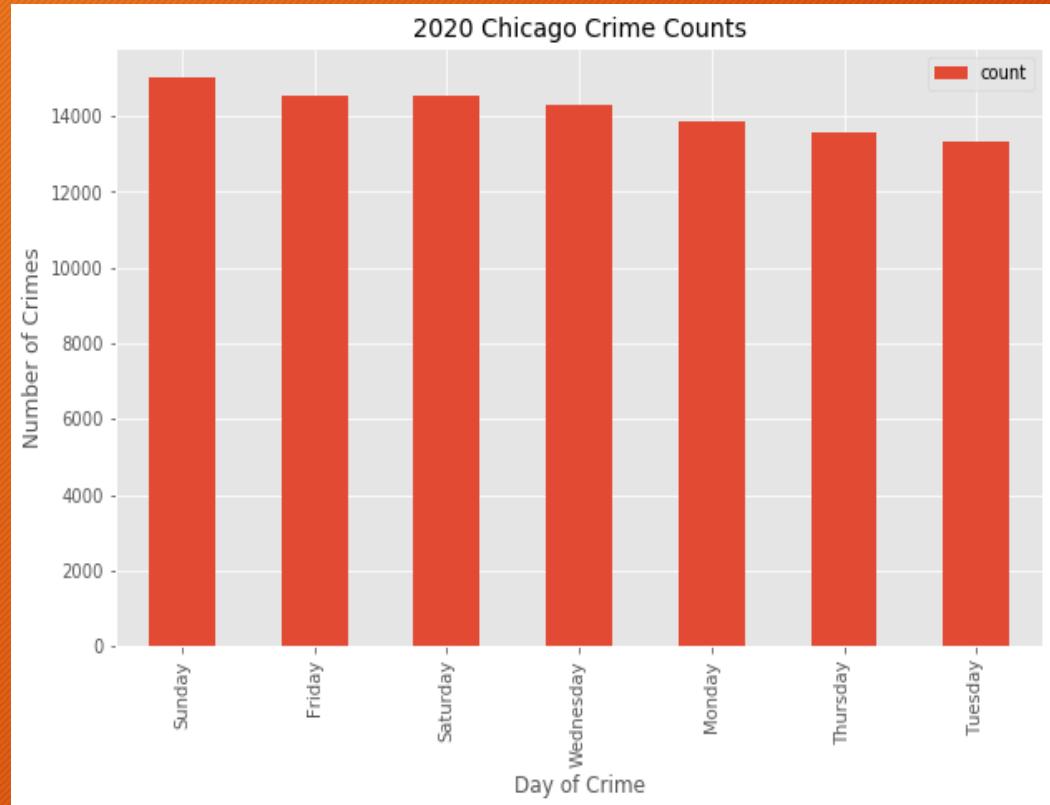
Methodology - Neighborhoods



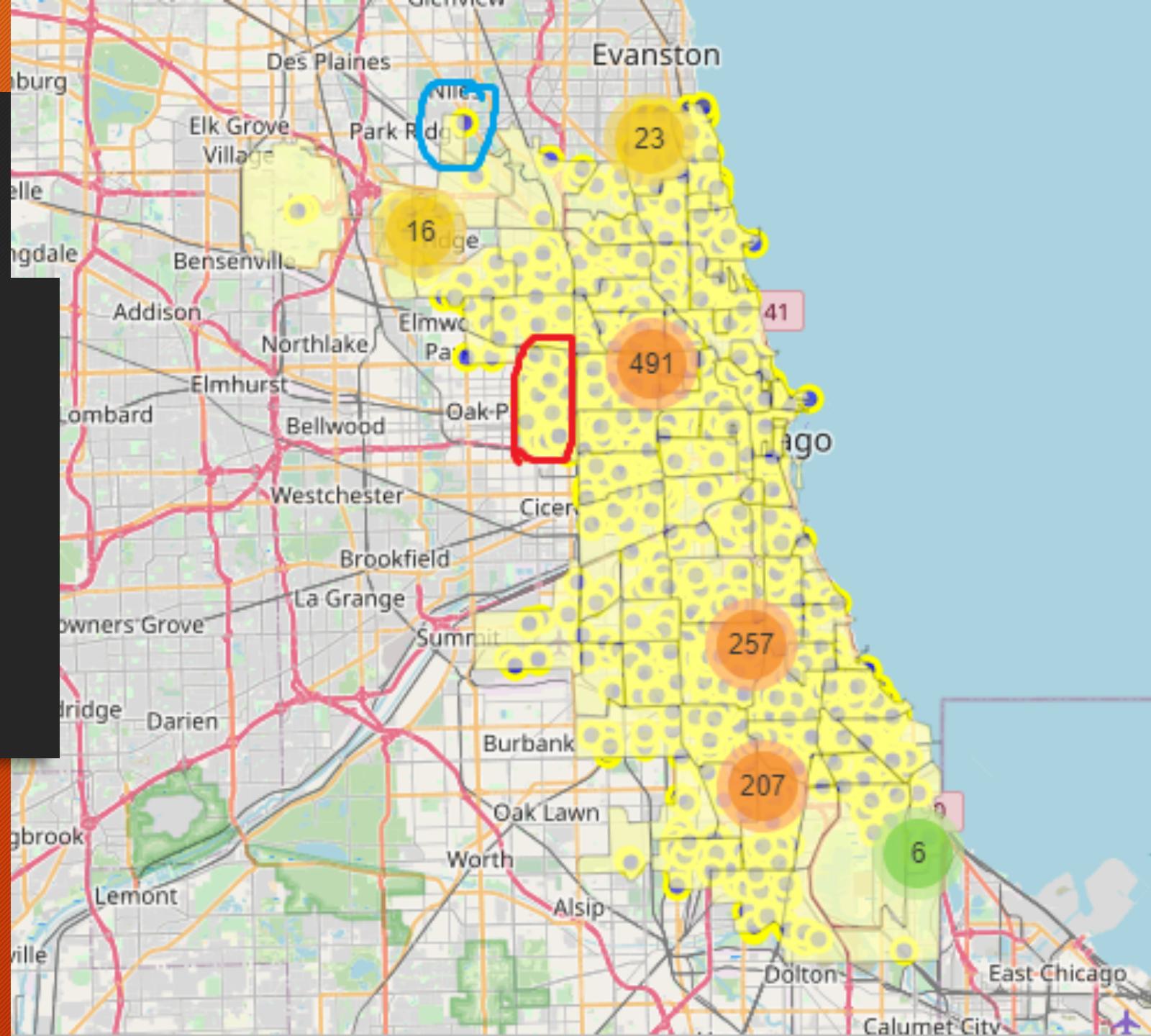
Methodology - Crime Types



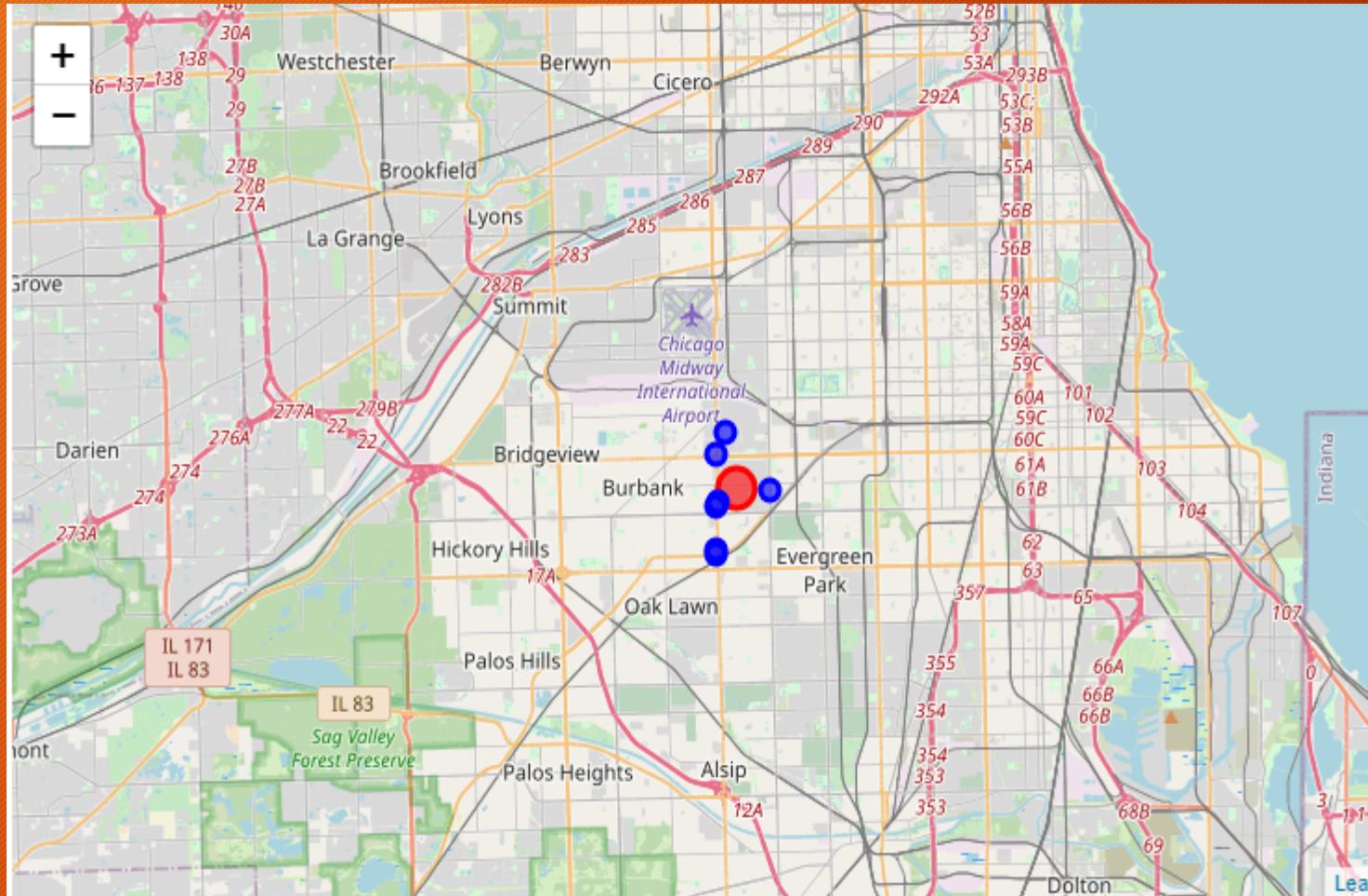
Methodology - Day of Week



Austin (red)
and Edison
Park (blue)
Highest &
lowest

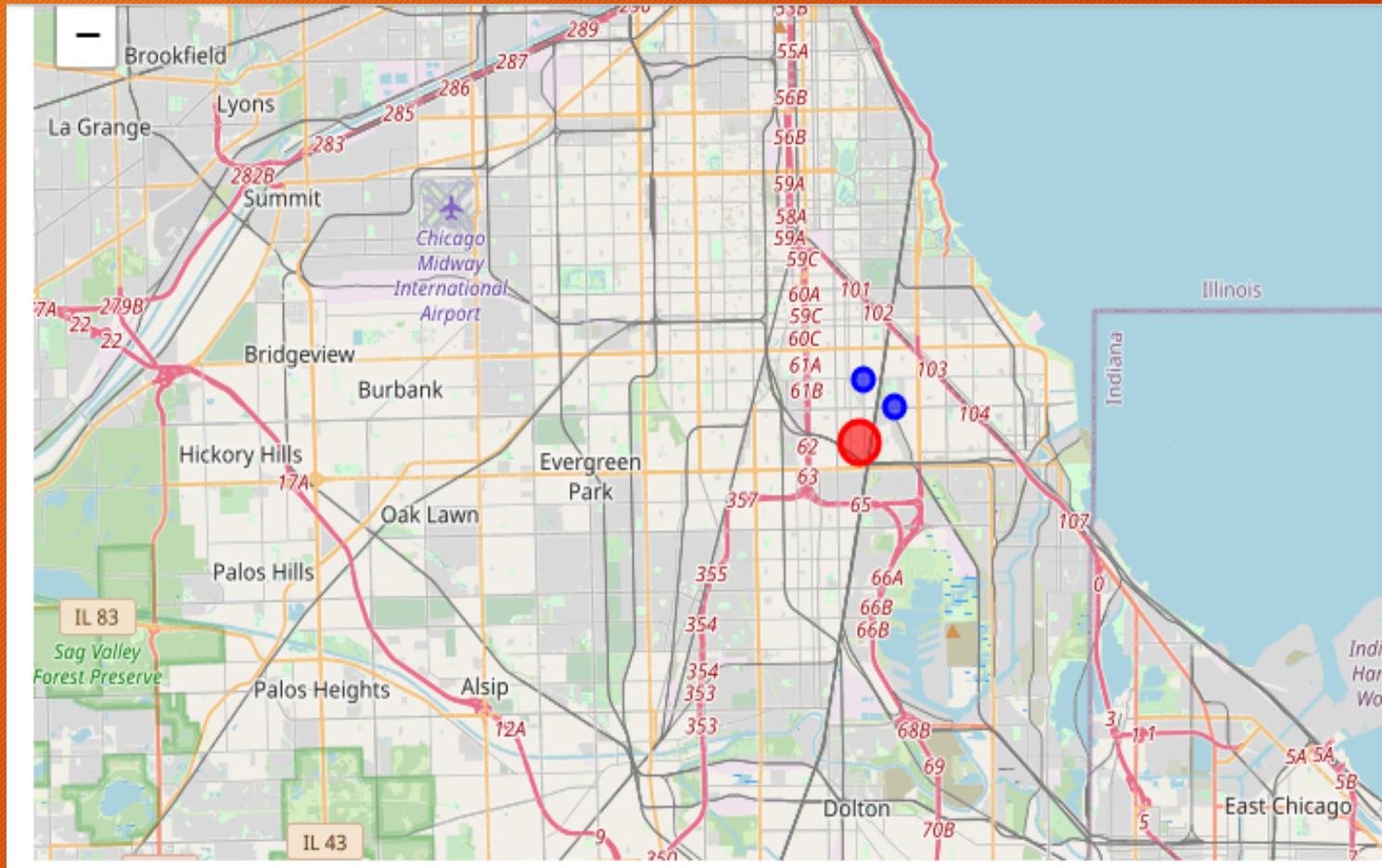


Methodology - Business Activity (Ashburn)



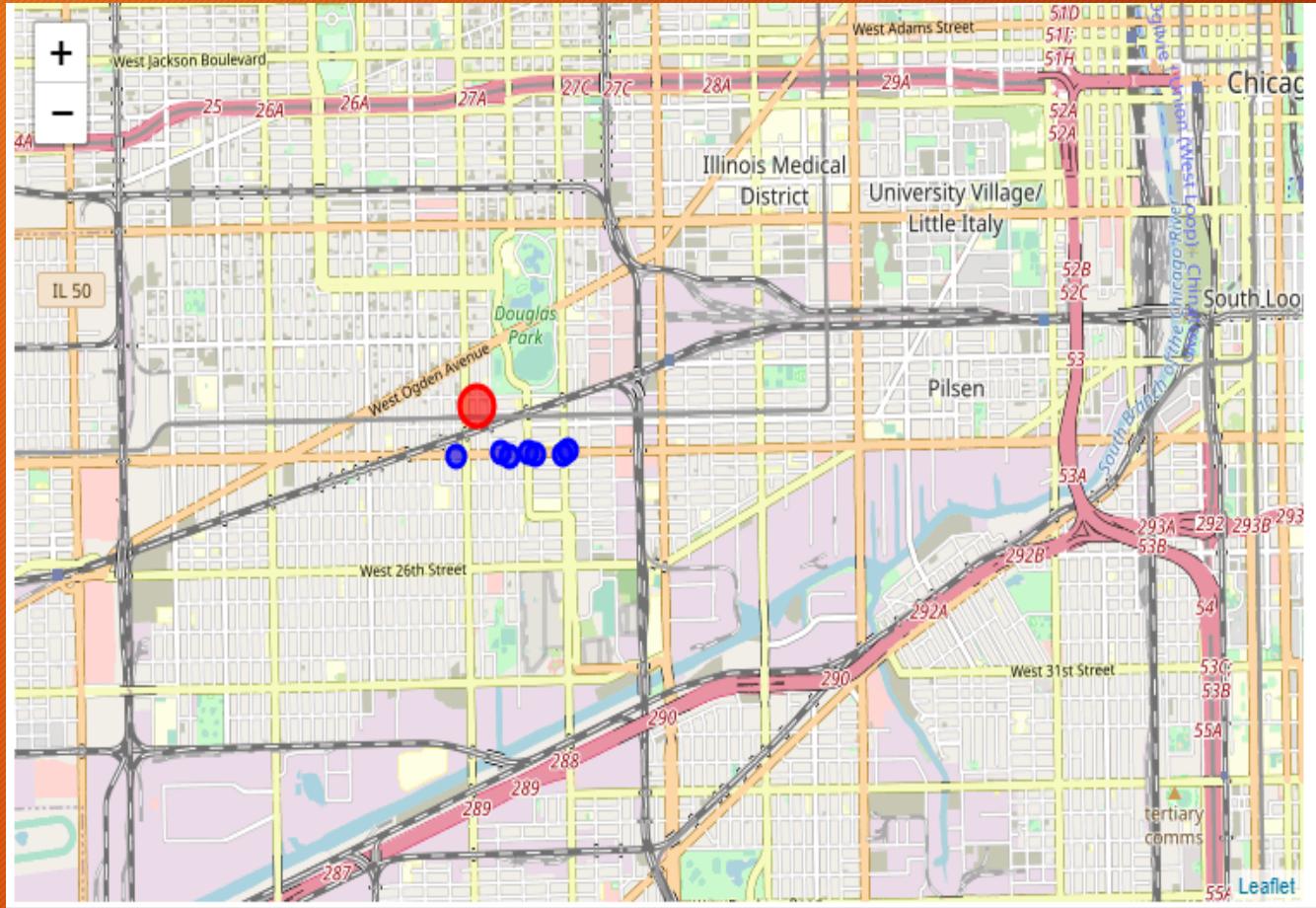
Restaurant Search
Map
Ashburn

Methodology - Business Activity (Chatham)



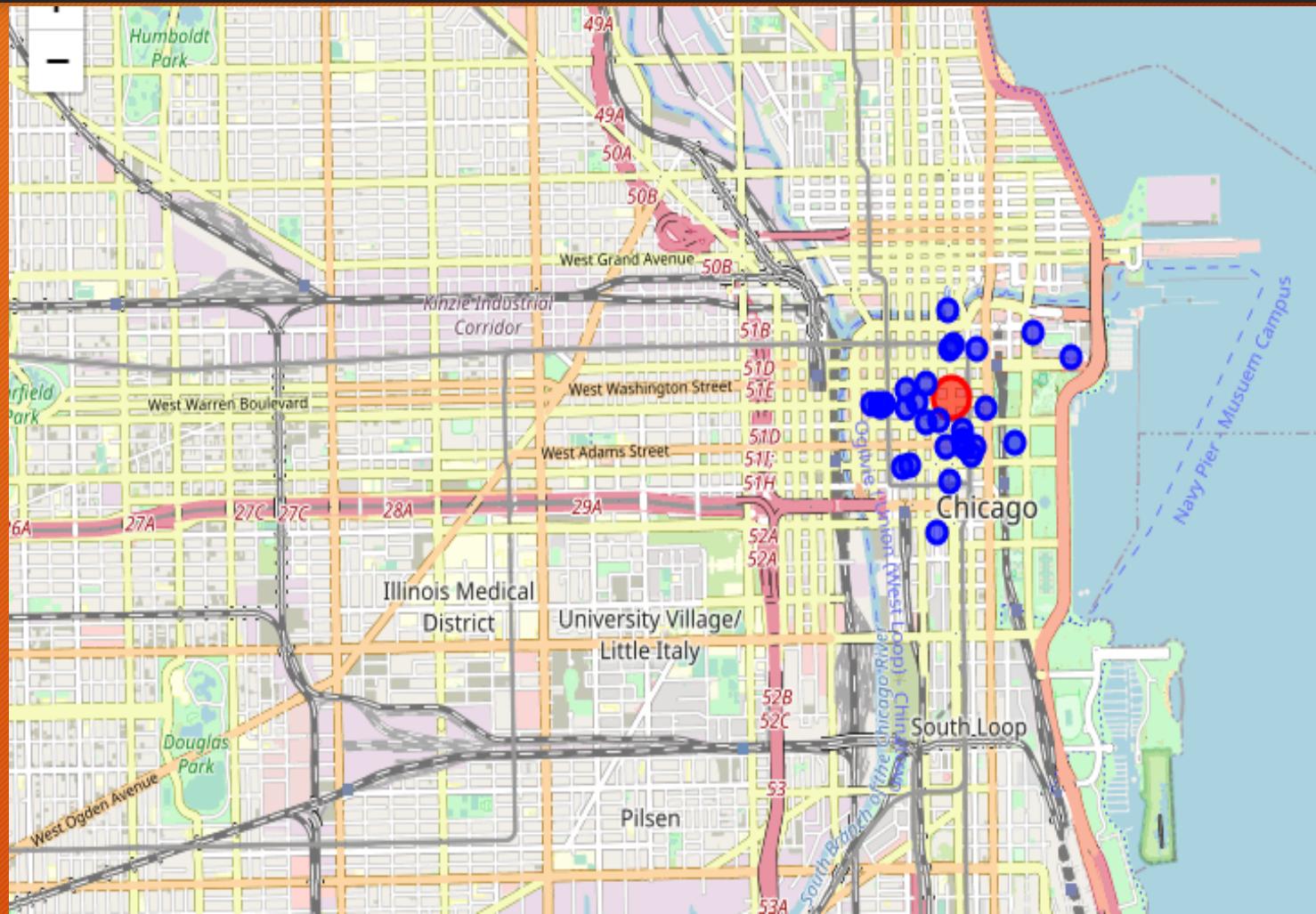
Restaurant
Search Map

Methodology - Business Activity (North Lawndale)



Restaurant
Search Map

Methodology - Business Activity (The Loop)



Restaurant
Search Map

Machine learning used

- Pandas and NumPy are extensively used for data structure and data analysis.
- Matplotlib is used for visual representation of data in different types of plotting
- SciPy is used for hypothesis testing - Chi Square test of goodness of fit.

Results - Crime Patterns

- Highest crime incidents - Austin
- Second highest incidents - South Shore
- Lowest crime incidents - Edison Park
- Highest Crime-type - Battery
- Second Crime-Type - Theft
- Highest Crime Date - Sundays
- Lowest Crime Date - Tuesdays
- Low Business Activities across all neighborhoods

Discussion

- Crime incidents are not evenly distributed across
 - Neighborhoods
 - Crime-types
 - Days-of-the-week
- Recommendations
 - More study on causes of high crimes in Austin and South Shore
 - Bigger and faster machine to study the entire dataset

Conclusion

- This study was focused on identifying crime patterns and business activities in the neighborhoods of the City of Chicago.
- There was a big difference in the neighborhoods. Austin and South Shore had very high crime numbers while Edison Park and Burnside had the lowest.
- The types of crimes were also not distributed evenly with battery and theft being the most common.
- There were more crimes incidents on Sundays than any other day. Overall there was low business activities in both high and low crime neighborhoods.