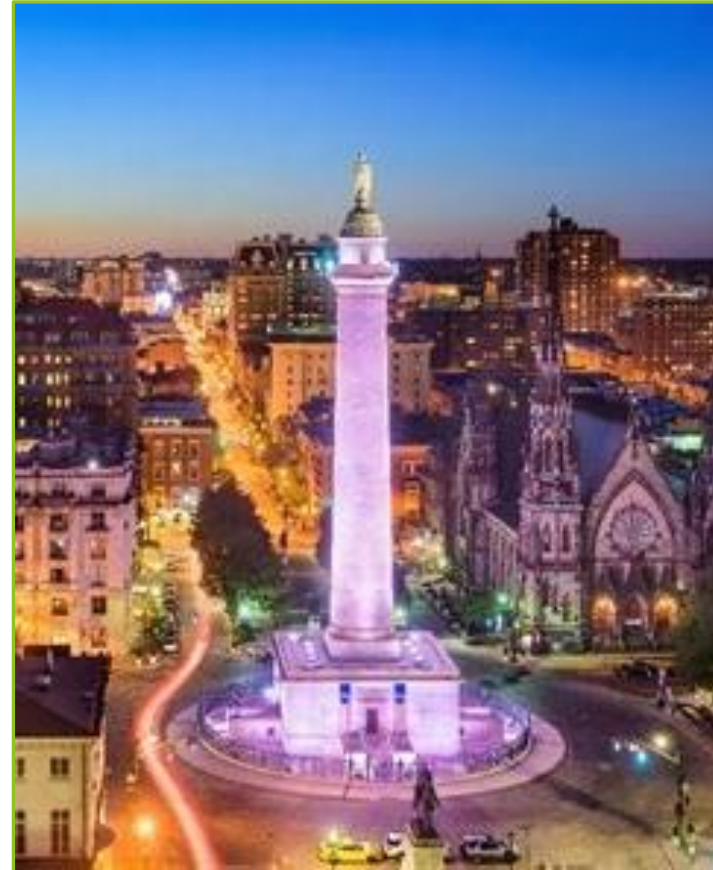


# Baltimore, Maryland

Neighborhoods Explored by Number of Crimes and Vacant Buildings

# Baltimore in Trouble

- ▶ “Charm City” has a shrinking population, high crime rate, and bleak outlook
- ▶ To explore the problems of the city we are looking at the relationship between
  - ▶ Number of Crimes
  - ▶ Number of Vacant Buildings
- ▶ Explore venues available in the top 5 neighborhoods by crime and vacant buildings



# Data

- ▶ Data comes from open city data for Baltimore City, Maryland

<https://data.baltimorecity.gov/>

- ▶ Crime Data

<https://data.baltimorecity.gov/Public-Safety/BPD-Part-1-Victim-Based-Crime-Data/wsfq-mvij/data>

- ▶ Vacant Building Data

<https://data.baltimorecity.gov/Housing-Development/Vacant-Buildings/qqcw-ihn5/data>

- ▶ Neighborhood GIS information

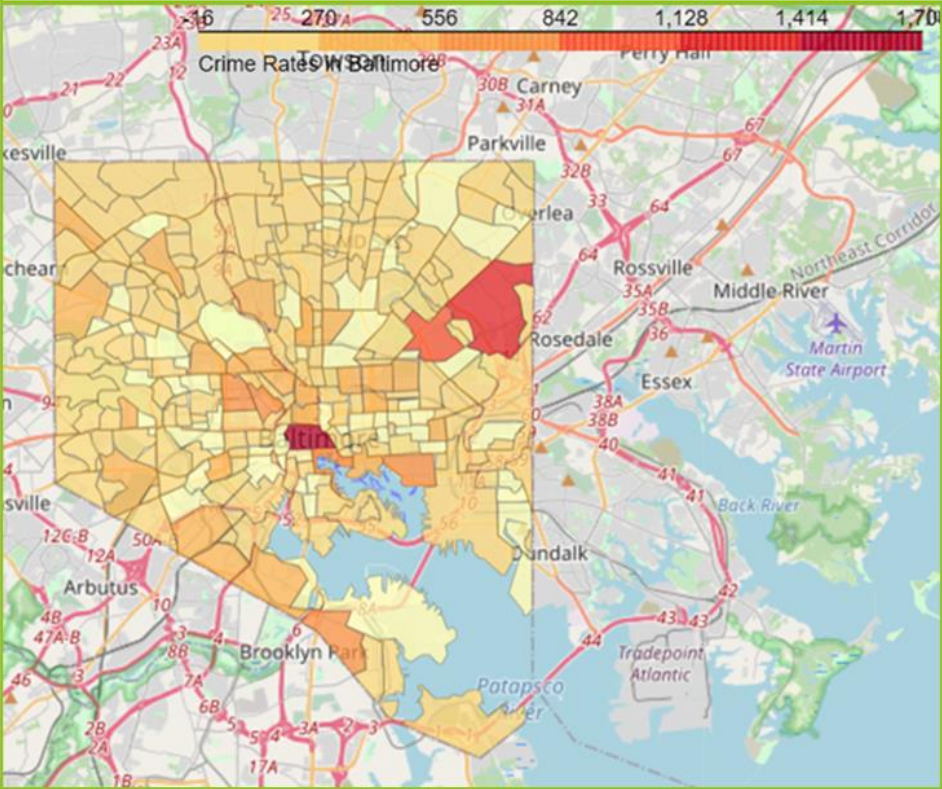
<https://data.baltimorecity.gov/Geographic/Neighborhoods/h8i5-gvdz>

- ▶ Foursquare

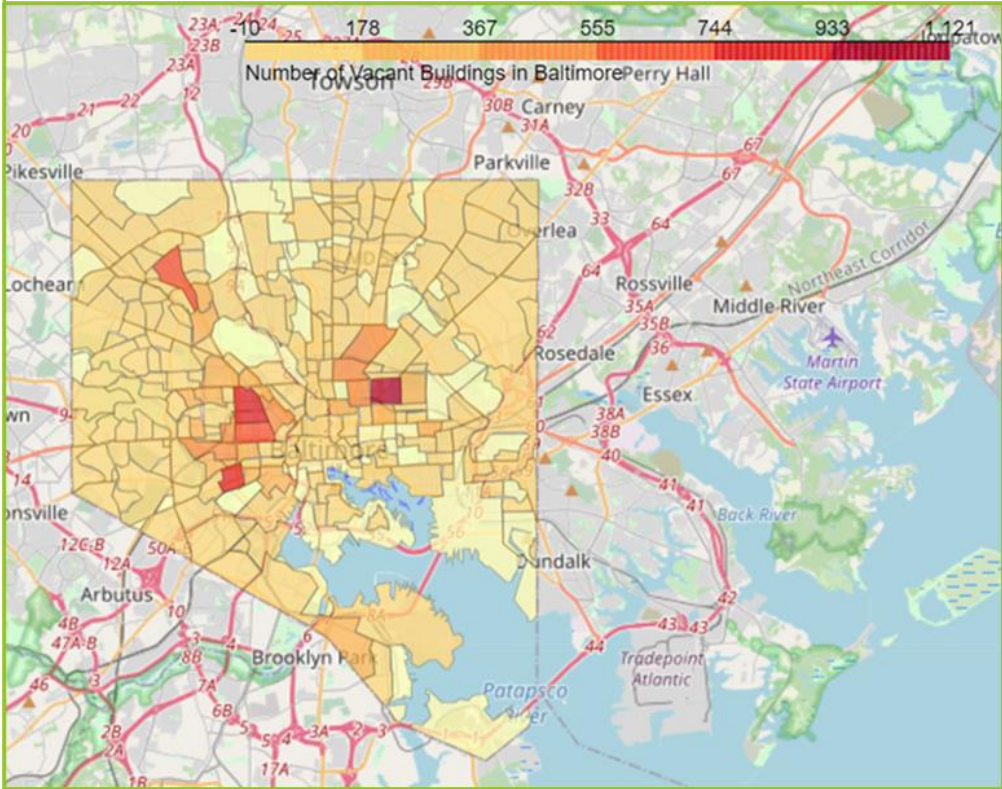
<https://api.foursquare.com>

# Crime vs Vacant Buildings

Number of Crimes by Neighborhood

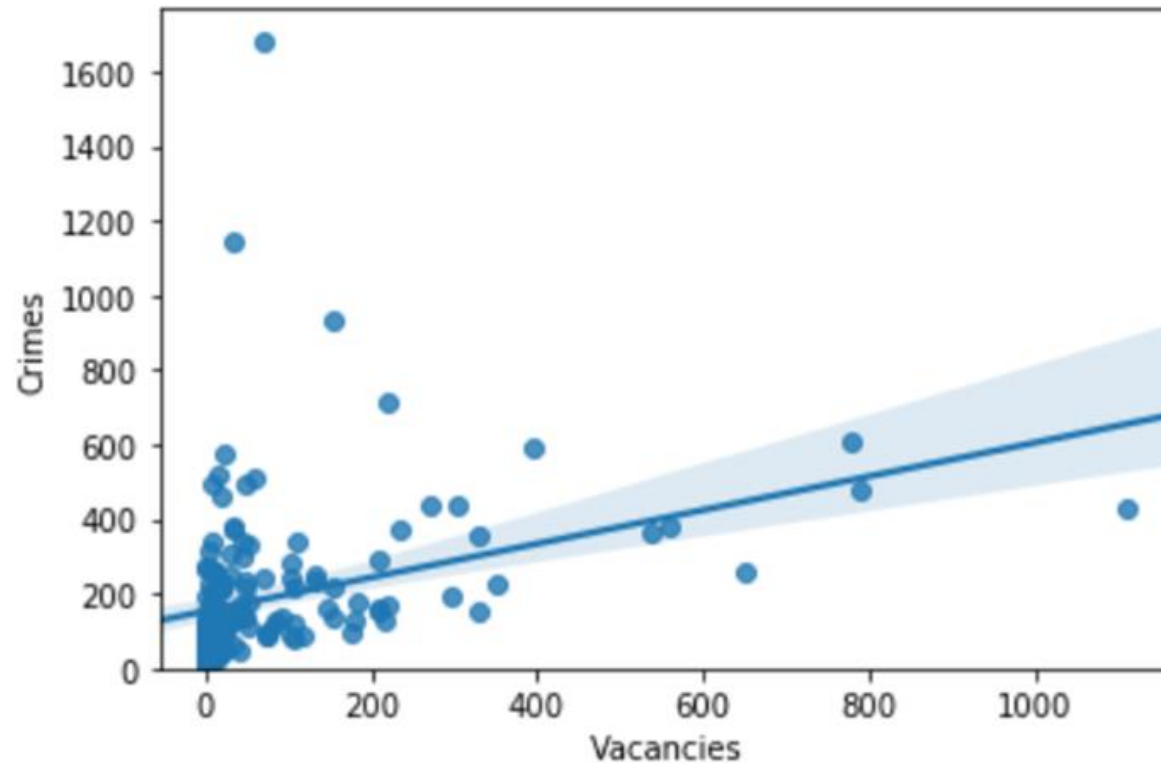


Number of Vacant Builders by Neighborhood



# Correlation?

- ▶ Maps show little overlap between high crime and high vacancies
- ▶ Using a regression model to view relationship
- ▶ Correlation coefficient of only 0.344
- ▶ WEAK CORRELATION



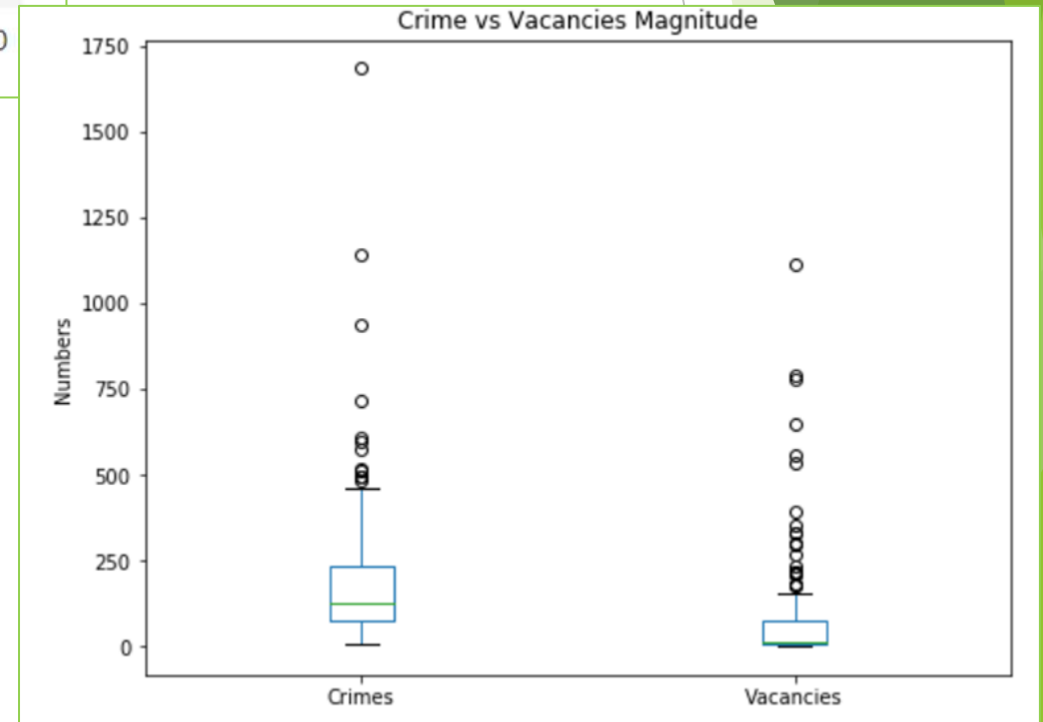


# Clusters

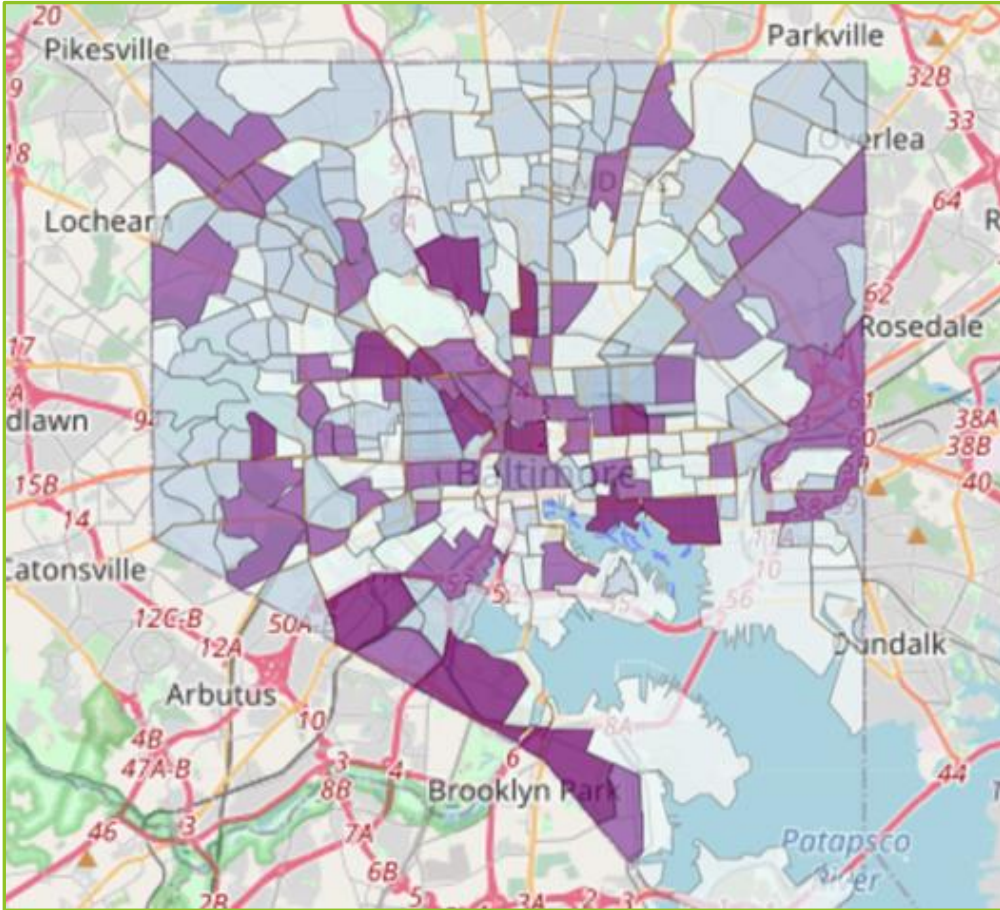
- ▶ K-cluster to group the neighborhoods
- ▶ Get the mean values for the labels
- ▶ Compare the numbers for crime and vacant buildings
- ▶ Create labels for each category

	Crimes	Vacancies
Cluster Labels		
0	84.902913	17.689320
1	420.000000	736.666667
2	1254.000000	86.666667
3	225.282609	96.260870
4	479.500000	142.000000

Cluster	Label
0	Low Crime, Low Vacancy
1	High Crime, High Vacancy
2	Highest Crime, Med Vacancy
3	Med Crime, Med Vacancy
4	High Crime, Med Vacancy



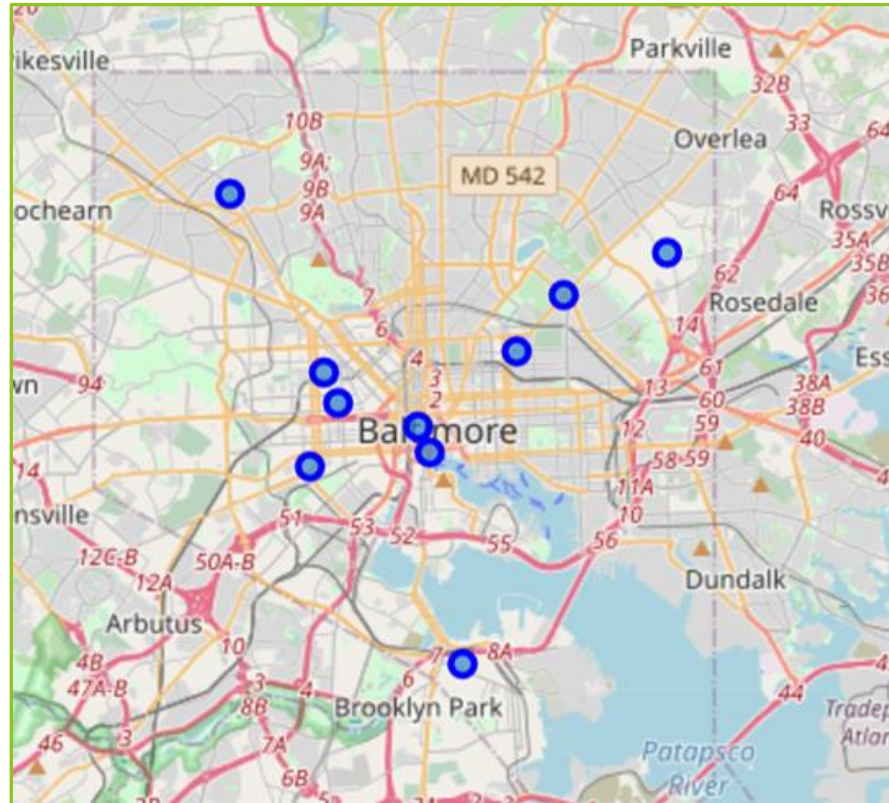
# Clusters Mapped



- ▶ Low Crime and Low Vacancy areas matched up which was expected
- ▶ Unexpected is that the Highest Crime areas had a Medium Vacancy number
- ▶ The Medium Vacancy number had crime Numbers in the Low, Medium, and High range
- ▶ Due to the weak correlation, that is not unexpected

# Exploring Neighborhoods

- ▶ Taking the top five neighborhoods by number of vacant buildings and number of crimes respectively
- ▶ Combine into one top ten neighborhoods of interest list





# Venues

- ▶ Neighborhoods of Interest have few venues with two exceptions

Neighborhood	Number of Venues
Belair-Edison	12
Broadway East	6
Brooklyn	6
Carrollton Ridge	15
Central Park Heights	5
Downtown	66
Frankford	3
Harlem Park	4
Inner Harbor	72
Sandtown-Winchester	5

- ▶ Downtown and Inner Harbor were pulled as top five neighborhood in terms of crime
- ▶ Crime may be a result of large number of people in neighborhood
- ▶ Most neighborhoods with high vacancy or high crime have few amenities

# Top Venues in Neighborhoods

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Belair-Edison - C	Fried Chicken Joint	Discount Store	Grocery Store	Chinese Restaurant	Food & Drink Shop
1	Broadway East - V	Lounge	Park	Food	Bar	Chinese Restaurant
2	Brooklyn - C	Fast Food Restaurant	Sandwich Place	Park	Pizza Place	Convenience Store
3	Carrollton Ridge - V	Seafood Restaurant	Grocery Store	Breakfast Spot	Intersection	Fish & Chips Shop
4	Central Park Heights - V	Deli / Bodega	Liquor Store	Park	Spa	Market
5	Downtown - C	Café	Theater	Pizza Place	Coffee Shop	Vietnamese Restaurant
6	Frankford - C	Convenience Store	Indian Restaurant	Chinese Restaurant	Vietnamese Restaurant	Exhibit
7	Harlem Park - V	Park	American Restaurant	Coffee Shop	Vietnamese Restaurant	Exhibit
8	Inner Harbor - C	Hotel	American Restaurant	Sandwich Place	Bar	Bank
9	Sandtown-Winchester - V	Bar	Convenience Store	Bakery	Plaza	Farmers Market

# Conclusion

- ▶ Weak correlation between crime number and number of vacant buildings
  - ▶ Unexpected result
  - ▶ Happens when modeling information
- ▶ Areas with high vacancy or high crime have few amenities
- ▶ Exception are two high tourist areas, Downtown and Inner Harbor
  - ▶ More exploration needed to determine if outliers
  - ▶ Possible high tourist areas attract crime
- ▶ Further Study
  - ▶ Compare type of crimes across neighborhoods
  - ▶ Determine true percentage of vacant buildings vs pure numbers