Prepared by: Mehmet Kaya

Battle of Buffalo Neighborhoods

Introduction

In this project, I will be exploring the neighborhoods in Buffalo, NY. Buffalo is the 2nd most populous city in the state of New York. It has recently been a major destination for many immigrants. I will try to see which neighborhood would be a good area for a business that is owned by an immigrant business person who is currently running a business in Brooklyn, NY.

This entrepreneur is considering moving his business to another city due to the high costs in Brooklyn, NY. Buffalo is the first option among the possible cities for this person along with Syracuse and Albany.

Data

I will be using data obtained from https://data.buffalony.gov/ . The data set I chose is called "Neighborhood Metrics". The link to the dataset is https://data.buffalony.gov/Economic-Neighborhood-Development/Neighborhood-Metrics/adai-75jt/data

This dataset is compiled by the Buffalo Urban Renewal Agency (BURA) from the 2017 American Community Survey (ACS), the premier source for detailed population and housing information about the nation. The ACS is an ongoing survey that provides vital information on a yearly basis about the nation and its people. More information on the survey is available at https://www.census.gov/programs-surveys/acs/data.html

Another dataset I will/might be using in this project is called the 311 Service Requests dataset. This is a dataset of 311 service requests for the City of Buffalo from July 2008 - present. 311 is a toll-free number reserved nationwide since 1997 for non-emergency calls to police and other government offices. The dataset is also available at https://data.buffalony.gov/Quality-of-Life/311-Service-Requests/whkc-e5vr/data

I will also use the Foursquare location data for the neighborhoods I will be exploring. The datasets mentioned above already have the longitude and latitude data. Using those geolocation data, I will explore the venues within those neighborhoods as well as the service calls received from those neighborhoods to arrive at a better-informed decision.

Methodology

I will first explore the neighborhoods on a map using the location data (latitudes and longitudes). I will use folium package for that. Folium offers great map visualizations for geographical data.

Once I have the neighborhoods displayed on a map, I will then use the location data again to pull out the businesses data in those neighborhoods using the Foursquare data through an API.

Foursquare is a technology company that built a massive dataset of location data. They smartly crowd-sourced their dataset through people using their mobile app and adding venues, which gradually turned into a one of the most comprehensive location dataset that feeds many popular services like Apple Maps, Uber, Snapchat, Twitter and many others.

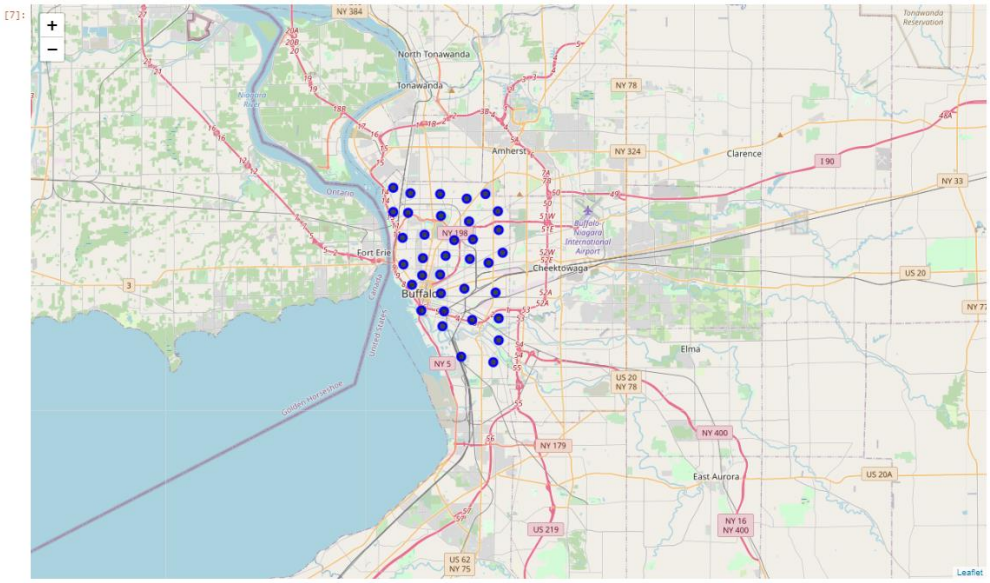
Finally, I will have a look at the service calls dataset to see what type of service calls were made from that neighborhood for a better-informed choice.

Results and Discussions.

A quick overview of the “Buffalo Neighborhood Metrics” dataset shows that there are 35 neighborhoods in Buffalo area and the latitude and longitude data for those neighborhoods are readily available in the same dataset.

First we obtained the geographical coordinates of Buffalo using Nominatim library by geopy. Once we had the latitude and longitude values of Buffalo, we then created a Buffalo map using the Folium library, then we superimposed the neighborhoods on the Buffalo map as markers using their location data through a for loop.

This is what we got:



Then we moved on to exploring the business venues in those neigborhoods. Foursquare date came in very handy at this step. Using the geographical coordinates data we had, we created a function called “getNearbyVenues”, which iterated over all the 35 neighborhoods and pulled out the list of venues within a radius of 500 meters of each neighborhood center using the API. The API request also pulled the geographical coordinates and the venue category (restaurant, hockey arena etc.) of each venue pulled. Once we had that data, we converted it into a table (a data frame so to speak) and this is what it looked like:

[46]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Central	42.875966	-78.877250	Canalside	42.877058	-78.878826	Event Space
1	Central	42.875966	-78.877250	Buffalo Marriott at LECOM HARBORCENTER	42.876817	-78.877066	Hotel
2	Central	42.875966	-78.877250	KeyBank Center	42.875259	-78.876571	Hockey Arena
3	Central	42.875966	-78.877250	Buffalo & Erie County Naval & Military Park	42.878157	-78.879793	Museum
4	Central	42.875966	-78.877250	LECOM Harborcenter	42.876612	-78.876661	Hockey Rink
...	...	...	...	...	...	...	...
371	Kensington-Bailey	42.939776	-78.809881	Dollar General	42.938669	-78.813275	Discount Store
372	Kensington-Bailey	42.939776	-78.809881	Bailey Jewelry	42.939295	-78.813772	Jewelry Store
373	Kensington-Bailey	42.939776	-78.809881	Rent-A-Center	42.940557	-78.813885	Electronics Store
374	Kensington-Bailey	42.939776	-78.809881	Golden Farm	42.940922	-78.805713	Convenience Store
375	Kensington-Bailey	42.939776	-78.809881	Captain Of The Sea	42.937445	-78.813965	Seafood Restaurant

376 rows × 7 columns

After this, we had a quick overview of the counts of each unique category across all districts. Here is how it looked like:

[49]:

Venue Category	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude
Bar	20	20	20	20	20	20
Coffee Shop	15	15	15	15	15	15
Convenience Store	14	14	14	14	14	14
Pizza Place	12	12	12	12	12	12
Discount Store	11	11	11	11	11	11
...	...	...	...	...	...	...
Food	1	1	1	1	1	1
Farmers Market	1	1	1	1	1	1
Ethiopian Restaurant	1	1	1	1	1	1
Eastern European Restaurant	1	1	1	1	1	1
Women's Store	1	1	1	1	1	1

145 rows × 6 columns

When we analyze the neighborhoods , we saw that the most common 10 venue categories in each neighborhood were using onehot coding (dummies) and looking at the frequency of occurrence of each venue category. This is how it looked:

[51]:

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	...	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Allentown	Bar	Gay Bar	Sandwich Place	Coffee Shop	...	Dive Bar	American Restaurant	Italian Restaurant	Mexican Restaurant	Cuban Restaurant
1	Black Rock	Deli / Bodega	Pizza Place	Seafood Restaurant	Harbor / Marina	...	Discount Store	Music Venue	Convenience Store	Pharmacy	Gourmet Shop
2	Broadway Fillmore	Pizza Place	Bank	Intersection	Electronics Store	...	Discount Store	Middle Eastern Restaurant	Convenience Store	Park	Bowling Alley
3	Central	Hockey Arena	Lounge	Bar	Hotel	...	Souvenir Shop	Comedy Club	Gastropub	New American Restaurant	Museum
4	Central Park	Coffee Shop	Park	Liquor Store	Intersection	...	Convenience Store	Construction & Landscaping	Cosmetics Shop	Cuban Restaurant	Cycle Studio
...	...	...	...	...	...	...	...	...	...	...	...
29	South Park	Coffee Shop	Bookstore	Pharmacy	Park	...	Dive Bar	Discount Store	Diner	Dessert Shop	Deli / Bodega
30	University Heights	Coffee Shop	Intersection	Comic Shop	Ramen Restaurant	...	Café	Convenience Store	Sandwich Place	Dessert Shop	Smoke Shop
31	Upper West Side	Photography Studio	Lounge	Discount Store	Mexican Restaurant	...	Bakery	Sports Bar	Restaurant	Café	Furniture / Home Store
32	West Hertel	Liquor Store	Baseball Field	Breakfast Spot	Office	...	Dessert Shop	Donut Shop	Dive Bar	Discount Store	Diner
33	West Side	Vietnamese Restaurant	Duty-free Shop	Sporting Goods Shop	Grocery Store	...	Cheese Shop	Convenience Store	Café	Bus Stop	Market

34 rows × 11 columns

For the most part, coffee shops and eateries were the most common venues in the neighborhoods and a variety of categories as the second most common venues.

Conclusion

We see that the West Side the most common venue category is Vietnamese restaurants. This means that there might be a big Vietnamese as well as other Asian communities in and around that neighborhood.

As the entrepreneur is of Asian origin, a neighborhood with Asian communities would be a good place to consider starting businesses as this translates into a better customer potential for the services and products his business has to offer.

The service calls analysis showed that the neighborhood is not one with much issues, too. Out of 52033 total calls from all 35 neighborhoods, West Side had only 8 calls and two of them were to do with parking issues, two with police issues and five with pot hole issues. Therefore, it can be a good neighborhood to start with his business ventures.

All Neighborhoods Calls

[76]:

	CASE REFERENCE	OPEN DATE	CLOSED DATE	STATUS	SUBJECT	...	CENSUS BLOCK GROUP	CENSUS BLOCK	NEIGHBORHOOD	X COORDINATE	Y COORDINATE
3	1000522604	04/23/2016 11:07:00 AM	04/26/2016 08:37:00 AM	Closed	Dept of Parking	...	3	3004	UNKNOWN	1.077774e+06	1.068492e+06
4	1000522606	04/23/2016 11:11:00 AM	04/29/2016 06:08:00 AM	Closed	Utilities	...	1	1008	UNKNOWN	1.078086e+06	1.070703e+06
25	1000522640	04/25/2016 08:40:00 AM	04/29/2016 03:21:00 PM	Closed	Dept of Public Works	...	1	1012	UNKNOWN	1.063416e+06	1.072447e+06
32	1000522649	04/25/2016 08:48:00 AM	04/26/2016 10:29:00 AM	Closed	Buffalo Police Department	...	1	1000	UNKNOWN	1.082742e+06	1.070988e+06
37	1000522654	04/25/2016 08:53:00 AM	05/13/2016 08:36:00 AM	Closed	Dept of Public Works	...	1	1017	UNKNOWN	1.077104e+06	1.049374e+06
...	...	...	...	...	...	...	...	...	...	...	...
837188	1001310640	11/16/2020 01:43:00 PM	11/17/2020 03:01:00 PM	Closed	Dept of Public Works	...	6	6000	UNKNOWN	1.080463e+06	1.074992e+06
837204	1001310783	11/16/2020 04:00:00 PM	11/17/2020 03:01:00 PM	Closed	Dept of Public Works	...	1	1075	UNKNOWN	1.070869e+06	1.051319e+06
837220	1001310885	11/17/2020 09:26:00 AM	11/17/2020 11:04:00 AM	Closed	Dept of Public Works	...	3	3002	UNKNOWN	1.084278e+06	1.060074e+06
837240	1001311051	11/17/2020 12:04:00 PM	11/17/2020 02:10:00 PM	Closed	Dept of Law	...	4	4007	UNKNOWN	1.080291e+06	1.052974e+06
837308	428226-1001311416	11/18/2020 12:31:00 PM	11/26/2020 06:28:00 AM	Closed	Buffalo Police Department	...	1	1006	UNKNOWN	-7.886686e+01	4.293634e+01

52033 rows × 26 columns

West Side Calls

[69]:

		0
NEIGHBORHOOD	**TYPE**	
Allentown	**Illegal Dumping Street (Req_Serv)**	1
	Parking Issues (Req_Serv)	2
	Pot Hole (Req_Serv)	2
	Sign Maintenance (Req_Serv)	1
Black Rock	**Pot Hole (Req_Serv)**	3
...	**...**	...
Upper West Side	**Water Issue (Req_Serv)**	1
West Hertel	**Pot Hole (Req_Serv)**	4
West Side	**Parking Issues (Req_Serv)**	1
	Police Issue (Req_Serv)	2
	Pot Hole (Req_Serv)	5