

Battle of Neighborhoods

Pharmacy @ Brooklyn

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1. Introduction

1.1 Background

This is a Data Science Project – “The Battle of Neighborhood – Most Pharmacies around Brooklyn”

1.2 Business Problem

We have a client – A Doctor and a Medical Representative who have been given an assignment to go to New York, Brooklyn and have been asked to set up private Hospitals around the same. They need to find an area that will yield maximum output and they can treat the patients efficiently.

Now this effectively means that we need to find out locations that have most Pharmacies and these can be ideal place to set up Hospitals

1.3 Audience

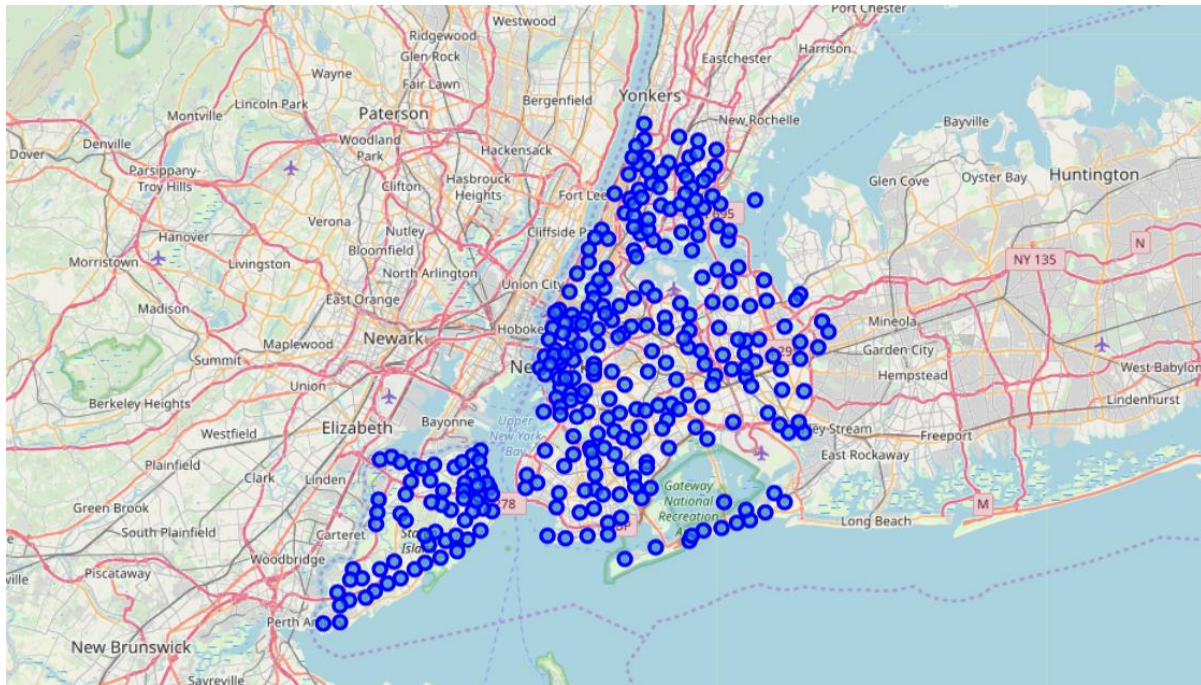
This project will be useful for them as we will try to find out the locations around Brooklyn where we have maximum “Pharmacies” or they have “Pharmacy” as most common venue.

In the future, this data will be useful for any Doctors or MR’s around the world who are interested to set up Hospital in a particular area with Pharmacy as the common location or maximum number of Pharmacies in any particular neighborhood. In this case the area of investigation is Brooklyn and its neighborhoods

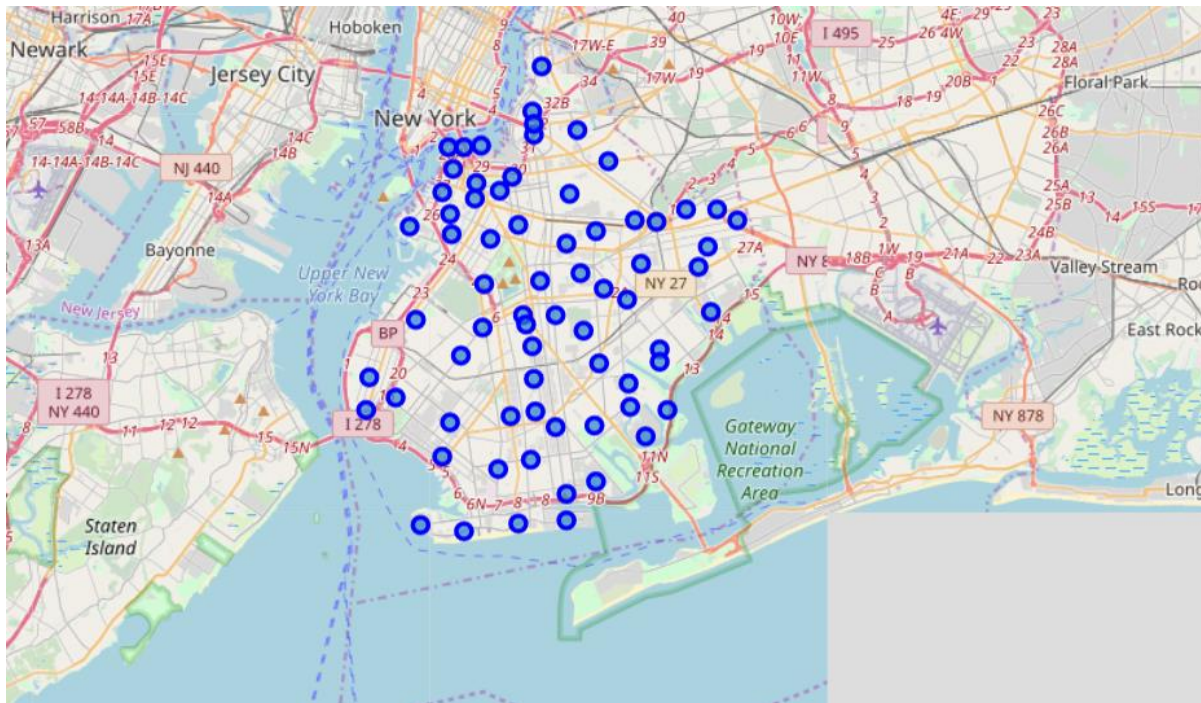
2. Data set

We will use New York Data set that is readily available on the web. In this Data set we have 5 boroughs and 306 neighborhoods. Features key of the Data set has all the relevant information. This data set is then transformed to Pandas Data frame.

First, we plot New York map with neighborhoods superimposed on Top (Visualize using Folium Maps)



Since we are interested in Brooklyn data set we further explore Brooklyn and its neighborhoods



3. Data cleaning

Run the above function on each neighborhood and create a new dataframe called `brooklyn_venues`.

```
brooklyn_venues = getNearbyVenues(names=brooklyn_data['Neighborhood'],
                                  latitudes=brooklyn_data['Latitude'],
                                  longitudes=brooklyn_data['Longitude']
                                  )
```

```
Bay Ridge
Bensonhurst
Sunset Park
Greenpoint
Gravesend
Brighton Beach
Sheepshead Bay
Manhattan Terrace
Flatbush
Crown Heights
East Flatbush
Kensington
```

Check resulting dataframe

```
print(brooklyn_venues.shape)
brooklyn_venues.head()
```

(2820, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Bay Ridge	40.625801	-74.030621	Pilo Arts Day Spa and Salon	40.624748	-74.030591	Spa
1	Bay Ridge	40.625801	-74.030621	Bagel Boy	40.627896	-74.029335	Bagel Shop
2	Bay Ridge	40.625801	-74.030621	Cocoa Grinder	40.623967	-74.030863	Juice Bar
3	Bay Ridge	40.625801	-74.030621	Pegasus Cafe	40.623168	-74.031186	Breakfast Spot
4	Bay Ridge	40.625801	-74.030621	Ho' Brah Taco Joint	40.622960	-74.031371	Taco Place

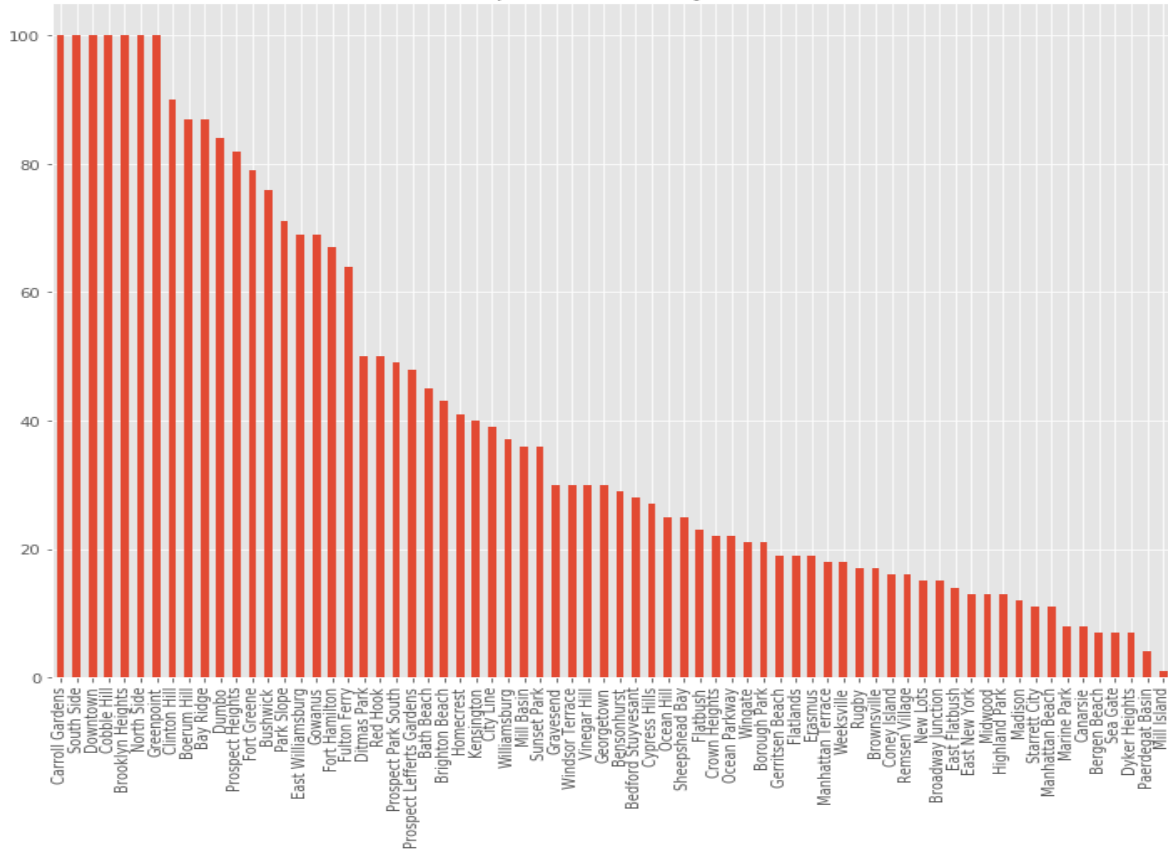
4. Data Analysis

4.1 Top Venues

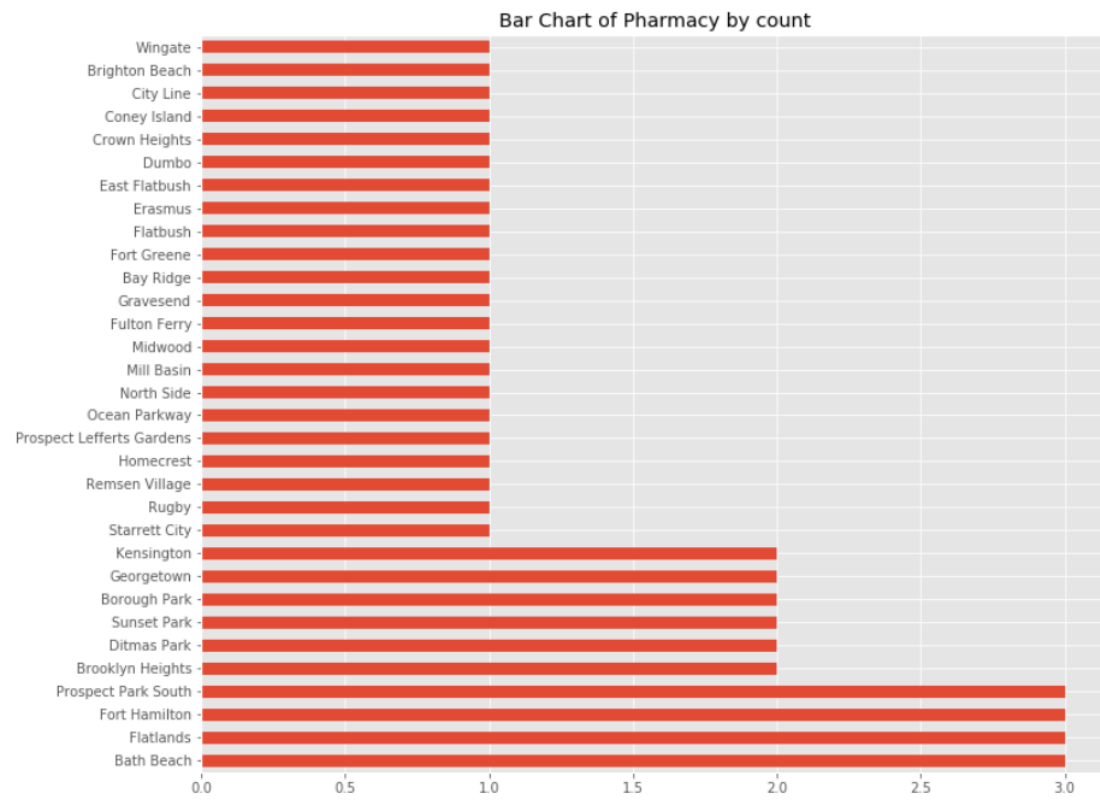
We start analyzing the data by showing the number of Venues and hence max Venues which gives us an idea on populated venues.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
54	Bay Ridge	40.625801	-74.030621	Duane Reade	40.622093	-74.027629	Pharmacy
139	Sunset Park	40.645103	-74.010316	Duane Reade	40.645010	-74.010777	Pharmacy
146	Sunset Park	40.645103	-74.010316	Rite Aid	40.643625	-74.012141	Pharmacy
259	Gravesend	40.595260	-73.973471	Rite Aid	40.596756	-73.975457	Pharmacy
295	Brighton Beach	40.576825	-73.965094	Duane Reade	40.576594	-73.967761	Pharmacy
388	Flatbush	40.636326	-73.958401	Rite Aid	40.635575	-73.963514	Pharmacy
407	Crown Heights	40.670829	-73.943291	Rite Aid	40.671123	-73.943461	Pharmacy
415	East Flatbush	40.641718	-73.936103	Rite Aid	40.641799	-73.937224	Pharmacy
461	Kensington	40.642382	-73.980421	Walgreens	40.642677	-73.978856	Pharmacy
463	Kensington	40.642382	-73.980421	Rite Aid	40.643536	-73.977317	Pharmacy
798	Brooklyn Heights	40.695864	-73.993782	City Chemist	40.694819	-73.994161	Pharmacy
814	Brooklyn Heights	40.695864	-73.993782	CVS/Pharmacy	40.694148	-73.992434	Pharmacy
1234	Fort Greene	40.688527	-73.972906	Prospect Pharmacy	40.686207	-73.968276	Pharmacy
1346	Starrett City	40.647589	-73.879370	CVS pharmacy	40.647316	-73.882990	Pharmacy
1373	Flatlands	40.630446	-73.929113	CVS pharmacy	40.634008	-73.928620	Pharmacy
1374	Flatlands	40.630446	-73.929113	Rite Aid	40.628947	-73.927587	Pharmacy
1375	Flatlands	40.630446	-73.929113	Walgreens	40.626656	-73.928006	Pharmacy
1410	Coney Island	40.574293	-73.988683	Mermaid Pharmacy	40.577906	-73.986515	Pharmacy
1439	Bath Beach	40.599519	-73.998752	Rite Aid	40.602191	-73.999149	Pharmacy
1440	Bath Beach	40.599519	-73.998752	CVS pharmacy	40.599943	-74.002568	Pharmacy
1451	Bath Beach	40.599519	-73.998752	CVS pharmacy	40.602583	-73.994691	Pharmacy

Box plot of Venues by count



4.2 Venues with number of Pharmacy locations



4.3 Venues with most common location as Pharmacy

Find out which locations have Pharmacy as the most common location

```
df1 = neighborhoods_venues_sorted[neighborhoods_venues_sorted['1st Most Common Venue'].str.contains("Pharmacy")]
df1
```

	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	Bath Beach	Pharmacy	Chinese Restaurant	Sushi Restaurant	Bubble Tea Shop	Pizza Place	Donut Shop	Fast Food Restaurant	Kids Store	Italian Restaurant	Cantonese Restaurant
29	Flatlands	Pharmacy	Caribbean Restaurant	Fast Food Restaurant	Deli / Bodega	Fried Chicken Joint	Discount Store	Bar	Video Store	Nightclub	Electronics Store

Find out which locations have Pharmacy as the 2nd most common location

```
df2 = neighborhoods_venues_sorted[neighborhoods_venues_sorted['2nd Most Common Venue'].str.contains("Pharmacy")]
df2
```

	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
31	Fort Hamilton	Deli / Bodega	Pharmacy	Chinese Restaurant	Sandwich Place	Bank	Bagel Shop	Diner	Cocktail Bar	Pub	Japanese Restaurant
33	Georgetown	Bank	Pharmacy	Breakfast Spot	Donut Shop	Pizza Place	Shopping Mall	Burger Joint	Shipping Store	Sandwich Place	Clothing Store
56	Prospect Park South	Caribbean Restaurant	Pharmacy	Fast Food Restaurant	Grocery Store	Pizza Place	Donut Shop	Mobile Phone Shop	Latin American Restaurant	Fried Chicken Joint	Mexican Restaurant

Find out which locations have Pharmacy as the 3rd most common location

```
df3 = neighborhoods_venues_sorted[neighborhoods_venues_sorted['3rd Most Common Venue'].str.contains("Pharmacy")]
df3
```

	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
20	Ditmas Park	Deli / Bodega	Pizza Place	Pharmacy	Kids Store	Caribbean Restaurant	Chinese Restaurant	Donut Shop	Discount Store	Women's Store	Japanese Restaurant

Finally - Concluding the Neighborhoods that have Pharmacy as most common Venue

```
print ("\n""The Neighborhoods of Brooklyn that have Pharmacy as most common Venues among top 3 are:""\n")
print(df1.Neighborhood[0])
print(df1.Neighborhood[29])
print(df2.Neighborhood[31])
print(df2.Neighborhood[33])
print(df2.Neighborhood[56])
print(df3.Neighborhood[20])
```

The Neighborhoods of Brooklyn that have Pharmacy as most common Venues among top 3 are:

Bath Beach
Flatlands
Fort Hamilton
Georgetown
Prospect Park South
Ditmas Park

5. Conclusion

We carried out analysis with help of Data frame containing Brooklyn's Pharmacy location

Each of the neighborhoods that had "Pharmacy" were shown, then we plotted Bar chart showing count of "Pharmacy" locations

- ☐ This helped to show high number of such location
- ☐ This concluded one area of analysis
- ☐ Another analysis we did was around Pharmacy as most common location

- ☐ Though this may not be count-wise, we still got an idea on such locations in terms of availability frequency
- ☐ Hence if you see we have shown results from both methods
- ☐ Conclusive results for Doctors and Medical Representatives to set up Hospitals – Below are the locations with most common venue as Pharmacy

- ☐ **Bath Beach**
- ☐ **Flatlands**
- ☐ **Fort Hamilton**
- ☐ **Georgetown**
- ☐ **Prospect Park South**
- ☐ **Ditmas Park**

