

Capstone Project

The battle of neighborhoods

Where is it better to open a restaurant in NYC for ABC Company ?



Introduction

ABC Company wants to open a restaurant in NYC. But before doing that, they asked us to analyse the situation in NYC through data.

We will look at every neighborhoods in NYC to see where is it better to open a restaurant, by analysing a few Key points of interest (KPI).

Problem to solve



Choose a neighborhood with both low competition, high demand and a wide choice of menu. Also, it would be good if this method could be easy to replicate for further development by ABC

The issue to answer to



What is the best place to open a restaurant regarding our Key Point of Interests?

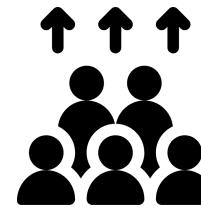
What are the KPI we will look at before choosing the neighborhood?



Demographics



Presence of farmers, markets, to keep the prices of raw food bought low



Population



Entertainment places attracting a lot of people



Competition



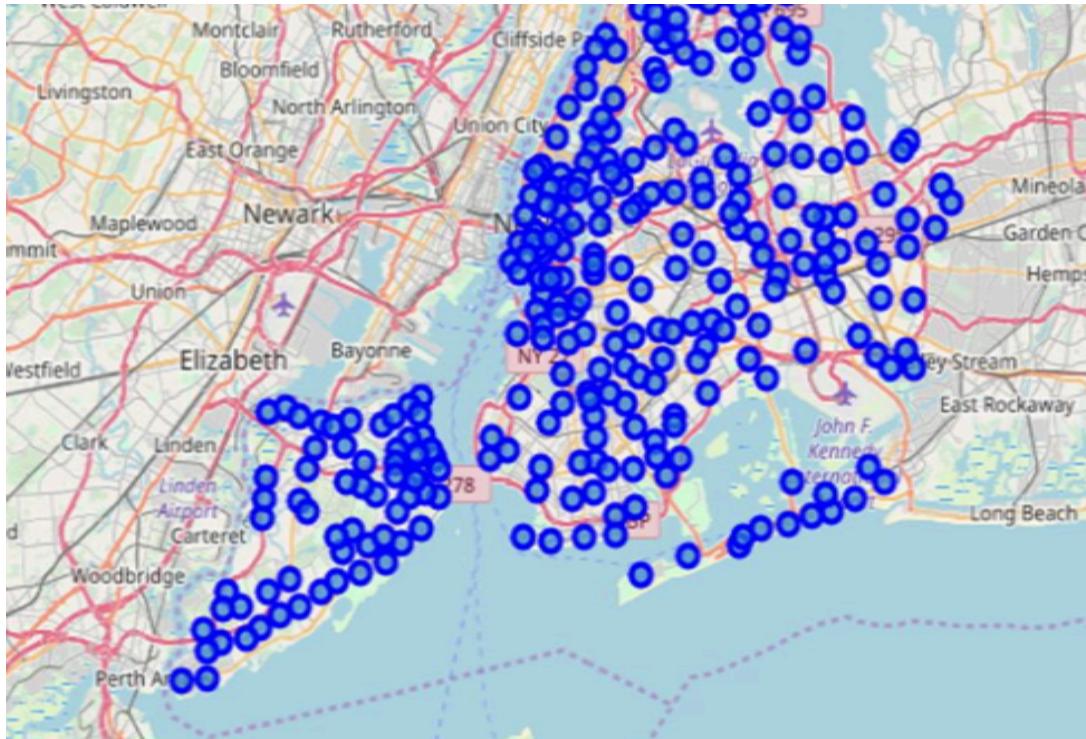
Unstapped market/
Business opportunity

Data description

	I	II	III	IV																																																																																															
Link	https://geo.nyu.edu/catalog/nyu_2451_34572	https://data.cityofnewyork.us/dataset/DOHMH-Farmers-Markets/8vkw-6iz2	https://en.wikipedia.org/wiki/New_York_City https://en.wikipedia.org/wiki/Economy_of_New_York_City https://en.wikipedia.org/wiki/Portal:New_York_City https://en.wikipedia.org/wiki/Cuisine_of_New_York_City	https://fr.foursquare.com/																																																																																															
Description	Dataset that contains the boroughs & neighborhoods with latitudes and longitudes	Description of type of products sold by markets	Population, Demographics, Cuisine	Coordinates data																																																																																															
Picture	 <table border="1"> <thead> <tr> <th>Borough</th><th>Neighborhood</th><th>Latitude</th><th>Longitude</th></tr> </thead> <tbody> <tr> <td>0 Bronx</td><td>Wakefield</td><td>40.894705</td><td>-73.847201</td></tr> <tr> <td>1 Bronx</td><td>Co-op City</td><td>40.874294</td><td>-73.829939</td></tr> <tr> <td>2 Bronx</td><td>Eastchester</td><td>40.887556</td><td>-73.827806</td></tr> <tr> <td>3 Bronx</td><td>Fieldston</td><td>40.895437</td><td>-73.905643</td></tr> <tr> <td>4 Bronx</td><td>Riverdale</td><td>40.890834</td><td>-73.912585</td></tr> </tbody> </table>	Borough	Neighborhood	Latitude	Longitude	0 Bronx	Wakefield	40.894705	-73.847201	1 Bronx	Co-op City	40.874294	-73.829939	2 Bronx	Eastchester	40.887556	-73.827806	3 Bronx	Fieldston	40.895437	-73.905643	4 Bronx	Riverdale	40.890834	-73.912585	 <table border="1"> <thead> <tr> <th>FacilityName</th><th>ServiceCategory</th><th>Service_Type</th><th>Address</th><th>Address2</th><th>Borough</th><th>ZipCode</th></tr> </thead> <tbody> <tr> <td>Inwood Park Greenmarket</td><td>Farmers Markets and Food Boxes</td><td>Farmers Markets</td><td>Isham St bet Seaman & Cooper</td><td></td><td>Nan Manhattan</td><td>10034</td></tr> <tr> <td>82nd Street Greenmarket</td><td>Farmers Markets and Food Boxes</td><td>Farmers Markets</td><td>82nd St bet 1st & York Aves</td><td></td><td>Nan Manhattan</td><td>10028</td></tr> <tr> <td>125th Street Farmers Market</td><td>Farmers Markets and Food Boxes</td><td>Farmers Markets</td><td>125th St & Adam Clayton Powell Jr Blvd</td><td></td><td>Nan Manhattan</td><td>10027</td></tr> <tr> <td>170 Farm Stand</td><td>Farmers Markets and Food Boxes</td><td>Farmers Markets</td><td>170th St & Townsend Ave</td><td></td><td>Nan Bronx</td><td>10452</td></tr> <tr> <td>175th Street Greenmarket</td><td>Farmers Markets and Food Boxes</td><td>Farmers Markets</td><td>175th St bet Wadsworth Ave & Broadway</td><td></td><td>Nan Manhattan</td><td>10033</td></tr> </tbody> </table>	FacilityName	ServiceCategory	Service_Type	Address	Address2	Borough	ZipCode	Inwood Park Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	Isham St bet Seaman & Cooper		Nan Manhattan	10034	82nd Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	82nd St bet 1st & York Aves		Nan Manhattan	10028	125th Street Farmers Market	Farmers Markets and Food Boxes	Farmers Markets	125th St & Adam Clayton Powell Jr Blvd		Nan Manhattan	10027	170 Farm Stand	Farmers Markets and Food Boxes	Farmers Markets	170th St & Townsend Ave		Nan Bronx	10452	175th Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	175th St bet Wadsworth Ave & Broadway		Nan Manhattan	10033	 <table border="1"> <thead> <tr> <th>Racialcomposition</th><th>2010</th><th>1990</th><th>1970</th><th>1940</th></tr> </thead> <tbody> <tr> <td>White</td><td>44.0%</td><td>52.3%</td><td>76.6%</td><td>93.6%</td></tr> <tr> <td>—Non-Hispanic</td><td>33.3%</td><td>43.2%</td><td>62.9%</td><td>92.0%</td></tr> <tr> <td>Black or African American</td><td>25.5%</td><td>28.7%</td><td>21.1%</td><td>6.1%</td></tr> <tr> <td>Hispanic or Latino (of any race)</td><td>28.6%</td><td>24.4%</td><td>16.2%</td><td>1.6%</td></tr> <tr> <td>Asian</td><td>12.7%</td><td>7.0%</td><td>1.2%</td><td>-</td></tr> </tbody> </table>	Racialcomposition	2010	1990	1970	1940	White	44.0%	52.3%	76.6%	93.6%	—Non-Hispanic	33.3%	43.2%	62.9%	92.0%	Black or African American	25.5%	28.7%	21.1%	6.1%	Hispanic or Latino (of any race)	28.6%	24.4%	16.2%	1.6%	Asian	12.7%	7.0%	1.2%	-
Borough	Neighborhood	Latitude	Longitude																																																																																																
0 Bronx	Wakefield	40.894705	-73.847201																																																																																																
1 Bronx	Co-op City	40.874294	-73.829939																																																																																																
2 Bronx	Eastchester	40.887556	-73.827806																																																																																																
3 Bronx	Fieldston	40.895437	-73.905643																																																																																																
4 Bronx	Riverdale	40.890834	-73.912585																																																																																																
FacilityName	ServiceCategory	Service_Type	Address	Address2	Borough	ZipCode																																																																																													
Inwood Park Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	Isham St bet Seaman & Cooper		Nan Manhattan	10034																																																																																													
82nd Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	82nd St bet 1st & York Aves		Nan Manhattan	10028																																																																																													
125th Street Farmers Market	Farmers Markets and Food Boxes	Farmers Markets	125th St & Adam Clayton Powell Jr Blvd		Nan Manhattan	10027																																																																																													
170 Farm Stand	Farmers Markets and Food Boxes	Farmers Markets	170th St & Townsend Ave		Nan Bronx	10452																																																																																													
175th Street Greenmarket	Farmers Markets and Food Boxes	Farmers Markets	175th St bet Wadsworth Ave & Broadway		Nan Manhattan	10033																																																																																													
Racialcomposition	2010	1990	1970	1940																																																																																															
White	44.0%	52.3%	76.6%	93.6%																																																																																															
—Non-Hispanic	33.3%	43.2%	62.9%	92.0%																																																																																															
Black or African American	25.5%	28.7%	21.1%	6.1%																																																																																															
Hispanic or Latino (of any race)	28.6%	24.4%	16.2%	1.6%																																																																																															
Asian	12.7%	7.0%	1.2%	-																																																																																															

Data analysis: NYC geographical coordinates

- We load the data and transform it into a pandas dataframe. Each DF has the geographical has the coordinates of every NYC neighborhoods.
- We use Geopy as well as folium libraries to creat a map of NYC.
- Foursquare will be used to get venues analysis



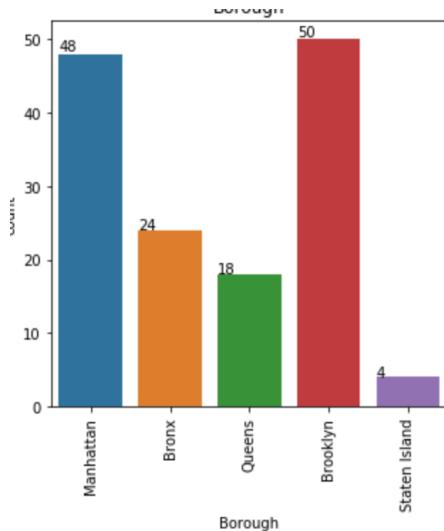
Data analysis: Farmers' markets

We load the data and transform it into a pandas dataframe. We can see how they are spread in NYC by looking at the map below.



We can create this bar graph using the data. It sheds light on the most popular neighborhoods for farmers:

- 1/ Brooklyn
- 2/ Manhattan
- 3/ Bronx
- 4/ Queens



Data analysis: Population & Demographics

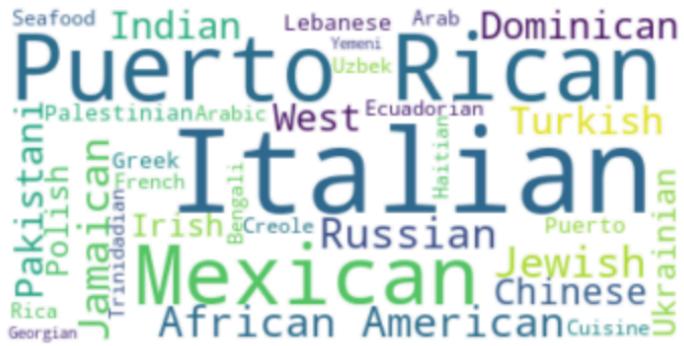
We use Beautiful soup to extract the data from Wikipedia pages.

	Borough	County	Estimate_2017	square_miles	square_km	persons_sq_mi	persons_sq_km
0	Manhattan	New York	1,664,727	22.83	59.13	72,033	27,826
1	The Bronx	Bronx	1,471,160	42.10	109.04	34,653	13,231
2	Brooklyn	Kings	2,648,771	70.82	183.42	37,137	14,649
3	Queens	Queens	2,358,582	108.53	281.09	21,460	8,354
4	Staten Island	Richmond	479,458	58.37	151.18	8,112	3,132
5	City of New York		8,622,698	302.64	783.83	28,188	10,947
6	State of New York		19,849,399	47,214	122,284	416.4	159
7	Sources: [2] and see individual borough articles	NaN	NaN	NaN	NaN	NaN	NaN

- What we see is that Manhattan is the smallest & most populated neighborhood
- Brooklyn is the city's most populous borough
- The Queens is the largest borough

Data analysis: Cuisine

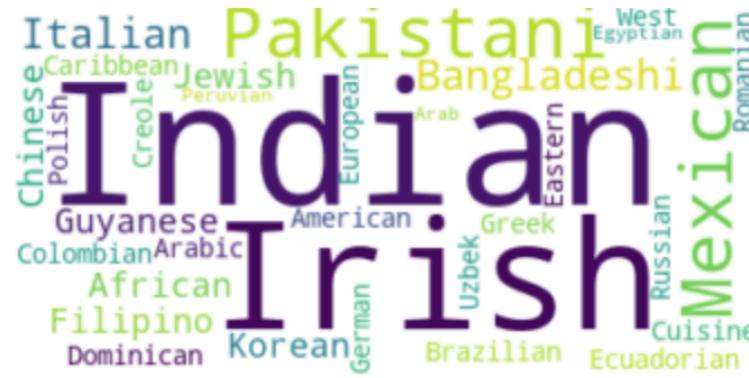
We use Word Cloud to generate most preferred cuisine by neighborhood. As a whole, the most preferred food in NYC is Italian, Puerto Rican, Mexican, Jewish.



Brooklyn



Bronx



Queens



Manhattan

Data analysis: Foursquare – Brooklyn & Manhattan

We use Foursquare to analyze different venues in NYC. We look at the top 200 venues in a circle of 100 meters.

	Neighborhood	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude	VenueCategory
0	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
1	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
2	Marble Hill	40.876551	-73.91066	Tibbett Diner	40.880404	-73.908937	Diner
3	Marble Hill	40.876551	-73.91066	Sam's Pizza	40.879435	-73.905859	Pizza Place
4	Marble Hill	40.876551	-73.91066	Loeser's Delicatessen	40.879242	-73.905471	Sandwich Place

Brooklyn & Manhattan venue data

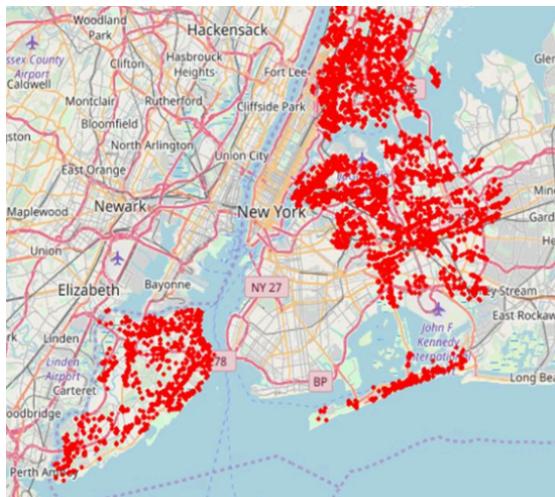


Brooklyn & Manhattan Venues Map

Data analysis: Foursquare – Bronx & Queens

	Neighborhood	NeighborhoodLatitude	NeighborhoodLongitude	Venue	VenueLatitude	VenueLongitude	VenueCategory
0	Wakefield	40.894705	-73.847201	Lollipops Gelato	40.894123	-73.845892	Dessert Shop
1	Wakefield	40.894705	-73.847201	Ripe Kitchen & Bar	40.898152	-73.838875	Caribbean Restaurant
2	Wakefield	40.894705	-73.847201	Jackie's West Indian Bakery	40.889283	-73.843310	Caribbean Restaurant
3	Wakefield	40.894705	-73.847201	Ali's Roti Shop	40.894036	-73.856935	Caribbean Restaurant
4	Wakefield	40.894705	-73.847201	Rite Aid	40.896521	-73.844680	Pharmacy

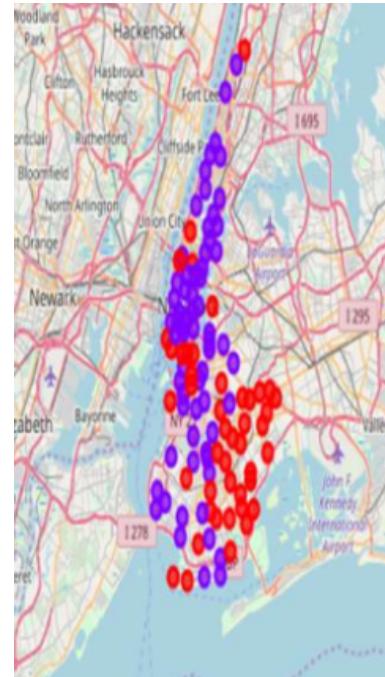
Bronx & Queens venue data



Bronx & Queens Venues Map

Results – Brooklyn and Manhattan

- We segment and cluster the neighborhoods
- In Red, it is where the clusters has the smallest value, meaning there are not that many competitions
- On the other hand, in Pink it is where there is most competition
- Brooklyn and Manhattan are thus saturated.



Results – Bronx, Queens, Staten Island

- We can see clearly that these markets are not saturated
- In Red, it is where the clusters has the smallest value, meaning there are not that many competitions
- There are unstapped markets



Conclusion

- ABC Company can take many risks regarding cuisine: in Manhattan and Brooklyn, menus are widely multicultural (mostly Italian and Mexican though). Maybe avoiding opening another Italian restaurant is a good idea, as this market seems saturated
- Manhattan and Brooklyn are saturated, so ABC should consider one of the three other Boroughs.
- In Queens, Bronx and Staten Island, there are not many Farmers markets. That can also be an opportunity for ABC Company, who could open a few to expand their business.
- Consequently, I would choose Staten Island. Then, Bloomfield as it is not saturated (yet) and ABC could have the first mover advantage in this neighborhood.