Capstone Report - The Battle of the Neighborhoods (Week 2)

Applied Data Science Capstone by IBM/Coursera

Problem Background:

In this module we will evaluate the competitive market and opportunity cost associated with doing business in New York City, NY. Since the establishment of the US, New York City has been the leader in driving revenue for the nation in every facet. From being the financial capital of the US coupled with its attractiveness to international business New York City has attracted many diverse cultures, heritages, and ethnicities. With that comes the ability to create a niche business or compete in the open market while minimizing downside risk. The results from this module will enhance insight while translating the data in efforts to discover a strategic approach in local direct marketing.

Problem Description

With the emergence of the food culture and growth from self-proclaimed foodies New York City has become one of the primary cuisine hubs of the world. There are no favorites which allows for ample opportunities for a restaurant investor who may be new to the area.

1. Chinese, Japanese, Korean cuisines
2. Italian Cuisine
3. Brazilian Cuisine
4. Cajun Cuisine
5. African, Jamaican, Caribbean
6. Greek Cuisine
7. Indian Cuisine
8. Jewish Cuisine
9. Mexican Cuisine
10. Thai Cuisine
11. Mediterranean Cuisine
12. American Cuisine
13. French Cuisine

With all the cuisine choices you can understand exactly how competitive and overwhelming a simple food choice can be. Add in food trucks, bodegas, and fusion restaurants just to name a few niches. Somethings to consider before opening a new restaurant location in New York City are:

1. Current population and tourism in New York City.
2. Diversity of demographics, heritages, ethnicities of New York City.
3. Opportunity cost to provide organic and vegan products from local farmers markets.
4. Distance from entertainment and multipurpose areas and food selection.
5. Statistics on Untapped and Saturated areas
6. Top competitors in those markets
7. Cuisine Options
8. Segmentation of the Boroughs

This research was designed based on the company's goal to obtain multiple locations over the next five years. Along with franchising the importance of current market data will strategically expedite revenue and return on investment.

Target Audience

I was brought on to this project to lead the team of data scientist due to my vast knowledge of the area and industry. My team and I will discover opportunities and make recommendations for future locations across New York City. We understand how vital this initial location is to the growth of the overall portfolio and pride ourselves on following through for years to come.

Success Criteria

The success of this project will be based off of the immediate ability to generate profits based on the marketing efforts from research. If this initial location can maintain profitability for two years Lipsey Enterprise will invest in another location in emerging markets.

Data Collected

Primary location: New York City

The following data will be utilized to evaluate New York City as the primary market for potential restaurant locations.

Data 1:

The dataset that we will be utilizing to provide a proper assessment can be reviewed here: https://geo.nyu.edu/catalog/nyu_2451_34572

	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

	Borough	Neighborhood	Latitude	Longitude
0	Brooklyn	Bay Ridge	40.625801	-74.030621
1	Brooklyn	Bensonhurst	40.611009	-73.995180
2	Brooklyn	Sunset Park	40.645103	-74.010316
3	Brooklyn	Greenpoint	40.730201	-73.954241
4	Brooklyn	Gravesend	40.595260	-73.973471

	Borough	Neighborhood	Latitude	Longitude
0	Manhattan	Marble Hill	40.876551	-73.910660
1	Manhattan	Chinatown	40.715618	-73.994279
2	Manhattan	Washington Heights	40.851903	-73.936900
3	Manhattan	Inwood	40.867684	-73.921210
4	Manhattan	Hamilton Heights	40.823604	-73.949688

	Borough	Neighborhood	Latitude	Longitude
0	Queens	Astoria	40.768509	-73.915654
1	Queens	Woodside	40.746349	-73.901842
2	Queens	Jackson Heights	40.751981	-73.882821
3	Queens	Elmhurst	40.744049	-73.881656
4	Queens	Howard Beach	40.654225	-73.838138

The data is segmented into a total of 5 boroughs consisting of 306 neighborhoods that we will be exploring based on longitude and latitude of each neighboring community.

Data 2:

The 2nd dataset will provide us with data of local eateries in New York City consisting of mobile food trucks, food carts, snack bars and restaurants.

https://data.cityofnewyork.us/Recreation/Directory-of-Eateries/8792-ebcp

This dataset also includes a list of urban agricultural sites that can be utilize for city gardens and urban farms.
https://data.cityofnewyork.us/Environment/City-owned-sites-that-are-available-and-potentiall/qchy-end3

Having access to organic and vegan products in a major city like New York is vital to operating a restaurant.

Data 3:

Wikipedia is our main resource for our 3rd dataset.

1. Population of New York City.
2. Demographic of New York City.
3. List of Cuisines of New York City.
   Links to Wikipedia sources:
   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

Data 4:

Foursquare API will provide the content needed in order to discover venues for each New York City neighborhood in our initial dataset. (5 Borough and 306 Neighborhoods)

Methodology

In this project we will direct our efforts on detecting areas of New York City that have low restaurant density. We will limit our analysis to area ~6km around city center.

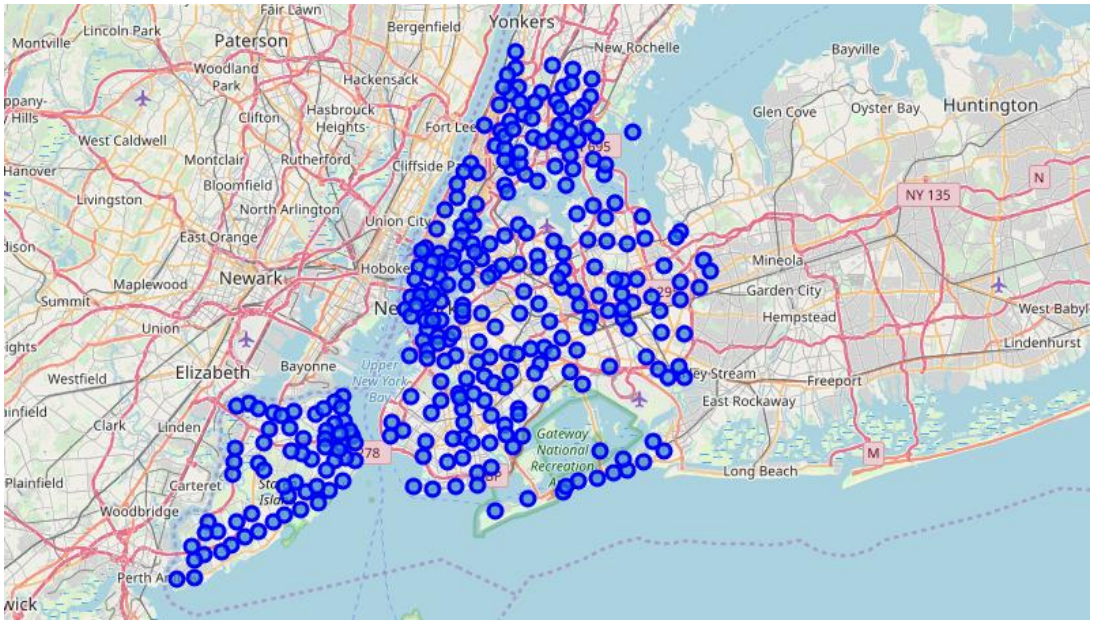
In first step we have collected the required data: location and type (category) of every restaurant within 6km from New York City center. We have also identified African restaurants (according to Foursquare categorization).

Analytic Approach:

According to the feedback from our sources New York City is comprised of 5 main boroughs which consist of 306 neighborhoods. The main areas we targeted based on demographic and popularity are Manhattan, Queens, Brooklyn and the Bronx.

Data 1: Geographic Coordinates:

- Our initial data was pulled from the file newyork_data.json
- We then transition the data into pandas dataframe
- Next, we pinpoint our coordinates for 306 neighborhoods in New York City
- Our Foursquare API provided us with the appropriate data for venues
- We imported Geopy and Folium to create our visualizations for New York City
- The neighborhoods are indicated by blue marker.



Data 2: Venues and Eateries: The 2nd dataset will provide us with data of local eateries in New York City consisting of mobile food trucks, food carts, snack bars and restaurants. https://data.cityofnewyork.us/Recreation/Directory-of-Eateries/8792-ebcp

This dataset also includes a list of urban agricultural sites that can be utilize for city gardens and urban farms. https://data.cityofnewyork.us/Environment/City-owned-sites-that-are-available-and-potentiall/qchy-end3 Having access to organic and vegan products in a major city like New York is vital to operating a restaurant.

Data 3: Wikipedia is our main resource for our 3rd dataset. We scraped these Wikipedia pages in order to acquire our data. Beautiful Soup was the tool that we imported into python. This allowed us to extract data and convert html into a useful format.

Population of New York City. Demographic of New York City. List of Cuisines of New York City. Links to Wikipedia
sources: 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

Results: Manhattan has a population of 72,033 persons per square mile. (Updated:2015) Making Manhattan the most populated county in the US. Central Harlem has the population and several existing African restaurants.

Demographics: New York City has an estimated population of 8,622,698 (Updated:2017)

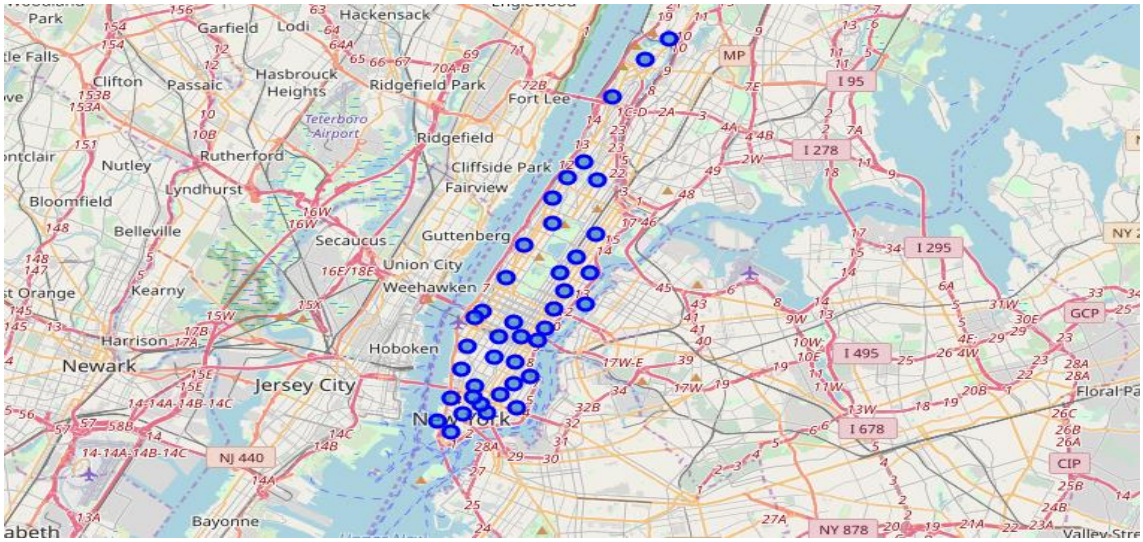
New York City Cuisines list was comprised using Beautiful Soup
below: https://en.wikipedia.org/wiki/Cuisine_of_New_York_City

New York City Cuisine:

- Top Rated: Italian
- Puerto Rican
- Mexican
- Jewish
- African

Manhattan Cuisine:

- Italian
- American
- Puerto Rican
- Indian



Queens Cuisine:

- Indian
- Irish
- Mexican
- Pakistan

Brooklyn Cuisine:

- Italian
- Puerto Rican
- Mexican

Bronx Cuisine:

- Italian
- Puerto Rican
- Albanian
- Dominican

Data 4: Geographic Coordinates Foursquare API provided the data used to leverage the provisions of the venues listed within each neighborhood. Using the parameters to find the top 100 venues located within a 500KM radius.

Conclusion

After evaluating our results, we have concluded that Central Harlem would be the ideal spot to start the first Jamaican Fusion restaurant location. Based on the population and proximity we believe that there is enough traffic to generate sufficient business from marketing strategies. The data collected revealed that the second most sought out venue in Central Harlem was African Cuisine. There is no better market to begin investing in efforts to gain parts of the existing market share. Once the brand becomes established there will be opportunities to branch out due to the success of the first location.

	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	Battery Park City	Park	Coffee Shop	Hotel	Memorial Site	Gym	Boat or Ferry	Wine Shop	Pizza Place	BBQ Joint	Clothing Store
1	Carnegie Hill	Pizza Place	Coffee Shop	Café	Bakery	Gym / Fitness Center	Gym	Grocery Store	Japanese Restaurant	French Restaurant	Cosmetics Shop
2	Central Harlem	Cosmetics Shop	African Restaurant	Bar	Chinese Restaurant	Seafood Restaurant	French Restaurant	Fried Chicken Joint	American Restaurant	Dessert Shop	Cocktail Bar
3	Chelsea	Coffee Shop	Bakery	Ice Cream Shop	Nightclub	Italian Restaurant	Seafood Restaurant	Theater	American Restaurant	Hotel	Japanese Restaurant
4	Chinatown	Chinese Restaurant	Cocktail Bar	Bubble Tea Shop	American Restaurant	Spa	Salon / Barbershop	Bakery	Vietnamese Restaurant	Optical Shop	Asian Restaurant
5	Civic Center	Gym / Fitness Center	Italian Restaurant	Hotel	Coffee Shop	French Restaurant	Yoga Studio	Sporting Goods Shop	Sandwich Place	Cocktail Bar	Park
6	Clinton	Theater	Gym / Fitness Center	Hotel	American Restaurant	Italian Restaurant	Wine Shop	Coffee Shop	Sandwich Place	Spa	Gym