

Selecting the Best Neighborhood to Open a Smoothie Shop in New York City

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Introduction:

For this project, we will explore where the best neighborhood in New York City would be to open a Smoothie Shop. Whether they are tourists or locals, people in New York City are always on the move. New York City has a diverse selection of food options: sit down restaurants, fast food places, food carts, ice cream shops, etc. Each food option in New York City varies in terms of quick meal options, healthy options, and the atmosphere of the surrounding area. A Smoothie Shop could provide a quick and healthy option for people looking for a quick meal on the go. From fruity to protein rich to super sweet, a smoothie can come in many different tasty varieties that cater to different wishes of the consumer.

Business Problem:

Selecting the best neighborhood in New York City to open a Smoothie Shop requires many considerations. We want to select an area with an increased amount of traffic to increase the possible number of customers. We also want to be in an area that reflects a want/need for a quick, healthy option. Once we determine which cluster of neighborhoods have the desired atmosphere, the main things to consider are:

1. **Traffic** – We want to select an area with a large number of people, so we want both locals and tourists. This means that we may want to avoid residential areas and look for tourist spots that attract both locals and tourists.
2. **Healthy Options** – We want to find an area that has healthy restaurants and/or places like gyms and fitness centers. This could lead to there being more competition, but it also indicates that there is a demand for a healthy option. A Smoothie Shop differentiates itself from other healthy restaurants by providing a quick, on the go option.
3. **Alternative Options** – We want to also provide an alternative option to other on the go drinks, snacks, and desserts. This means that we also want to look at neighborhoods with coffee shops, snack bars, or ice cream shops.

Target Audience:

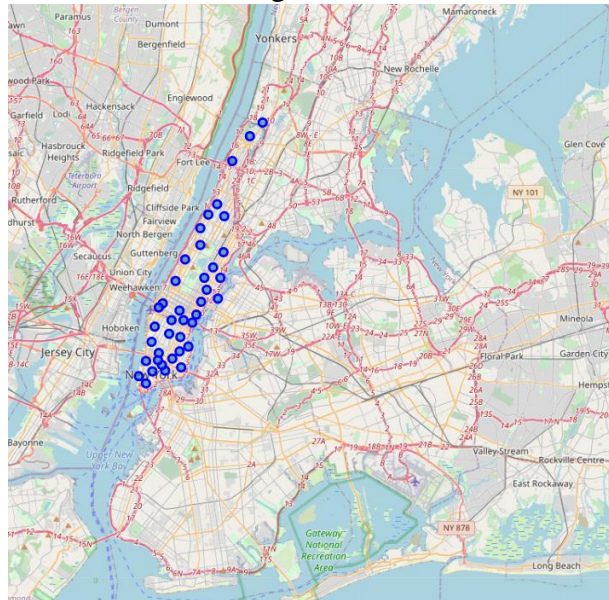
Our target audience are business owners and entrepreneurs who would be interested in opening a Smoothie Shop in New York City. We also want to target potential investors and developers that could aid in starting up a new business in New York City. Another possible audience would be any potential suppliers that would be interested in providing the necessary products for the Smoothie Shop.

Data Description:

In order to select the best Neighborhood to open a Smoothie Shop in New York City, we will use data from the Foursquare API. The Foursquare API location data allows us to access a desired location and surrounding restaurants, facilities, and other points of interest. We will use this data to determine which areas in New York City meet the criteria for being a good place to open a Smoothie Shop. A neighborhood with high traffic, healthy restaurants, and alternative options would be a good candidate for opening a Smoothie Shop.

Methodology:

1. Download data for New York City and create data frame that includes the Borough, Neighborhood, Latitude, and Longitude. Then, use this data to create a map with each of the neighborhoods marked by utilizing the Folium library. Since New York City is so extensive, for simplicity, we will limit the data to the Borough of Manhattan.

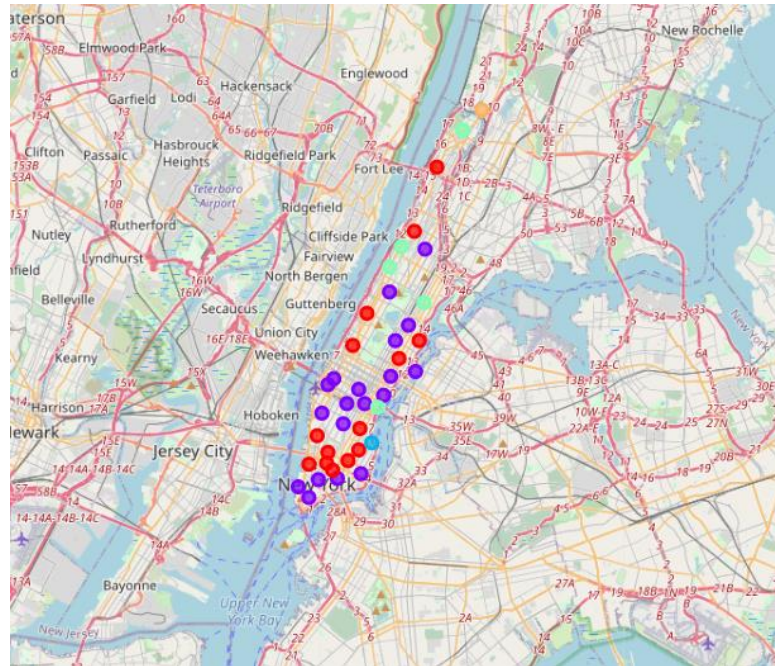
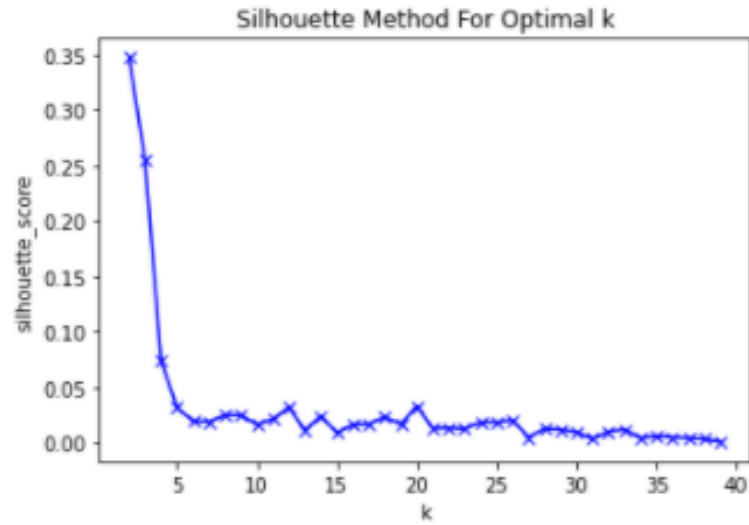


2. Use the Foursquare information to determine which venues are in each of the neighborhoods in Manhattan. Then order the venues in each neighborhood by most common to least common, and put that information into a dataset.

[28]:

	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	Hotel	Gym	Coffee Shop	Memorial Site	Shopping Mall	Plaza	Burger Joint	Gourmet Shop	Playground
1	Carnegie Hill	Coffee Shop	Café	Bookstore	Italian Restaurant	Gym / Fitness Center	Gym	French Restaurant	Yoga Studio	Wine Shop	Vietnamese Restaurant
2	Central Harlem	African Restaurant	Bar	French Restaurant	American Restaurant	Chinese Restaurant	Seafood Restaurant	Cosmetics Shop	Cafeteria	Grocery Store	Library
3	Chelsea	Coffee Shop	Art Gallery	Bakery	American Restaurant	Ice Cream Shop	Italian Restaurant	Japanese Restaurant	Park	Cycle Studio	Cupcake Shop
4	Chinatown	Chinese Restaurant	Dessert Shop	Cocktail Bar	Bakery	American Restaurant	Hotpot Restaurant	Spa	Optical Shop	Noodle House	Salon / Barbershop

3. Due to the large number of venues (3219) and neighborhoods (323), we want to utilize k-means determine how many clusters to use when grouping the neighborhoods based on their top 10 venues. This will allow us to narrow down the number of neighborhoods for us to choose the best option from. Utilizing k-means yielded that the optimal number of clusters to be 5.



- Analyze each cluster and determine which cluster would be best to work with.

Cluster 1:

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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
2	Manhattan	Washington Heights	40.851903	-73.936900	0	Café	Bakery	Grocery Store	Latin American Restaurant	Deli / Bodega	New American Restaurant	Donut Shop
4	Manhattan	Hamilton Heights	40.823604	-73.949688	0	Pizza Place	Coffee Shop	Café	Mexican Restaurant	Cocktail Bar	Indian Restaurant	Liquor Store
9	Manhattan	Yorkville	40.775930	-73.947118	0	Italian Restaurant	Coffee Shop	Gym	Bar	Deli / Bodega	Sushi Restaurant	Japanese Restaurant
10	Manhattan	Lenox Hill	40.768113	-73.956860	0	Italian Restaurant	Sushi Restaurant	Coffee Shop	Pizza Place	Cocktail Bar	Burger Joint	Gym / Fitness Center
12	Manhattan	Upper West Side	40.787658	-73.977059	0	Italian Restaurant	Café	Bar	Indian Restaurant	Wine Bar	Pizza Place	Bakery

(Only displays first 5 neighborhoods in cluster)

```

Manhattan    14
Name: Borough, dtype: int64
-----
Italian Restaurant    6
Bar                    2
Café                  1
Plaza                  1
American Restaurant   1
Pizza Place           1
Bakery                 1
Clothing Store         1
Name: 1st Most Common Venue, dtype: int64
-----
Café                   3
Italian Restaurant     2
Coffee Shop            2
Mexican Restaurant     2
Sushi Restaurant       2
Bakery                 1
American Restaurant    1
Park                   1
Name: 2nd Most Common Venue, dtype: int64
-----

```

Cluster 1's most common and second most common venues mainly consist of different types of restaurants and other residential places (cafés, a bakery, a park, a clothing store, etc.). This indicates that Cluster 1 can be classified as a more residential area, and probably not what we are looking for.

Cluster 2:

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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
1	Manhattan	Chinatown	40.715618	-73.994279	1	Chinese Restaurant	Dessert Shop	Cocktail Bar	Bakery	American Restaurant	Hotpot Restaurant	Spa
6	Manhattan	Central Harlem	40.815976	-73.943211	1	African Restaurant	Bar	French Restaurant	American Restaurant	Chinese Restaurant	Seafood Restaurant	Cosmetics Shop
8	Manhattan	Upper East Side	40.775639	-73.960508	1	Exhibit	Italian Restaurant	Coffee Shop	Bakery	Gym / Fitness Center	Yoga Studio	Cosmetics Shop
11	Manhattan	Roosevelt Island	40.762160	-73.949168	1	Playground	Deli / Bodega	School	Greek Restaurant	Supermarket	Bubble Tea Shop	Pizza Place
14	Manhattan	Clinton	40.759101	-73.996119	1	Theater	American Restaurant	Gym	Gym / Fitness Center	Coffee Shop	Cocktail Bar	Sandwich Place

(Only displays first 5 neighborhoods in cluster)

```

Manhattan    19
Name: Borough, dtype: int64
-----
Coffee Shop            6
Chinese Restaurant     2
Italian Restaurant     2
Korean Restaurant     1
Bar                    1
African Restaurant     1
Exhibit                1
Playground             1
Theater                1
Hotel                  1
Japanese Restaurant    1
Park                   1
Name: 1st Most Common Venue, dtype: int64
-----
Italian Restaurant     3
Hotel                  3
Japanese Restaurant    2
Coffee Shop            2
Café                   1
American Restaurant    1
Dessert Shop           1
Gym / Fitness Center   1
Art Gallery            1
Spa                    1
Bar                    1
Pizza Place            1
Deli / Bodega          1
Name: 2nd Most Common Venue, dtype: int64
-----

```

Cluster 2 has many most common and second most common venues that fit what we are looking for. There are high traffic indicators such as hotels and theaters. There are also healthy options such as gyms and fitness centers. In addition to those venues, there are

alternative options such as coffee shops and cafés. Cluster 2 could be a good option to open a Smoothie Shop in.

Cluster 3:

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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
37	Manhattan	Stuyvesant Town	40.731	-73.974052	2	Park	Pet Service	Gym / Fitness Center	Harbor / Marina	Coffee Shop	Baseball Field	Bar

```
Manhattan    1
Name: Borough, dtype: int64
-----
Park         1
Name: 1st Most Common Venue, dtype: int64
-----
Pet Service   1
Name: 2nd Most Common Venue, dtype: int64
-----
```

Cluster 3 is not very large (there is only one neighborhood), and its top venues indicate that it may be a residential area. Based on what we are looking for, Cluster 3 would not be the best choice for opening a Smoothie Shop.

Cluster 4:

Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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	
3	Manhattan	Inwood	40.867684	-73.921210	3	Mexican Restaurant	Lounge	Restaurant	Café	Frozen Yogurt Shop	Deli / Bodega	Pizza Place
5	Manhattan	Manhattanville	40.816934	-73.957385	3	Seafood Restaurant	Coffee Shop	Bar	Deli / Bodega	Italian Restaurant	Park	Mexican Restaurant
7	Manhattan	East Harlem	40.792249	-73.944182	3	Mexican Restaurant	Bakery	Thai Restaurant	Deli / Bodega	Latin American Restaurant	Sandwich Place	French Restaurant
26	Manhattan	Morningside Heights	40.808000	-73.963896	3	Park	American Restaurant	Coffee Shop	Bookstore	Burger Joint	Café	Deli / Bodega
36	Manhattan	Tudor City	40.746917	-73.971219	3	Café	Park	Mexican Restaurant	Asian Restaurant	Diner	Deli / Bodega	Coffee Shop

(Only displays first 5 neighborhoods in cluster)

```
Manhattan    5
Name: Borough, dtype: int64
-----
Mexican Restaurant    2
Café                  1
Seafood Restaurant    1
Park                  1
Name: 1st Most Common Venue, dtype: int64
-----
Coffee Shop          1
Bakery               1
American Restaurant  1
Lounge               1
Park                 1
Name: 2nd Most Common Venue, dtype: int64
-----
```

Similarly to Cluster 1, Cluster 4 appears to be more of a residential area and is probably not the best option.

Cluster 5:

Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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	
0	Manhattan	Marble Hill	40.876551	-73.91086	4	Gym	Discount Store	Coffee Shop	Sandwich Place	Yoga Studio	Pizza Place	Deli / Bodega

```
Manhattan    1
Name: Borough, dtype: int64
-----
Gym          1
Name: 1st Most Common Venue, dtype: int64
-----
Discount Store    1
Name: 2nd Most Common Venue, dtype: int64
-----
```

Similarly to Cluster 3, Cluster 5 is not very extensive (there is only one neighborhood) and appears to be more residential. Therefore, Cluster 5 is also probably not the best choice.

----Clinton----			----Midtown----			----Financial District----		
	venue	freq		venue	freq		venue	freq
0	Theater	0.07	0	Hotel	0.06	0	Coffee Shop	0.10
1	Gym	0.05	1	Coffee Shop	0.06	1	Pizza Place	0.05
2	American Restaurant	0.05	2	Clothing Store	0.05	2	Cocktail Bar	0.04
3	Gym / Fitness Center	0.05	3	Bakery	0.05	3	American Restaurant	0.04
4	Coffee Shop	0.04	4	Theater	0.04	4	Park	0.03

----Murray Hill----			----Midtown South----			----Chelsea----		
	venue	freq		venue	freq		venue	freq
0	Japanese Restaurant	0.04	0	Korean Restaurant	0.18	0	Coffee Shop	0.09
1	Sandwich Place	0.04	1	Hotel	0.06	1	Art Gallery	0.05
2	Coffee Shop	0.04	2	Japanese Restaurant	0.04	2	Bakery	0.04
3	American Restaurant	0.04	3	Cosmetics Shop	0.04	3	American Restaurant	0.04
4	Hotel	0.04	4	Bakery	0.03	4	Ice Cream Shop	0.03

If we compare each of the neighborhood's top 5 venues to our desired criteria, four out of Clinton's top five venues meet the criteria for high traffic indicators, healthy options, or alternative options. That is the most out of all the top candidates. Clinton is in a high traffic area that has gyms and fitness centers that create a demand for a healthy drink option and an alternative option to other drinks like coffee. Based on our analysis of the results, Clinton would be the best neighborhood to open a Smoothie Shop.

Discussion:

For the purposes of this analysis, these results are satisfactory. It is important to note however, that there could be other key considerations to make, such as rent prices, suppliers, and demographics of the area. Increasing the number of clusters used to analyze the neighborhoods could also affect the results. It is also important to note that in this analysis we narrowed our search to the Borough of Manhattan. New York City is a very large and diverse city. Expanding our search to include other Boroughs, or limiting our search to other specific Boroughs, could lead to different results.

Conclusion:

There are many considerations to make when selecting the best place to open a Smoothie Shop in a city as big and diverse as New York City. It is important to determine which factors and attributes of a given city or neighborhood could have an impact on the business. Utilizing this type of data analysis can be informative and consequential for the business owner and other interested parties such as investors, developers, and suppliers. Overall, knowing the criteria for the business and the atmosphere of the surrounding area can be crucial to the success of the business.