CAPSTONE PROJECT - THE BATTLE OF NEIGHBORHOODS

Best location to open an Indian Restaurant in Manhattan, New York

INTRODUCTION/BUSINESS PROBLEM

Business Problem

- The City of New York is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history.

- Indian restaurants have become so popular in the United States now it seems that there is one on every corner, not only in major cities but also in smaller cities. Starting a Indian restaurant can be a great business opportunity, but you need to distinguish yourself from others to enjoy long-term success.

BUSİNESS PROBLEM

- My client wants to open his business in Manhattan area, so I focus on that borough during my analysis.

- If you plan a real restaurant that can demand higher prices for Indian Restaurants, focus on neighbourhoods and outlets that already attract a sophisticated Indian client. If you plan a cheap buffet restaurant, points to the masses looking for affordable high-traffic locations with large shopping centres and other local points of interest.

- So it is evident that to survive in such competitive market it is very important to strategically plan. Various factors need to be studied in order to decide on the Location.

DATA SELECTION

- To identify the characteristics of our competitors' venues in Manhattan, we would first need to find out the number of Indian Restaurants in Manhattan currently and their location.

- We then used Google Map API to find their geographic coordinates based on their postal code addresses.

- In Manhattan, there is 1090 Indian Restaurants are currently operating.

```
newyork_venues_Indian.shape
Out[23]: (1090, 7)
```

DATA SELECTION

- Next, we also used Google Map API to find their geographic coordinates of the 5 locations shortlisted for our Indian bar:
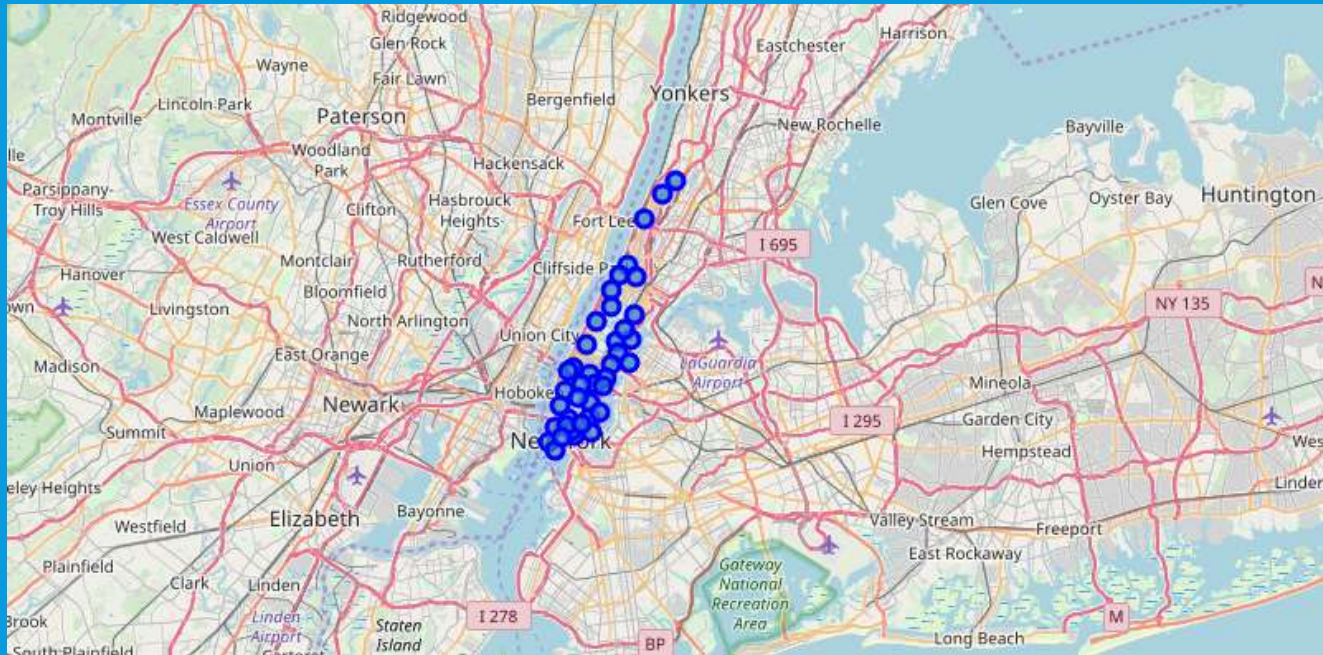
Out[24]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.910660	Riverdale Indian Cuisine	40.880886	-73.908800	Indian Restaurant
1	Marble Hill	40.876551	-73.910660	Tazmohol Indian Restaurant	40.879331	-73.903192	Indian Restaurant
2	Marble Hill	40.876551	-73.910660	Cumin Indian Cuisine	40.886459	-73.909816	Indian Restaurant
3	Chinatown	40.715618	-73.994279	Kabab Bites	40.720094	-73.995819	Indian Restaurant
4	Chinatown	40.715618	-73.994279	Hampton Chutney Co.	40.720220	-73.999347	Dosa Place

Table 2: Data frame containing geographic coordinates of our 5 shortlisted locations

METHODOLOGY

- Addresses are converted into their equivalent latitude and longitude values.

- Foursquare API is used to explore neighborhoods in Manhattan, New York.

- After that, explore function to get Indian restaurant categories in each neighborhood.

METHODOLOGY

METHODOLOGY

Indian Restaurants in Manhattan

METHODOLOGY

· Then using this feature to group the neighborhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighborhoods in Manhattan and its emerging clusters.

Out[36]:

	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	Indian Restaurant	Food Truck	Asian Restaurant	Tapas Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Vegetarian / Vegan Restaurant
1	Carnegie Hill	Indian Restaurant	North Indian Restaurant	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
2	Central Harlem	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
3	Chelsea	Indian Restaurant	Food Truck	Vegetarian / Vegan Restaurant	Indian Chinese Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
4	Chinatown	Indian Restaurant	North Indian Restaurant	Deli / Bodega	Dosa Place	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Diner	Hookah Bar

RESULTS

```
In [37]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 0, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape
```

Out[37]:

	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
1	Chinatown	Indian Restaurant	North Indian Restaurant	Deli / Bodega	Dosa Place	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Diner	Hookah Bar
16	Murray Hill	Indian Restaurant	South Indian Restaurant	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	North Indian Restaurant	Diner	Chaat Place	Deli / Bodega	Dosa Place
19	East Village	Indian Restaurant	Deli / Bodega	Dosa Place	Vegetarian / Vegan Restaurant	Chaat Place	North Indian Restaurant	Food Truck	Burrito Place	Diner	Hookah Bar
22	Little Italy	Indian Restaurant	Dosa Place	Asian Restaurant	North Indian Restaurant	Deli / Bodega	Food Truck	Burrito Place	Chaat Place	Diner	Vegetarian / Vegan Restaurant
23	Soho	Indian Restaurant	Food Truck	Dosa Place	Asian Restaurant	North Indian Restaurant	Deli / Bodega	Burrito Place	Chaat Place	Diner	Vegetarian / Vegan Restaurant
27	Gramercy	Indian Restaurant	Vegetarian / Vegan Restaurant	South Indian Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Hookah Bar	North Indian Restaurant	Tapas Restaurant
31	Noho	Indian Restaurant	Dosa Place	Vegetarian / Vegan Restaurant	Food Truck	Chaat Place	North Indian Restaurant	Deli / Bodega	Burrito Place	Diner	Hookah Bar

RESULT

Cluster 1


```
In [38]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 1, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape
```

Out[38]:

	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	Marble Hill	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
2	Washington Heights	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
4	Hamilton Heights	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
5	Manhattanville	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
6	Central Harlem	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar
7	East Harlem	Indian Restaurant	Vegetarian / Vegan Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Hookah Bar

RESULT

```
In [39]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 2, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape
```

Out[39]:

	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
14	Clinton	Indian Restaurant	Food Truck	South Indian Restaurant	Diner	Vegetarian / Vegan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Dosa Place	Hookah Bar
15	Midtown	Indian Restaurant	Food Truck	South Indian Restaurant	Pakistani Restaurant	North Indian Restaurant	Diner	Vegetarian / Vegan Restaurant	Dosa Place	Burrito Place	Chaat Place
17	Chelsea	Indian Restaurant	Food Truck	Vegetarian / Vegan Restaurant	Indian Chinese Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
28	Battery Park City	Indian Restaurant	Food Truck	Asian Restaurant	Tapas Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Vegetarian / Vegan Restaurant
29	Financial District	Indian Restaurant	Food Truck	Asian Restaurant	Tapas Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Vegetarian / Vegan Restaurant
32	Civic Center	Indian Restaurant	Food Truck	Asian Restaurant	Dosa Place	Tapas Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Vegetarian / Vegan Restaurant
39	Hudson Yards	Indian Restaurant	Food Truck	South Indian Restaurant	Diner	Vegetarian / Vegan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Dosa Place	Hookah Bar

RESULT

Cluster 3


```
In [40]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 3, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape
```

Out[40]:

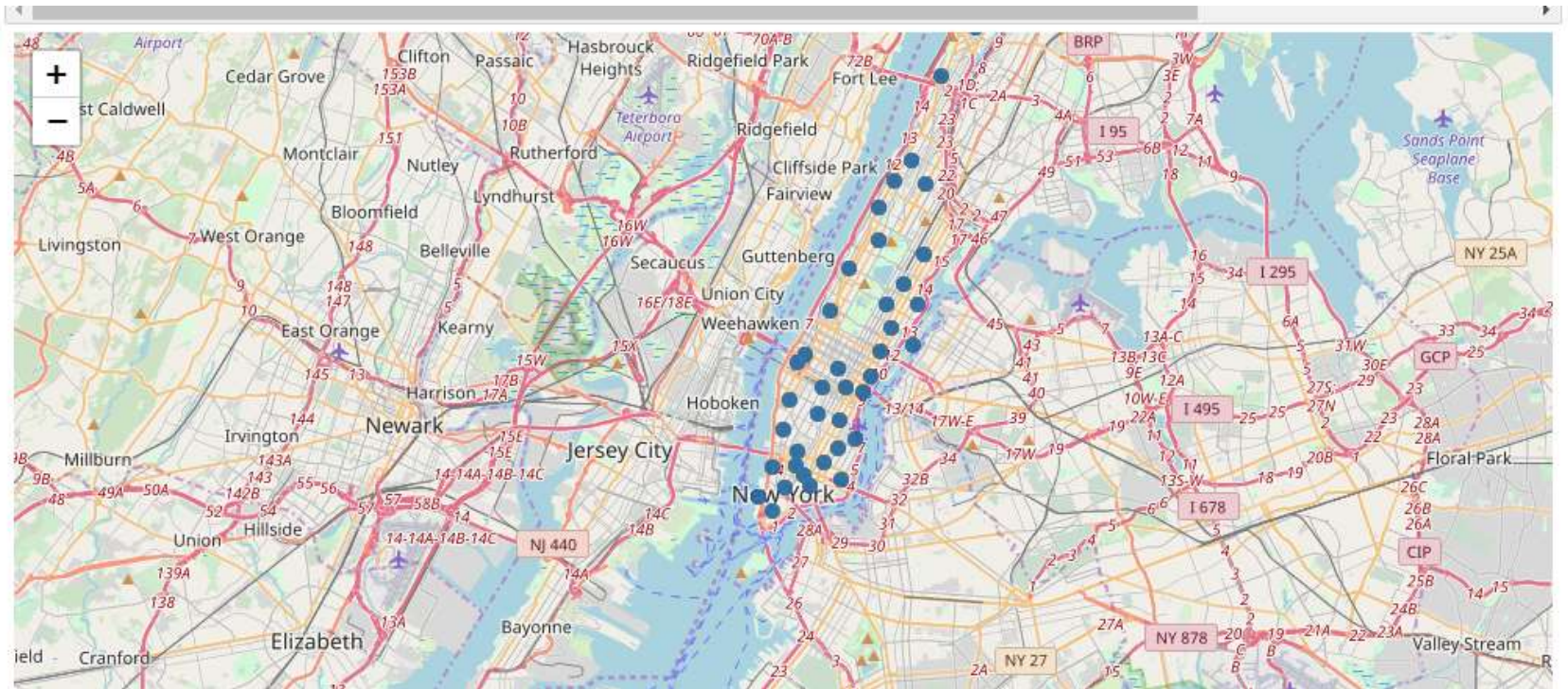|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
37	Stuyvesant Town	Indian Restaurant	Vegetarian / Vegan Restaurant	Chaat Place	North Indian Restaurant	Deli / Bodega	Dosa Place	Food Truck	Burrito Place	Diner	Hookah Bar

RESULT

Cluster 4

```
In [41]: manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 4, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape
```

Out[41]:

	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
8	Upper East Side	Indian Restaurant	North Indian Restaurant	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
9	Yorkville	Indian Restaurant	North Indian Restaurant	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
10	Lenox Hill	Indian Restaurant	Asian Restaurant	North Indian Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Vegetarian / Vegan Restaurant
11	Roosevelt Island	Indian Restaurant	Asian Restaurant	Himalayan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Food Truck	Vegetarian / Vegan Restaurant
12	Upper West Side	Indian Restaurant	South Indian Restaurant	Vegetarian / Vegan Restaurant	Food Truck	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
13	Lincoln Square	Indian Restaurant	Food Truck	South Indian Restaurant	Vegetarian / Vegan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Dosa Place	Hookah Bar
18	Greenwich Village	Indian Restaurant	Dosa Place	Food Truck	North Indian Restaurant	Vegetarian / Vegan Restaurant	Burrito Place	Chaat Place	Deli / Bodega	Diner	Hookah Bar

RESULT

DISCUSSION

- There is high competition in Midtown and Soho so it is very risky to open business in these areas.

- **Central Harlem has potential which is close to Morningside Heights area.**

- It can be done more detailed analysis by adding other factors such as transportation, demographics of inhabitants.

CONCLUSION

- Although all of the goals of this project were met there is definitely room for further improvement and development as noted below. However, the goals of the project were met and, with some more work, could easily be used as supporting document to open a new India Restaurant