Identifying best neighborhoods in NYC for opening Italian restaurant

Identifying best neighborhoods using location data

- We will first look at the number of existing Italian restaurants in each Boroughs and narrow down on the Borough with greatest potential. To achieve this, we will calculate density of Italian restaurant per population of 100,000 and choose the Borough with least density.

- Using heatmap, we can identify concentration of Italian restaurants in the Borough of greatest potential.

- Finally, we will Cluster the neighborhoods based on number of existing Italian restaurants. Also, we will identify the center location of the neighborhoods without any Italian restaurants and suggest to our customer for opening one in and around that location.

Gathering and preparing data

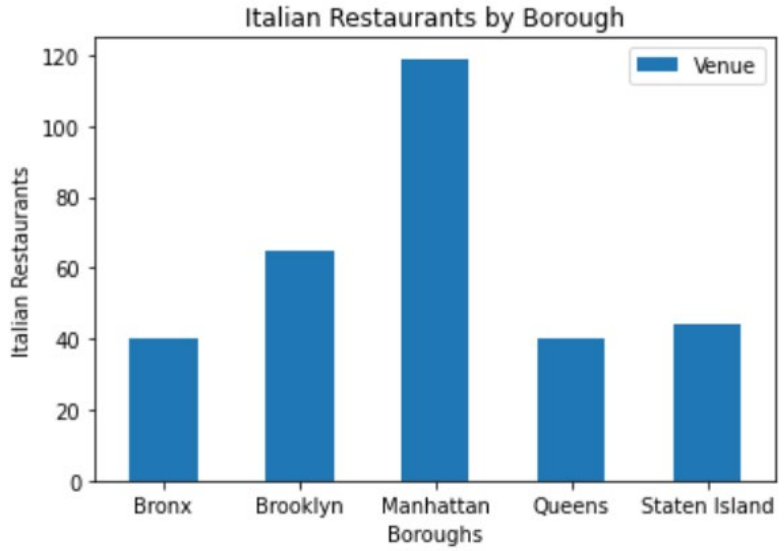
- For this exercise, I downloaded the NYC JSON from Skillsnetwork.
- Using FOURSQUARE API, we have gathered coordinates of NYC neighborhoods and number of Italian restaurants in each neighborhood.
- Using webscrapping technique, we will gather details of population in each Boroughs.
- These data are cleaned and used to produce charts and interactive maps which will help us make better decision.

Italian restaurants in NYC

- This interactive map shows all neighborhoods with number of Italian restaurants on pop-up

Existing Italian restaurant density per Borough

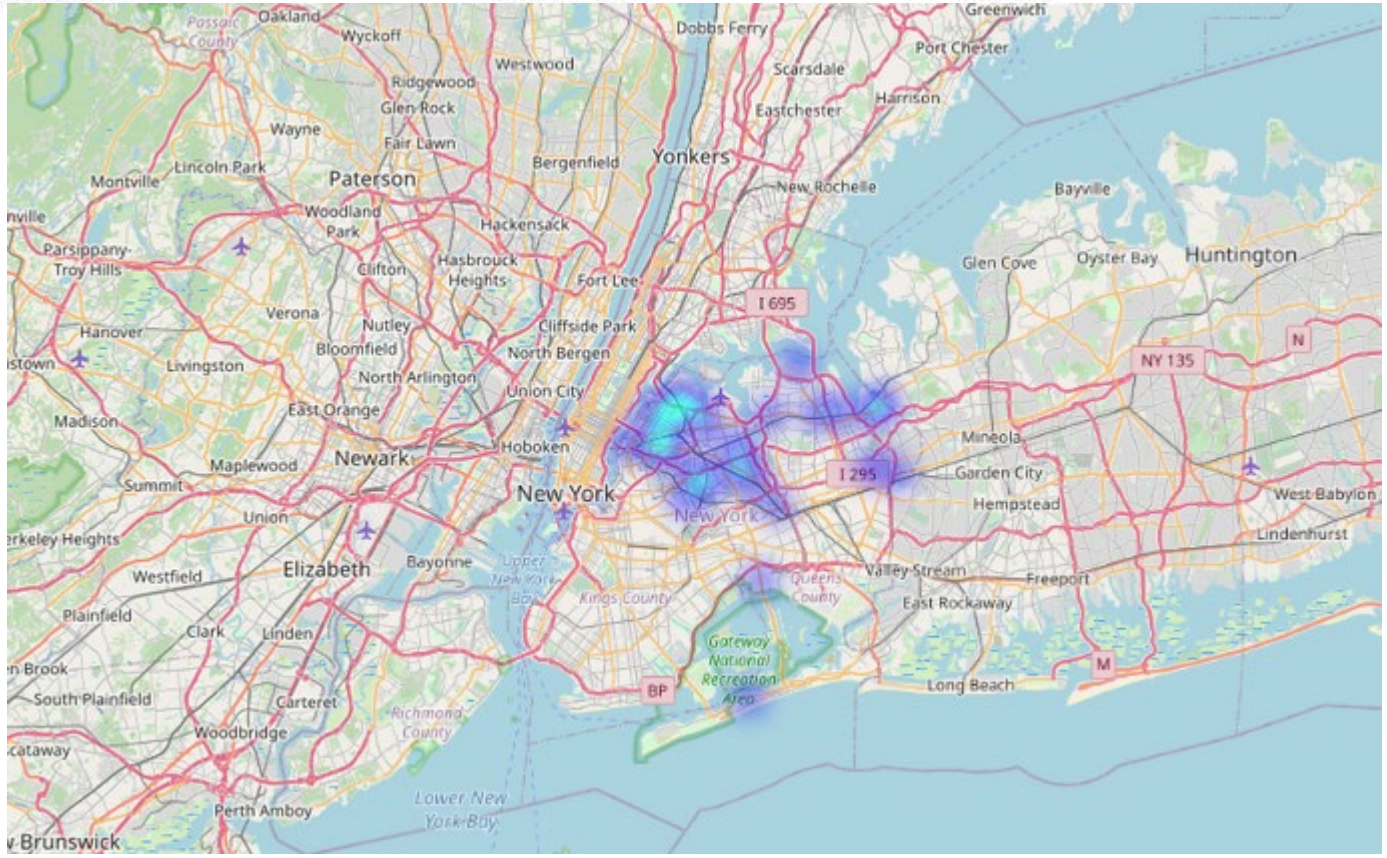
- Bronx and Queens have lowest number of Italian restaurants.
- Considering density per 100,000 population, Queens has lowest. Thus, has greatest potential for opening one.
- We can from below table Queens has lowest density.



	Borough	VenueCount	Population	Per_100thousand
0	Bronx	38	1418207	2.679440
1	Brooklyn	61	2559903	2.382903
2	Manhattan	122	1628706	7.490609
3	Queens	38	2253858	1.685998
4	Staten Island	46	476143	9.660963

Italian restaurants in Queens - Heatmap

- We can see existing restaurants are concentrated in west, north-west of Queens.



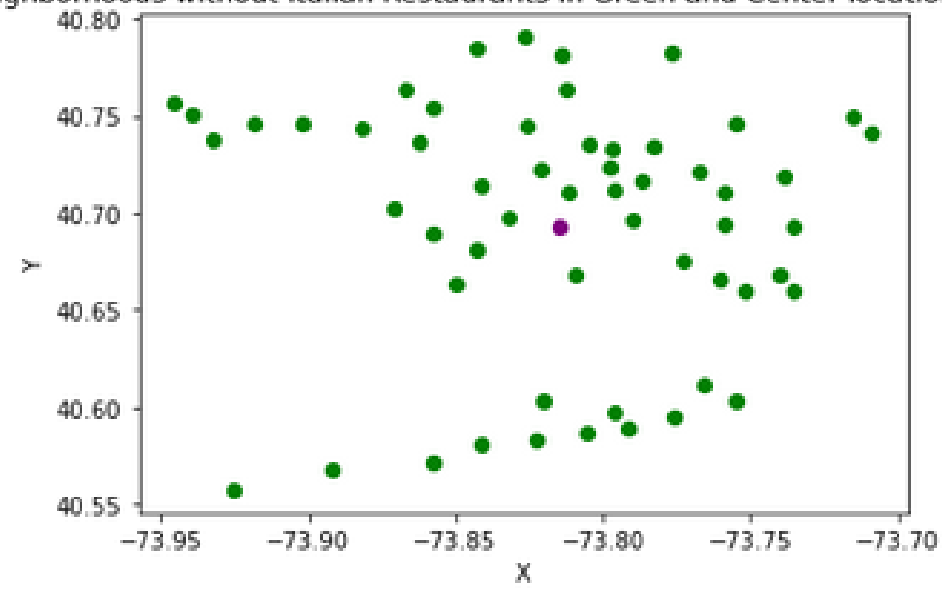
Neighborhoods of Queens with number of Italian restaurants

- The Neighborhoods in Green indicate they do not have any Italian restaurants, Blue indicates neighborhoods having up to 2 and Red indicates neighborhoods having 3 or more.
- Based on Elbow method, we have clustered the neighborhoods of Queens into 3 as shown here.

Bonus: Center location

- We have identified the center location of all the neighborhoods that does not have any Italian restaurant and indicated to the right in Purple. Opening one in and around this location would be ideal.

```
Latitude    40.693519
dtype: float64 Longitude   -73.815132
dtype: float64
```



Conclusion

We have identified neighborhoods that has great potential for opening Italian restaurant. In addition to these, we have highlighted the geo location that is center of all these neighborhoods (40.693519,-73.815132).

Full list in GitHub

	Cluster Labels	Borough	Neighborhood	Latitude	Longitude	VenueCount
1	1	Queens	Woodside	40.746349	-73.901842	0.0
3	1	Queens	Elmhurst	40.744049	-73.881656	0.0
8	1	Queens	Richmond Hill	40.697947	-73.831833	0.0
10	1	Queens	Long Island City	40.750217	-73.939202	0.0
12	1	Queens	East Elmhurst	40.764073	-73.867041	0.0
15	1	Queens	Glendale	40.702762	-73.870742	0.0
17	1	Queens	Woodhaven	40.689887	-73.858110	0.0
18	1	Queens	Ozone Park	40.680708	-73.843203	0.0
19	1	Queens	South Ozone Park	40.668550	-73.809865	0.0
20	1	Queens	College Point	40.784903	-73.843045	0.0
21	1	Queens	Whitestone	40.781291	-73.814202	0.0
26	1	Queens	Glen Oaks	40.749441	-73.715481	0.0
28	1	Queens	Kew Gardens Hills	40.722578	-73.820878	0.0
29	1	Queens	Fresh Meadows	40.734394	-73.782713	0.0
30	1	Queens	Briarwood	40.710935	-73.811748	0.0
32	1	Queens	Oakland Gardens	40.745619	-73.754950	0.0
33	1	Queens	Queens Village	40.718893	-73.738715	0.0
34	1	Queens	Hollis	40.711243	-73.759250	0.0
35	1	Queens	South Jamaica	40.696911	-73.790426	0.0
36	1	Queens	St. Albans	40.694445	-73.758676	0.0