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INTRODUCTION

Restaurants are not an exemptions to the laws of demand and supply. In order to provide value as a restaurant one must not only be able to supply a delicious dish, but also one must consider competition in terms of price and agglomeration. I personally love Asian Fusion Cuisine, but if I was a business owner I would need to differentiate myself. For example it would be extremely difficult to start an Asian Fusion Cuisine Restaurant in China Town due to its massive agglomeration of Asian restaurants. For a restaurant to be successful, one must pick the best location in which to provide a customer the best possible experience. In this Project we will optimize the best location for a restaurant to be successful in terms of agglomeration and competition.

DATA

Having data that is relevant and valuable to our project is essential. Therefore we will be using the following datasets/api

1) GeoJSON information regarding the Neighborhood Names of New York City with corresponding coordinates <https://geo.nyu.edu/catalog/nyu-2451-34572>

2) We will be using an Application Programming Interface (API) from Foursquare that will facilitate us with rich data regarding the neighborhoods of New York City. We will use this API in order to fetch information on venues and analyze neighborhoods.

METHODOLOGY

Once we have accessed the data, we will start analyzing the neighborhoods to create clusters based on popular venues and respective traffic during certain times of the day. We will also analyze the frequency of other restaurants with regards to price range, popular hours and cuisine. Our optimal solution requires a cluster of neighborhoods with a tons of traffic and few numbers of competitors with the same cuisine as ours.

Out[9]:

	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

NEIGHBORHOOD DATA

BROOKLYN VENUES-API

brooklyn_venues

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category	Ve
0	Bay Ridge	40.625801	-74.030621	Pilo Arts Day Spa and Salon	40.624748	-74.030591	Spa	4t
1	Bay Ridge	40.625801	-74.030621	Cocoa Grinder	40.623967	-74.030863	Juice Bar	50
2	Bay Ridge	40.625801	-74.030621	Bagel Boy	40.627896	-74.029335	Bagel Shop	42
3	Bay Ridge	40.625801	-74.030621	Pegasus Cafe	40.623168	-74.031186	Breakfast Spot	42
4	Bay Ridge	40.625801	-74.030621	Ho' Brah Taco Joint	40.622960	-74.031371	Taco Place	46
5	Bay Ridge	40.625801	-74.030621	XIN	40.625082	-74.030494	Chinese Restaurant	56
6	Bay Ridge	40.625801	-74.030621	Leo's Casa Calamari	40.623348	-74.031082	Pizza Place	42
7	Bay Ridge	40.625801	-74.030621	Brooklyn Market	40.626939	-74.029948	Grocery Store	51
8	Bay Ridge	40.625801	-74.030621	Karam	40.622931	-74.028316	Middle Eastern Restaurant	4t
9	Bay Ridge	40.625801	-74.030621	A.L.C. Italian Grocery	40.623051	-74.031224	Grocery Store	50
10	Bay Ridge	40.625801	-74.030621	Mimi Nails	40.622571	-74.031477	Spa	4t

DATA TRANSFORMATIONS

	Borough	Neighborhood	Latitude	Longitude	Counts	Counts	Counts	Frequency	Frequency	Restaurants
0	Brooklyn	Boerum Hill	40.685683	-73.983748	7	13	84	0.083333	0.154762	2.0
1	Brooklyn	Carroll Gardens	40.680540	-73.994654	5	12	100	0.050000	0.120000	0.0
2	Brooklyn	Cobble Hill	40.687920	-73.998561	5	17	100	0.050000	0.170000	2.0
3	Brooklyn	Crown Heights	40.670829	-73.943291	2	4	19	0.105263	0.210526	0.0
4	Brooklyn	Ditmas Park	40.643675	-73.961013	2	14	50	0.040000	0.280000	3.0
5	Brooklyn	Downtown	40.690844	-73.983463	7	15	100	0.070000	0.150000	5.0
6	Brooklyn	East Williamsburg	40.708492	-73.938858	7	5	71	0.098592	0.070423	0.0
7	Brooklyn	Fort Greene	40.688527	-73.972906	6	20	79	0.075949	0.253165	1.0
8	Brooklyn	Gowanus	40.673931	-73.994441	5	10	59	0.084746	0.169492	1.0
9	Brooklyn	Gravesend	40.595260	-73.973471	6	7	30	0.200000	0.233333	2.0
10	Brooklyn	Greenpoint	40.730201	-73.954241	8	12	100	0.080000	0.120000	0.0
11	Brooklyn	Prospect Heights	40.676822	-73.964859	6	15	80	0.075000	0.187500	0.0
12	Brooklyn	Prospect Lefferts Gardens	40.658420	-73.954899	7	16	50	0.140000	0.320000	1.0
13	Brooklyn	Red Hook	40.676253	-74.012759	6	9	48	0.125000	0.187500	0.0
14	Brooklyn	Vinegar Hill	40.703321	-73.981116	3	2	32	0.093750	0.062500	0.0
15	Brooklyn	Weeksville	40.675040	-73.930531	4	3	15	0.266667	0.200000	1.0
16	Brooklyn	Windsor Terrace	40.656946	-73.980073	1	6	25	0.040000	0.240000	1.0

CLUSTERS

arroll ardens	40.680540	-73.994654	5	12	100	0.050000	0.120000	NaN	NaN	3
obble Hill	40.687920	-73.998561	5	17	100	0.050000	0.170000	2.0	0.020000	3
rown Heights	40.670829	-73.943291	2	4	19	0.105263	0.210526	NaN	NaN	2
itmas Park	40.643675	-73.961013	2	14	50	0.040000	0.280000	3.0	0.060000	0
owntown	40.690844	-73.983463	7	15	100	0.070000	0.150000	5.0	0.050000	3
ast /illiamsburg	40.708492	-73.938858	7	5	71	0.098592	0.070423	NaN	NaN	1
ort Greene	40.688527	-73.972906	6	20	79	0.075949	0.253165	1.0	0.012658	1
owanus	40.673931	-73.994441	5	10	59	0.084746	0.169492	1.0	0.016949	0
ravesend	40.595260	-73.973471	6	7	30	0.200000	0.233333	2.0	0.066667	2
reenpoint	40.730201	-73.954241	8	12	100	0.080000	0.120000	NaN	NaN	3
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rospect efferts ardens	40.658420	-73.954899	7	16	50	0.140000	0.320000	1.0	0.020000	0
ed Hook	40.676253	-74.012759	6	9	48	0.125000	0.187500	NaN	NaN	0
inegar Hill	40.703321	-73.981116	3	2	32	0.093750	0.062500	NaN	NaN	2
/eeksville	40.675040	-73.930531	4	3	15	0.266667	0.200000	1.0	0.066667	2
/indsor errace	40.656946	-73.980073	1	6	25	0.040000	0.240000	1.0	0.040000	2

RESULTS

Cluster 2 seems to have a high number of nightlife venues, with very low numbers of Chinese Restaurants, and a balanced number of other Restaurants. This cluster is a good starting point to look for a new location for our restaurant

CONCLUSIONS

Cluster 2 seems to have a high number of nightlife venues, with very low numbers of Chinese Restaurants, and a balanced number of other Restaurants. This cluster is a good starting point to look for a new location for our restaurant

DISCUSSION

We understand that many factors play on find the optimal location in determining the success of a restaurant. Location is a big factor as you would want to have as much traffic as possible, but you also have to provide a valuable service. Competition is another important factor. If there is many restaurant that serve similar dishes, then it will be hard to differentiate from other restaurants. Using the foursquare API helps fetch valuable information regarding agglomeration and competition. We understand that our project is limited to the scope of the information we have to use. Further analysis would require more relevant information and more advanced techniques.