1.INTRODUCTION

New York City , The most vibrant city with vast culture and trends. It provides a lot of opportunities to one. Many people are interested in opening up a restaurant there. It is the heart of, The United States of America. Many diverse cultures are present there which represent their respective countries. This is one of the main focus areas in this field as people crave food from their respective countries.

As the city is famous for tourist attractions, world trade, media ,legal services , insurance , fashion industry, advertising and many other activities. This means that there is highly competitive market which demands high quality services, people even pay for the services however costly it might cost them. Starting a new business here should be evaluated and analyzed carefully. This will help assess all the risk and vulnerability factors, as from the business point of view a good return will be outcome.

Problem description:

Restaurant is a place which serves food to be ordered or ready-made food to its customers bearing to make profit after considering all the combing all the raw material which were used to prepare the dish. NYC has vast varieties of cultural and ethnic food belonging from various diversities.

1. Asian Cuisine – It targets the Indian and Chinese Population at the most .Food such as curries, noodles and rice being their main staple.
2. Central and Eastern European immigrants, especially Jewish immigrants – breads, bagels, cheesecake, hot dogs.
3. Italian immigrants – Targets the overall audience as it is a comforting food -Pizza and Pasta are really well known.
4. Jewish immigrants and Irish immigrants - pastrami and corned beef
5. Mobile food vendors - 2,000~ licensed by the city
6. Middle Eastern – Its mostly for people who are always on the rush and would like to grab a snack on the way. Falafel , Doners and Kebabs are the highlights.
7. Michelin Star restaurants which are fine dining restaurants provide excellent quality of food and various al carte specialties.

So a Strategic plan is needed to survive in a such a competitive market. Various factors need to be studied in order to decide on the Location such as:

1. NYC Population.
2. NYC Demographics.
3. Cost of obtaining ingredients, freshness of ingredients, organic and many other factors to make in outstanding from the others.
4. Prime location where a lot of people are expected to pass though and timings where people show up mostly.
5. Surrounding Competitors.
6. Segmentation of the Borough
7. Cost of renting or owning a place.
8. Initial investments.

These are some of the prime factors which are needed while starting a Restaurant.

The data will be found of Foursquare which will be used to analyze on opening a restaurant.

It will start out by choosing a location for the restaurant, this data can be sought out in various real estate websites. We need to find the target audience for this as opening a multi cruise place might lead to a downfall. Locating and obtaining ingredients in the most natural and easy way which should be cost effective. A place where a lot of people eat out during lunch hours, a metropolitan area preferably. Need to know who you will be against with and more so ever the quality of food.

So,my current assessment will be on what type of restaurant should be opened at (40.7127281,-74.0060152) this particular location .

This is where the City Hall is located and a lot of people visit this place during the day and a very populated area during the night as there is a park there.

2.DATA ACQUISITION AND CLEANSING

2.1 Obtaining Data sets.

2.1.1 NYCinfo

There are currently 5 boroughs in the City of NYC.This data set provides information on Population, GDP, Land Area and Density. The data was obtained from Wikipedia.

https://en.wikipedia.org/wiki/Demographics_of_New_York_City

2.1.2 Typesofcrusine

This dataset has all the restaurant details and the necessary information which has the location, building, street, phone, cuisine description.

This dataset was obtained from kaggle.

https://www.kaggle.com/new-york-city/nyc-inspections/data

2.1.3 Markets

It contains all the information on the farmers market which are present in the City of NYC .It gives information on about how often they occur and the different location they are present.

This data was obtained from NYCOpenData.

https://data.cityofnewyork.us/dataset/DOHMH-Farmers-Markets/8vwk-6iz2

2.1.4 Venues

Numerous data factors are present in this, such as the location, neighborhood its present in , venue location and category.

This helps us determine how many restaurants are present in the particular area and where likely a new one should be opened.

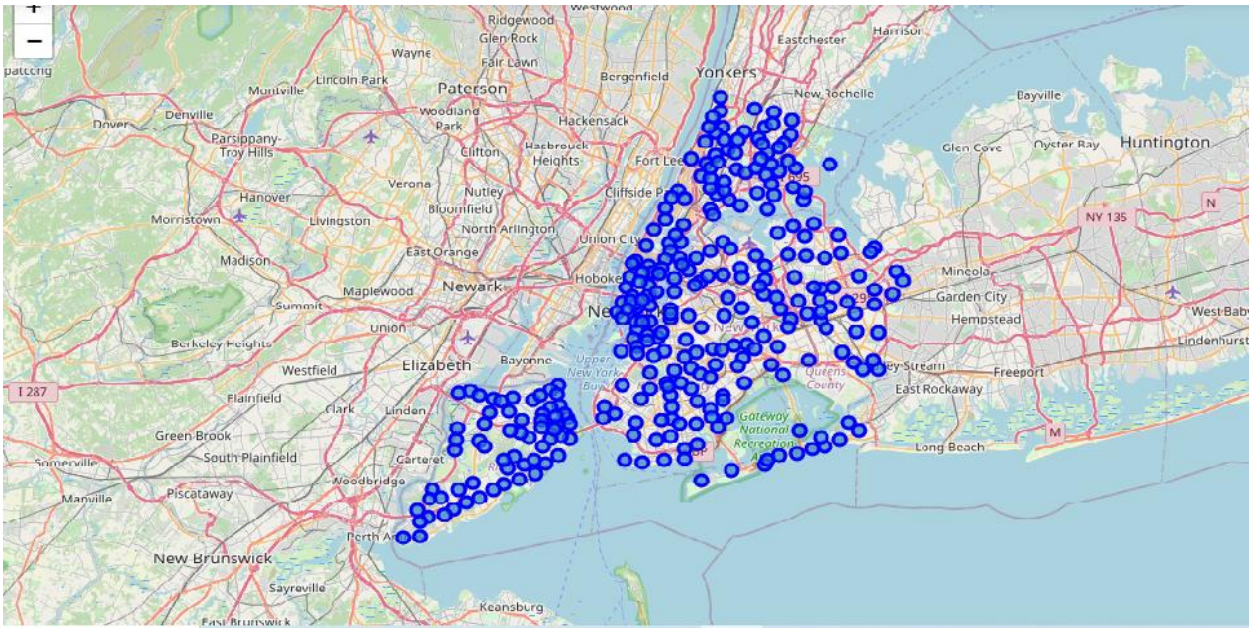
https://api.foursquare.com/v2/venues/explore?client_id=C4T1QHZIFG32BCDRYUSJDDPWMSJXLDV0X2IUV5O55IDHBL20&client_secret=54MBDXFWRDOSW5YV4WDL1M13FUNF5YAYUZJT4EVDPVSXKWME&v=20181218&ll=40.7127281,-74.0060152

2.2 Cleansing

The above data was Cleansed and defined as needed for this analysis. It was done by simple replace functions. “/n/r” parts which were included in the dataset were removed. It was effective in most parts but some still had them. It made the data more subtle and prettified.

3.Methodology

3.1 Business approach



Out of the many places which are present in the map, the main idea is to open a restaurant/café near The City Hall .The City Hall is one of the most happening places in the whole of NYC as there are court rooms and a park right in front of it. It even has a Subway Station where many people travel there.

Out of the 5 borough and 306 neighborhoods. The place I have chosen is the Civic Center, Manhattan region.

The coordinates of the place is 40.7127281,-74.0060152.

```
In [9]: print('The dataframe has {} boroughs and {} neighborhoods.'.format(
            len(neighborhoods['Borough'].unique()),
            neighborhoods.shape[0]
        )
    )
```

```
The dataframe has 5 boroughs and 306 neighborhoods.
```

3.2 APPROACH

Firstly, I found out the top 3 Restaurants around the Civic Center region. This was done by getting using Foursquare.

```
In [28]: restaurant_List = []
         search = 'Restaurant'
         for i in BM_onehot.columns :
             if search in i:
                 restaurant_List.append(i)

In [29]: restaurant_List

Out[29]: ['Falafel Restaurant', 'Molecular Gastronomy Restaurant', 'Sushi Restaurant']
```

The 3 main sought after and happening restaurants where a Falafel Restaurant, Molecular Gastronomy and Sushi restaurant in the particular surroundings.

```
Racial composition 2010
White                          :44%
Non-Hipsanic                   :33.3%
Black or African American:25.5%
Hispanic or Latino             :28.6%
Asian                          :12.7%
```

A Racial composition was done during 2010 of the number of people in New York City, the numbers might have changed but it's a rough estimate.

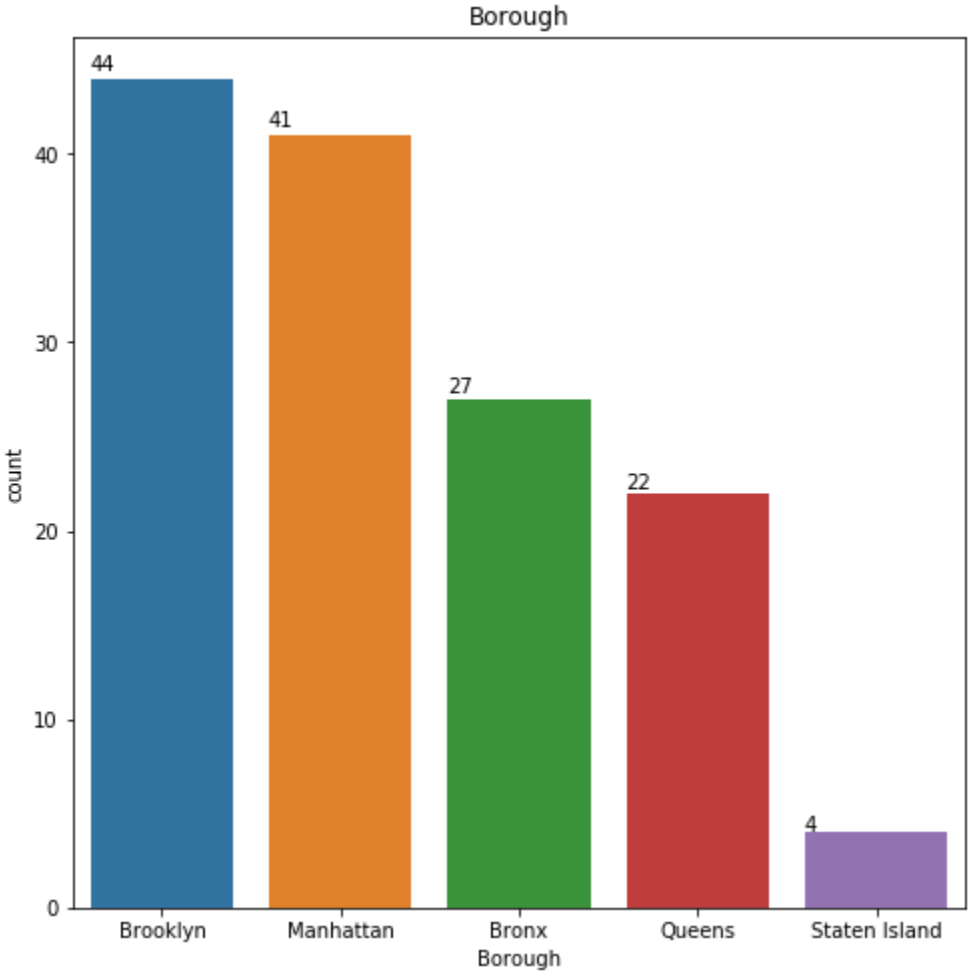
The diversity of the people in that area is vast and it cannot be justified to a single major category as it is a main happening area.

The output below defines the different types of venues in the city so while assessing it we can tend to find out a unique place to open up, as we can see the Kathi Rolls Restaurant's aren't all over the city.

```
In [38]: BM_venues.groupby('VenueCategory')['Venue'].count().sort_values(ascending=False)

Out[38]: VenueCategory
         Hotel                          220
         Sandwich Place                 220
         Park                           220
         Gym                            220
         Gym / Fitness Center           110
         Building                       110
         Burger Joint                   110
         Burrito Place                  110
         Café                           110
         Coffee Shop                    110
         Comic Shop                     110
         Dance Studio                   110
         Falafel Restaurant             110
         Furniture / Home Store         110
         Yoga Studio                    110
         Taco Place                     110
         Hotel Bar                      110
         Laundry Service                110
         Liquor Store                   110
         Molecular Gastronomy Restaurant 110
         Monument / Landmark            110
         Pizza Place                    110
         Plaza                          110
         Spa                            110
         Sushi Restaurant               110
         Bakery                         110
```

Finding a farmers market as to support locally and organically produce. This also helps support local farmers who are present right out of the city.



So in the Manhattan Borough there are a total of 41 farmer markets.

We need to assess the timings and days of operation which are favorable to the owner to get his produce and necessary items.

The chart below depicts the number of farmer market places and their days of operation. So we need to find a perfect place which is in the Manhattan Region and is open most days of the week. An Alternative solution will be to find 2 places as during the days off of the other market, we could get the produce from this place.

	Days_operation
Saturday	39
Wednesday	22
Sunday	18
Thursday	16
Friday	11
Tuesday	10
Wednesday & Saturday	4
Tuesday & Friday	3
Wednesday & Sunday	1
Tuesday & Thursday	1
Tuesday &\n Saturday	1
Monday,\nWednesday,\nFriday & Saturday	1
Tuesday, Thursday & Saturday	1
Thursday & Saturday	1
Wednesday &\n Saturday	1
Tuesday &\nFriday	1
Wednesday,\nThursday & Friday	1
Monday	1
Thursday & Sunday	1
Tuesday &\nThursday	1

There are only 28 places which are open throughout the year , need to find a place which is open throughout the year so a bond can be created between the 2 parties and it all goes well,

	Open_year_around
No	109
Yes	28

Greenmarket at Oculus Plaza is open on Monday, Wednesday, Friday and Saturday

Tucker Square Greenmarket is open on Tuesday and Thursday.

These 2 are the most ideal places to get produce from as it is present is Manhattan itself and they don't have to travel much.

3.3 CLUSTERING

k-means

In [83]:
```
# set number of clusters
kclusters = 2

BM_grouped_clustering = BM_restaurant_grouped.drop('Neighborhood', 1)

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(BM_grouped_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels
```

Out[83]:
```
array([1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1,
       1, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0,
       1, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 0, 0,
       1, 0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 1, 1, 0, 0, 1, 0, 0, 1, 1,
       1, 0, 1, 1, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 0, 1], dtype=int32)
```

In [84]:
```
BM_results = pd.DataFrame(kmeans.cluster_centers_)
BM_results.columns = BM_grouped_clustering.columns
BM_results.index = ['cluster0','cluster1']
BM_results['Total Sum'] = BM_results.sum(axis = 1)
BM_results
```

Out[84]:

	African Restaurant	American Restaurant	Arepa Restaurant	Argentinian Restaurant	Asian Restaurant	Australian Restaurant	Austrian Restaurant	Brazilian Restaurant	Burmese Restaurant
cluster0	0.044444	1.088889	0.022222	0.022222	0.155556	-1.387779e-17	-1.387779e-17	-1.734723e-18	-1.734723e-18
cluster1	0.076923	2.153846	0.107692	0.092308	0.676923	1.230769e-01	1.230769e-01	1.538462e-02	1.538462e-02

The nearest mean was found out and these were the results.

4.RESULTS

1.From the above data which has been analyzed,Cluster 0: Shows the entire restaurant business which has the lowest value.
Cluster 1 : Shows the entire restaurant business which has the highest .
2. Green Day market and Tucker Square market are the most likely and best place in Manhattan to get Produce from.
3. It is easy to open a Kathi Roll place in Civic Center Region as Kathi roll is a easy hand food and isn't messy as all the people in NYC are always in a rush and this is a good take away food or on the run food.

5.CONCLUSION

1. People are used to trying something new ,this makes it easy for this business to run as it gives them a new opportunity to try it.
2. This can be used to put into various other regions of NYC which attracts people.
3.This has been performed on specific data ,a broader analysis can be done while adding different cuisines as mix up.