Data Acquisition:

For the project, we are collecting data of Bangalore.

Steps to be followed for data acquisition:

1. With the help of geopy library, I got the longitude and latitude of Bangalore.

From the geopy library e are able to find the latitude and longitude of Banglore

```
[3]  1 print('Latitude = {}, Longitude = {}'.format(location.latitude, location.longitude))
     2 bang_lat,bang_long = location.latitude, location.longitude
```

```
Latitude = 12.9791198, Longitude = 77.5912997
```

2. As Bangalore is large city , so from the centre of Bangalore I am covering an area of 12x12 km. Further I have distributed the area into hexagonal shape. Using python function convert the lat,lon in X-Y co-ordinates. We got the latitude and longitude of all the 364 neighbourhood. From reverse geopy , by giving the lat,lon of the different cluster , we will able to find the area/address of that segment. By combining all the data's made one dataframe with address, lat, lon ,x,y and distance from centre as fields.

	Address	Latitude	Longitude	X	Y	Distance from center
0	Fort High School, Krishna Rajendra Road, Maval...	12.958821	77.573128	8.885556e+06	2.961840e+06	5992.495307
1	Dharmaraya Swamy Temple Ward, South Zone, Beng...	12.957730	77.575652	8.886156e+06	2.961840e+06	5840.376700
2	Dharmaraya Swamy Temple Ward, South Zone, Beng...	12.956640	77.578175	8.886756e+06	2.961840e+06	5747.173218
3	Hindustan Petroleum, Proposed Hudson Cricle - ...	12.955549	77.580699	8.887356e+06	2.961840e+06	5715.767665
4	New car designer, Lalbagh Fort Road, Mavalli, ...	12.954459	77.583222	8.887956e+06	2.961840e+06	5747.173218
5	Lalbagh Botanical Gardens, ಪಾದಚಾರಿ ಮಾರ್ಗ, Mava...	12.953369	77.585744	8.888556e+06	2.961840e+06	5840.376700
6	Lalbagh Botanical Gardens, ಪಾದಚಾರಿ ಮಾರ್ಗ, Mava...	12.952279	77.588267	8.889156e+06	2.961840e+06	5992.495307
7	St. Joseph's School, Cottonpete Main Road, K R...	12.962601	77.570305	8.884656e+06	2.962360e+06	5855.766389
8	Bangalore Medical College Hospitals, ಸುಲ್ತಾನ್ ...	12.961510	77.572829	8.885256e+06	2.962360e+06	5604.462508
9	Srinidhi Sagar, 2, Krishna Rajendra Road, K R ...	12.960419	77.575353	8.885856e+06	2.962360e+06	5408.326913

Fig1:Sample of data from dataframe

Now I have used four square API to get the restaurant present in the neighbour . From (‘*https://developer.foursquare.com/docs/resources/categories’*).From t his I find out the list of the restaurants in the area and store the values in the v ariable.

Again, from API find out the list of Italian restaurant present in the neighbourhood. And made new data frame from all the extracted data.

Address	Latitude	Longitude	X	Y	Distance from center	Restaurants in area	Distance to Italian restaurant
Fort High School, Krishna Rajendra Road, Maval...	12.958821	77.573128	8.885556e+06	2.961840e+06	5992.495307	1	5225.267649
Dharmaraya Swamy Temple Ward, South Zone, Beng...	12.957730	77.575652	8.886156e+06	2.961840e+06	5840.376700	1	4813.516635
Dharmaraya Swamy Temple Ward, South Zone, Beng...	12.956640	77.578175	8.886756e+06	2.961840e+06	5747.173218	4	4444.824269
Hindustan Petroleum, Proposed Hudson Cricle - ...	12.955549	77.580699	8.887356e+06	2.961840e+06	5715.767665	4	4130.736395
New car designer, Lalbagh Fort Road, Mavalli, ...	12.954459	77.583222	8.887956e+06	2.961840e+06	5747.173218	1	3884.521019
Lalbagh Botanical Gardens, ಪಾದಚಾರಿ ಮಾರ್ಗ, Mava...	12.953369	77.585744	8.888556e+06	2.961840e+06	5840.376700	3	3719.680623

Fig1:Sample of data from dataframe along with the distance of the Italian restaurant

From the data from above data frames, I will use K-Means and distribute the map in segments. And again distribute the restaurants in cluster.

At last try to find out which cluster would be good for opening the Italian restaurant.

Data for the latitude and longitude of city we can get data also from kaggle: https://www.kaggle.com/rmenon1998/bangalore-neighborhoods/data#