

# Capstone Project - The Battle of the Neighborhoods

## Applied Data Science Capstone by IBM/Coursera

### Introduction: Business Problem

In this project we will try to find an optimal location for a restaurant. Specifically, this report will be targeted to stakeholders interested in opening an **South indian** in **New Delhi**, India.

Since there are lots of restaurants in New Delhi we will try to detect **locations that are not already crowded with restaurants**. We are also particularly interested in **areas with no South indian in vicinity**. We would also prefer **locations as close to city center as possible**, assuming that first two conditions are met.

We will use our data science powers to generate a few most promising neighborhoods based on this criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

### Data

Based on definition of our problem, factors that will influence our decision are:

- number of existing restaurants in the neighborhood (any type of restaurant)
- number of and distance to South indian restaurants in the neighborhood, if any
- distance of neighborhood from city center

We decided to use regularly spaced grid of locations, centered around city center, to define our neighborhoods.

- For this project we will use [Kaggle Zomato dataset](#). This data set contains the required information. And we will use this data set to explore various locality of new delhi city.
- number of restaurants and their type and location in every neighborhood will be obtained using **Foursquare API**

In [1]:

```
!pip install pyproj
```

```
Collecting pyproj
  Downloading https://files.pythonhosted.org/packages/e4/ab/280e80a67cfc109d15428c0ec56391fc03a65857b7727cf4e6e6f99a4204/pyproj-3.0.0.post1-cp36-cp36m-manylinux2010_x86_64.whl (6.4MB)
    |████████████████████| 6.5MB 6.7MB/s
Requirement already satisfied: certifi in /usr/local/lib/python3.6/dist-packages (from pyproj) (2020.12.5)
Installing collected packages: pyproj
Successfully installed pyproj-3.0.0.post1
```

In [2]:

```
import warnings
warnings.filterwarnings("ignore", category=DeprecationWarning)
```

In [3]:

```
import pandas as pd
import numpy as np
import requests # library to handle requests
from pandas.io.json import json_normalize # tranform JSON file into a pandas dataframe
# Matplotlib and associated plotting modules
```

```
Collecting geocoder
  Downloading https://files.pythonhosted.org/packages/4f/6b/13166c909ad2f2d76b929a4227c952630ebaf0d729f6317eb09cbceccbab/geocoder-1.38.1-py2.py3-none-any.whl (98kB)
    | ████████████████████████████████████████ | 102kB 4.7MB/s
Collecting ratelim
  Downloading https://files.pythonhosted.org/packages/f2/98/7e6d147fd16a10a5f821db6e25f192265d6ecca3d82957a4fdd592cad49c/ratelim-0.1.6-py2.py3-none-any.whl
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from geocoder) (1.15.0)
Requirement already satisfied: requests in /usr/local/lib/python3.6/dist-packages (from geocoder) (2.23.0)
Requirement already satisfied: future in /usr/local/lib/python3.6/dist-packages (from geocoder) (0.16.0)
Requirement already satisfied: click in /usr/local/lib/python3.6/dist-packages (from geocoder) (7.1.2)
Requirement already satisfied: decorator in /usr/local/lib/python3.6/dist-packages (from ratelim->geocoder) (4.4.2)
Requirement already satisfied: urllib3!=1.25.0,!<1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.6/dist-packages (from requests->geocoder) (1.24.3)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.6/dist-packages (from requests->geocoder) (2.10)
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packages (from requests->geocoder) (3.0.4)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.6/dist-packages (from requests->geocoder) (2020.12.5)
Installing collected packages: ratelim, geocoder
Successfully installed geocoder-1.38.1 ratelim-0.1.6
```

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century City Mall, Poblacion, Makati City, Mak...	121.027535	14.565443	French, Japanese, Desserts
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	14.553708	Japanese
2	6300002	Heat - Edsa	162	Mandaluyong City	Edsa Shangri-La, 1 Garden	Edsa Shangri-La, Ortigas,	Edsa Shangri-La, Ortigas,	121.056831	14.581404	Seafood, Asian, Filipino

Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O...	SM Megamall, Ortigas, Mandaluyong City	121.056475	14.585318	Japanese, Sushi
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas...	SM Megamall, Ortigas, Mandaluyong City	121.057508	14.584450	Japanese, Korean

## Select only New Delhi and India data from the dataset

In [5]:

```
df_india = df[df['Country Code'] == 1]
df_delhi = df_india[df_india['City'] == 'New Delhi']
df_delhi.reset_index(drop=True, inplace=True)
df_delhi.head()
```

Out[5]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines	Average Cost for two	Currency
0	18287358	Food Cloud	1	New Delhi	Aaya Nagar, New Delhi	Aaya Nagar	Aaya Nagar, New Delhi	0.000000	0.000000	Cuisine Varies	500	Indian Rupee
1	18216944	Burger.in	1	New Delhi	84, Near Honda Showroom, Adchini, New Delhi	Adchini	Adchini, New Delhi	77.196923	28.535382	Fast Food	350	Indian Rupee
2	313333	Days of the Raj	1	New Delhi	81/3, 1st Floor, Qutub Residency, Adchini, New...	Adchini	Adchini, New Delhi	77.197475	28.535493	North Indian, Seafood, Continental	1500	Indian Rupee
3	18384127	Dilli Ka Dhaba	1	New Delhi	66 A, Ground Floor, Sri Aurobindo Marg, Adchin...	Adchini	Adchini, New Delhi	77.198033	28.537547	South Indian, North Indian	500	Indian Rupee
4	582	Govardhan	1	New Delhi	84, Adjacent Hero Motor Bike Showroom, Main Me...	Adchini	Adchini, New Delhi	77.196924	28.535523	South Indian, North Indian, Chinese	500	Indian Rupee

## Cleaning of data

remove unwanted values and columns from the dataset

In [6]:

```
df_new = df_delhi[df_delhi.Longitude !=0.000000][['Restaurant Name',
                                                    'Locality', 'Longitude',
                                                    'Latitude', 'Cuisines',
                                                    'Aggregate rating',
                                                    'Rating text', 'Votes']]
```

In [7]:

```
df_new = df_new[df_new['Aggregate rating'] != 0.0]
```

In [8]:

```
df_new.head()
```

Out[8]:

	Restaurant Name	Locality	Longitude	Latitude	Cuisines	Aggregate rating	Rating text	Votes
1	Burger.in	Adchini	77.196923	28.535382	Fast Food	3.2	Average	46
2	Days of the Raj	Adchini	77.197475	28.535493	North Indian, Seafood, Continental	3.4	Average	45
3	Dilli Ka Dhaba	Adchini	77.198033	28.537547	South Indian, North Indian	2.6	Average	11
4	Govardhan	Adchini	77.196924	28.535523	South Indian, North Indian, Chinese	3.4	Average	238
5	Mezbaan Grills	Adchini	77.198122	28.538134	Mughlai	3.1	Average	8

In [9]:

```
df_new.shape
```

Out[9]:

```
(3975, 8)
```

## Get the latitude and longitude of New Delhi

In [10]:

```
from geopy.geocoders import Nominatim
```

In [11]:

```
def get_latlong(city, country):
    geolocator = Nominatim(user_agent="my_user_agent")
    loc = geolocator.geocode(city+', '+ country)
    lat, lon = loc.latitude, loc.longitude
    return lat, lon
```

In [12]:

```
delhi_center = get_latlong("New Delhi", 'India')
delhi_center
```

Out[12]:

```
(28.6138954, 77.2090057)
```

## created map to show the restaurant cluters

In [13]:

```
New_Delhi_Rest = folium.Map(location=delhi_center, zoom_start=12)
```

```
X = df_new['Latitude']
```

```

Y = df_new['Longitude']
Z = np.stack((X, Y), axis=1)

kmeans = KMeans(n_clusters=5, random_state=0).fit(Z)

clusters = kmeans.labels_
colors = ['red', 'green', 'blue', 'yellow', 'orange']
df_new['Cluster'] = clusters

for latitude, longitude, Locality, cluster in zip(df_new['Latitude'], df_new['Longitude'], df_new['Locality'], df_new['Cluster']):
    label = folium.Popup(Locality, parse_html=True)
    folium.CircleMarker(
        [latitude, longitude],
        radius=5,
        popup=label,
        color='black',
        fill=True,
        fill_color=colors[cluster],
        fill_opacity=0.7).add_to(New_Delhi_Rest)

```

New\_Delhi\_Rest

Out[13]:

**Make this Notebook Trusted to load map: File -> Trust Notebook**

## What places are have best restaurant in New Delhi?

In [14]:

```

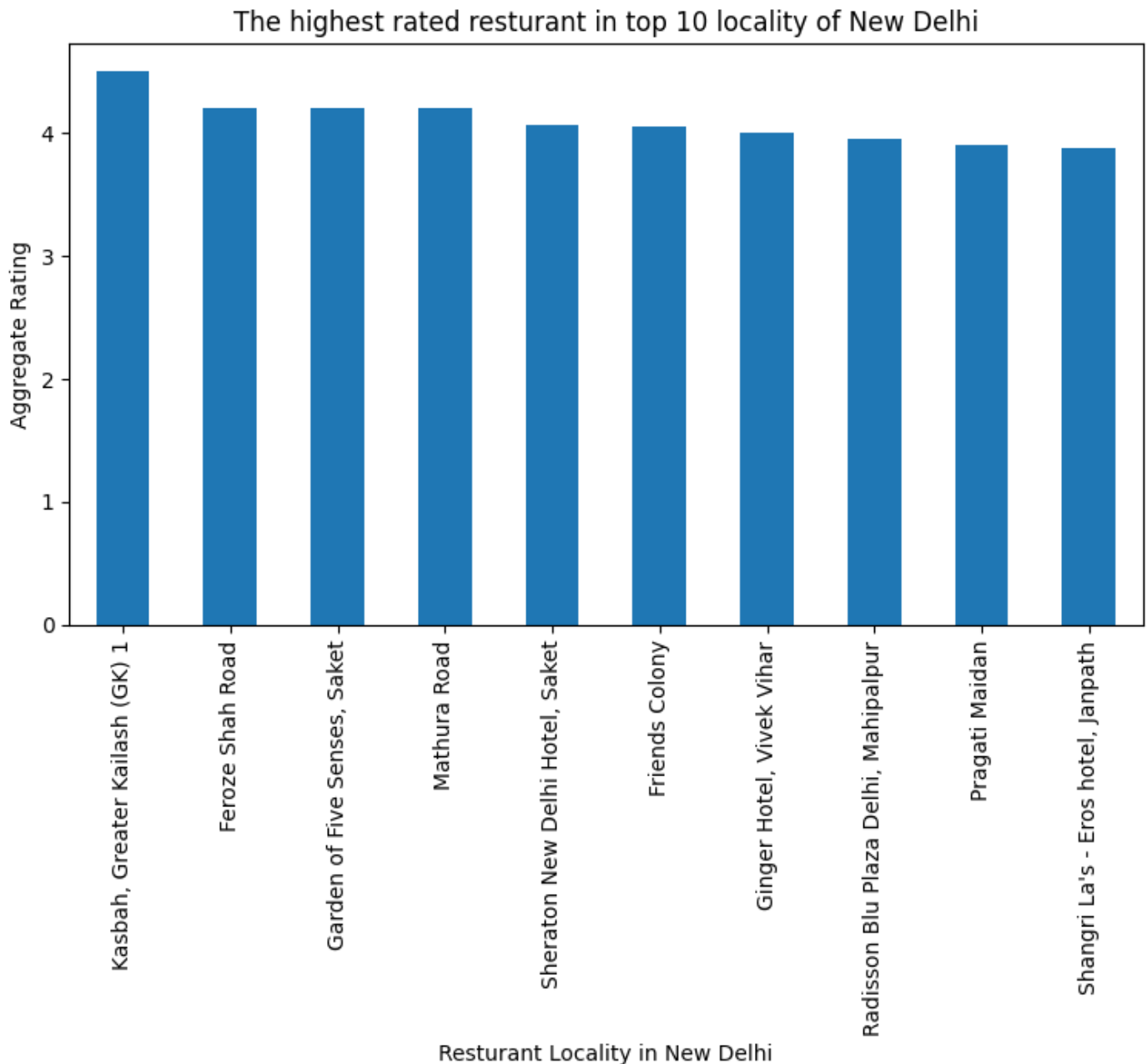
import matplotlib.pyplot as plt
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('The highest rated resturant in top 10 locality of New Delhi')
#On x-axis

#giving a bar plot
df_new.groupby('Locality')['Aggregate rating'].mean().nlargest(10).plot(kind='bar')

plt.xlabel('Resturant Locality in New Delhi')
#On y-axis
plt.ylabel('Aggregate Rating')

```

```
#displays the plot  
plt.show()
```



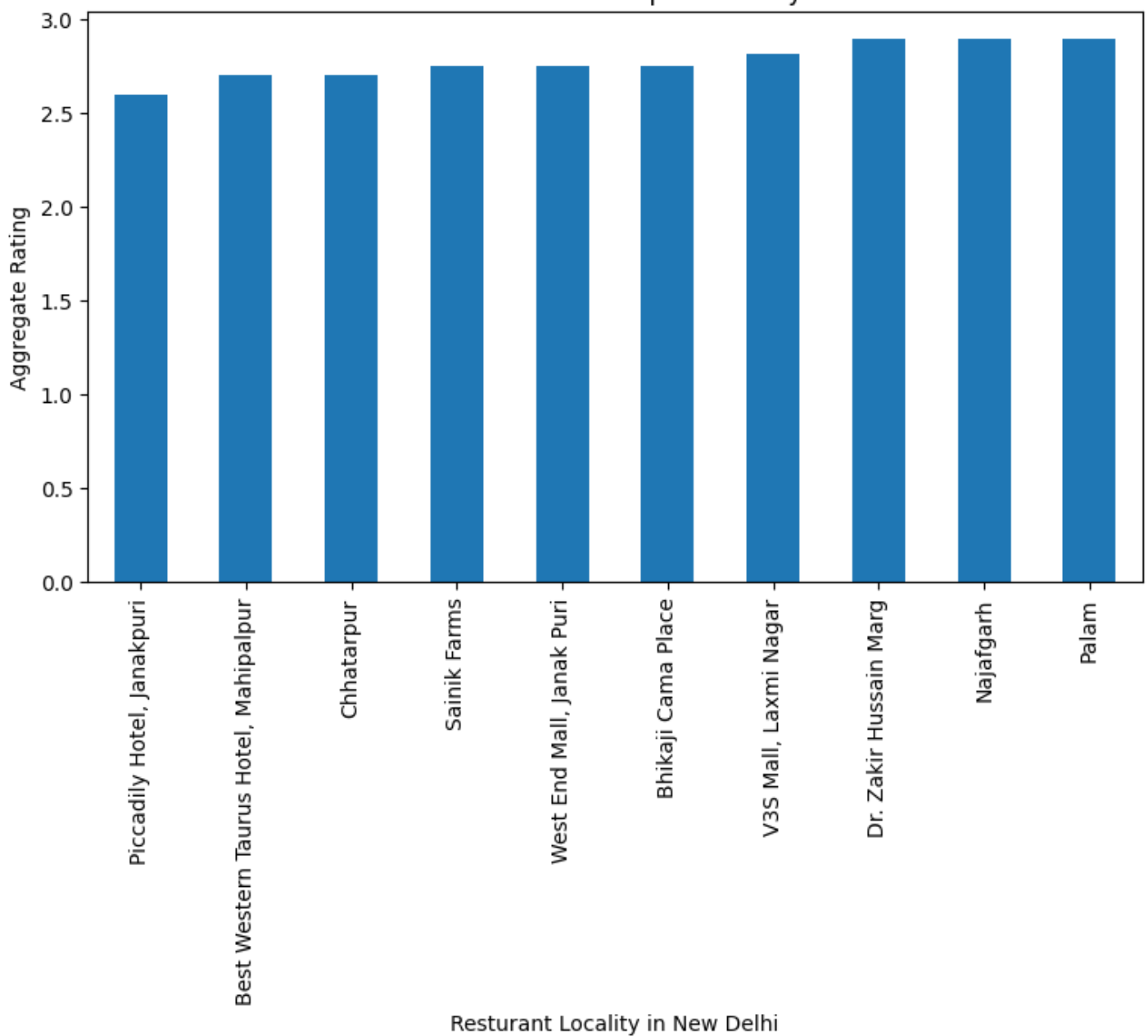
The best restarants are available in Kesbah, Greater Kailash area.

## what places are have worst restaurants in New Delhi?

In [15]:

```
import matplotlib.pyplot as plt  
plt.figure(figsize=(9,5), dpi = 100)  
# title  
plt.title('The Worst rated resturant in top 10 locality of New Delhi')  
#On x-axis  
  
#giving a bar plot  
  
df_new.groupby('Locality')['Aggregate rating'].mean().nsmallest(10).plot(kind='bar')  
  
plt.xlabel('Resturant Locality in New Delhi')  
#On y-axis  
plt.ylabel('Aggregate Rating')  
  
#displays the plot  
plt.show()
```

The Worst rated resturant in top 10 locality of New Delhi



The worst restarants are available in Piccadilly Hotel, Janakpuri.

## Area that have highest numbers of Resturant

In [16]:

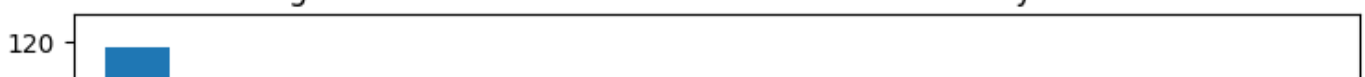
```
import matplotlib.pyplot as plt
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('The highest number of Restaurant available in Locality of New Delhi')
#On x-axis

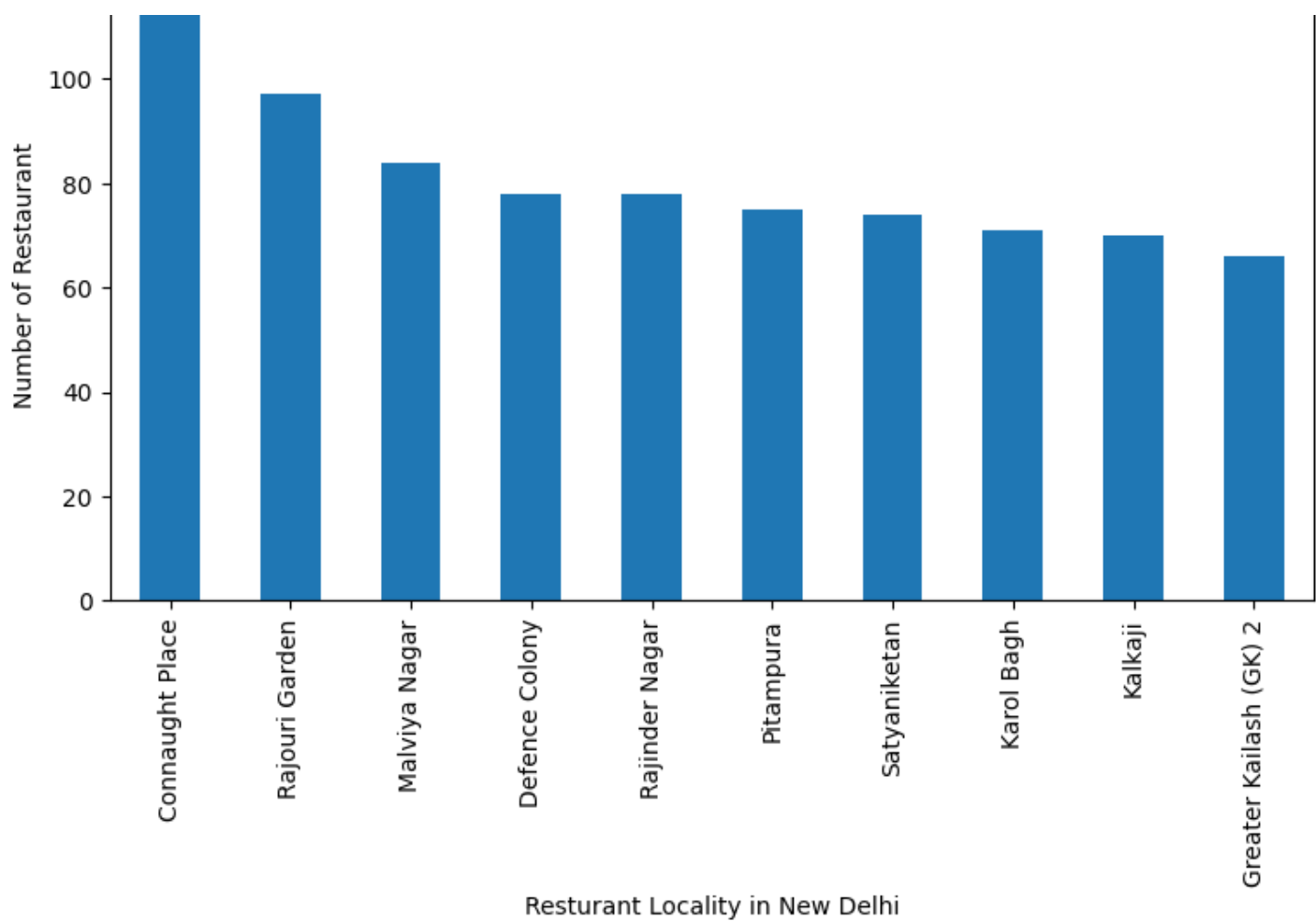
#giving a bar plot
df_new.groupby('Locality')['Restaurant Name'].count().nlargest(10).plot(kind='bar')

plt.xlabel('Resturant Locality in New Delhi')
#On y-axis
plt.ylabel('Number of Restaurant')

#displays the plot
plt.show()
```

The highest number of Restaurant available in Locality of New Delhi

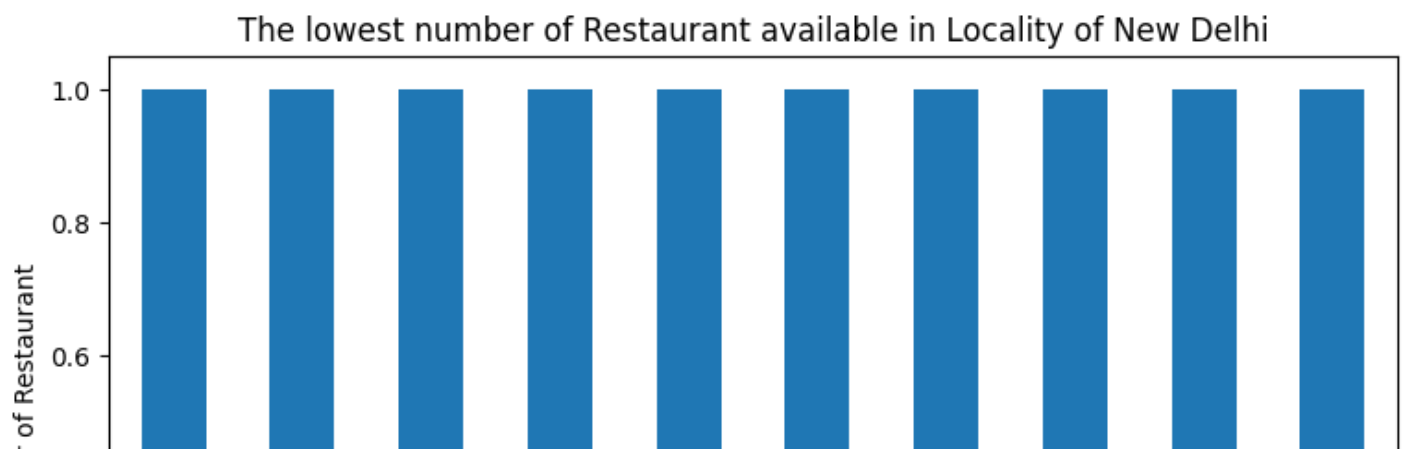




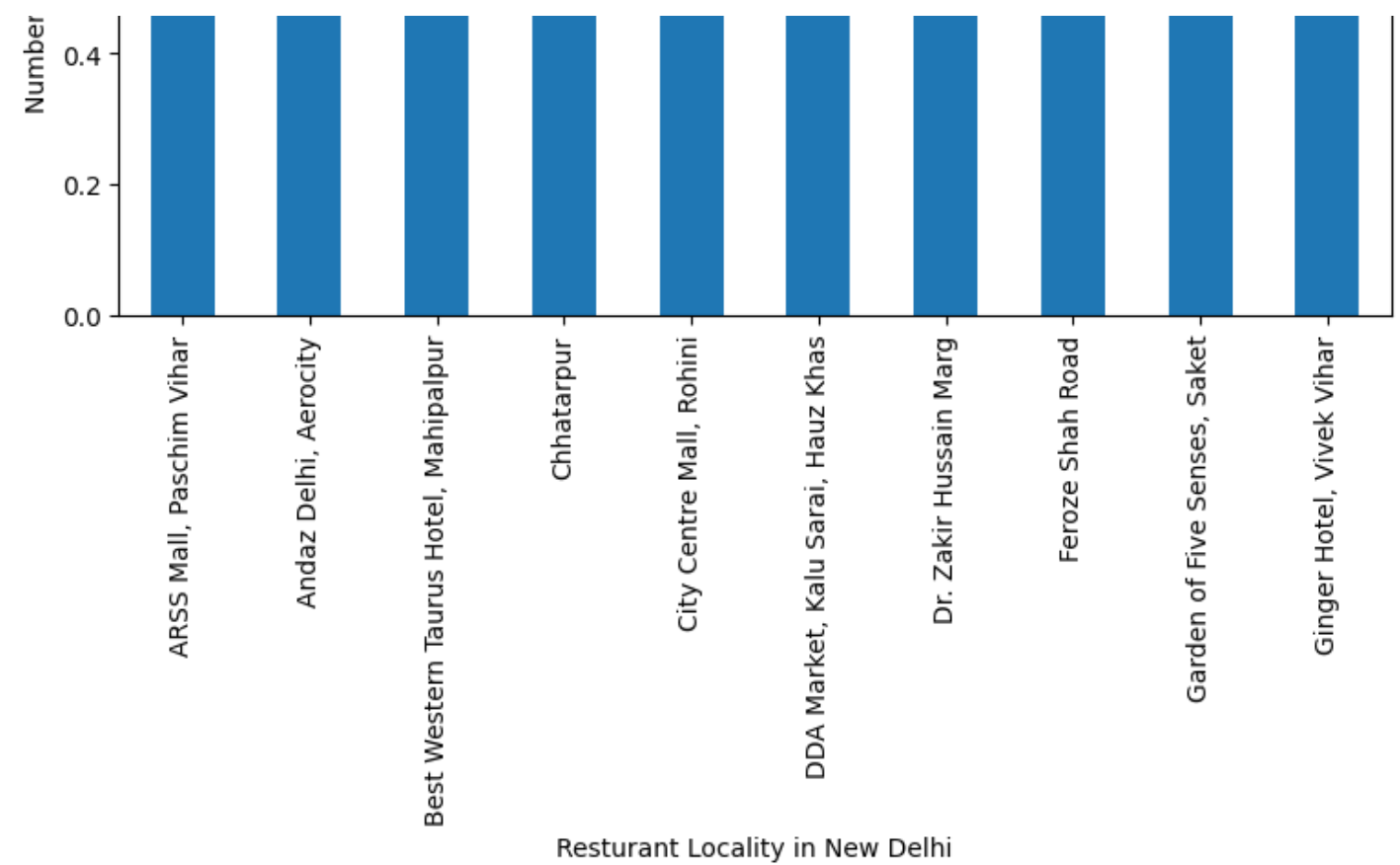
Cannaught palace have maximum numbers of resturant

## Which area have least numbers of Resturant

```
In [17]:  
  
import matplotlib.pyplot as plt  
plt.figure(figsize=(9,5), dpi = 100)  
# title  
plt.title('The lowest number of Restaurant available in Locality of New Delhi')  
#On x-axis  
  
#giving a bar plot  
df_new.groupby('Locality')['Restaurant Name'].count().nsmallest(10).plot(kind='bar')  
  
plt.xlabel('Resturant Locality in New Delhi')  
#On y-axis  
plt.ylabel('Number of Restaurant')  
  
#displays the plot  
plt.show()
```







In [18]:

```
df_new
```

Out[18]:

	Restaurant Name	Locality	Longitude	Latitude	Cuisines	Aggregate rating	Rating text	Votes	Cluster
1	Burger.in	Adchini	77.196923	28.535382	Fast Food	3.2	Average	46	1
2	Days of the Raj	Adchini	77.197475	28.535493	North Indian, Seafood, Continental	3.4	Average	45	1
3	Dilli Ka Dhaba	Adchini	77.198033	28.537547	South Indian, North Indian	2.6	Average	11	1
4	Govardhan	Adchini	77.196924	28.535523	South Indian, North Indian, Chinese	3.4	Average	238	1
5	Mezbaan Grills	Adchini	77.198122	28.538134	Mughlai	3.1	Average	8	1
...	...	...	...	...	...	...	...	...	...
5445	Sona Restaurant	Yusuf Sarai	77.207269	28.561800	North Indian, Mughlai	3.2	Average	30	1
5446	Uraki	Yusuf Sarai	77.213345	28.562265	Asian	2.7	Average	8	4
5447	Wah Ji Wah	Yusuf Sarai	77.207476	28.559942	North Indian	3.0	Average	25	1
5448	Annapurna Sweets	Yusuf Sarai	77.207147	28.557910	Mithai, Street Food	3.9	Good	109	1
5449	Karnataka	Yusuf Sarai	77.207237	28.559442	South Indian, North Indian, Chinese	3.7	Good	334	1

3975 rows × 9 columns

which places are the best South indian resturants in New Delhi?

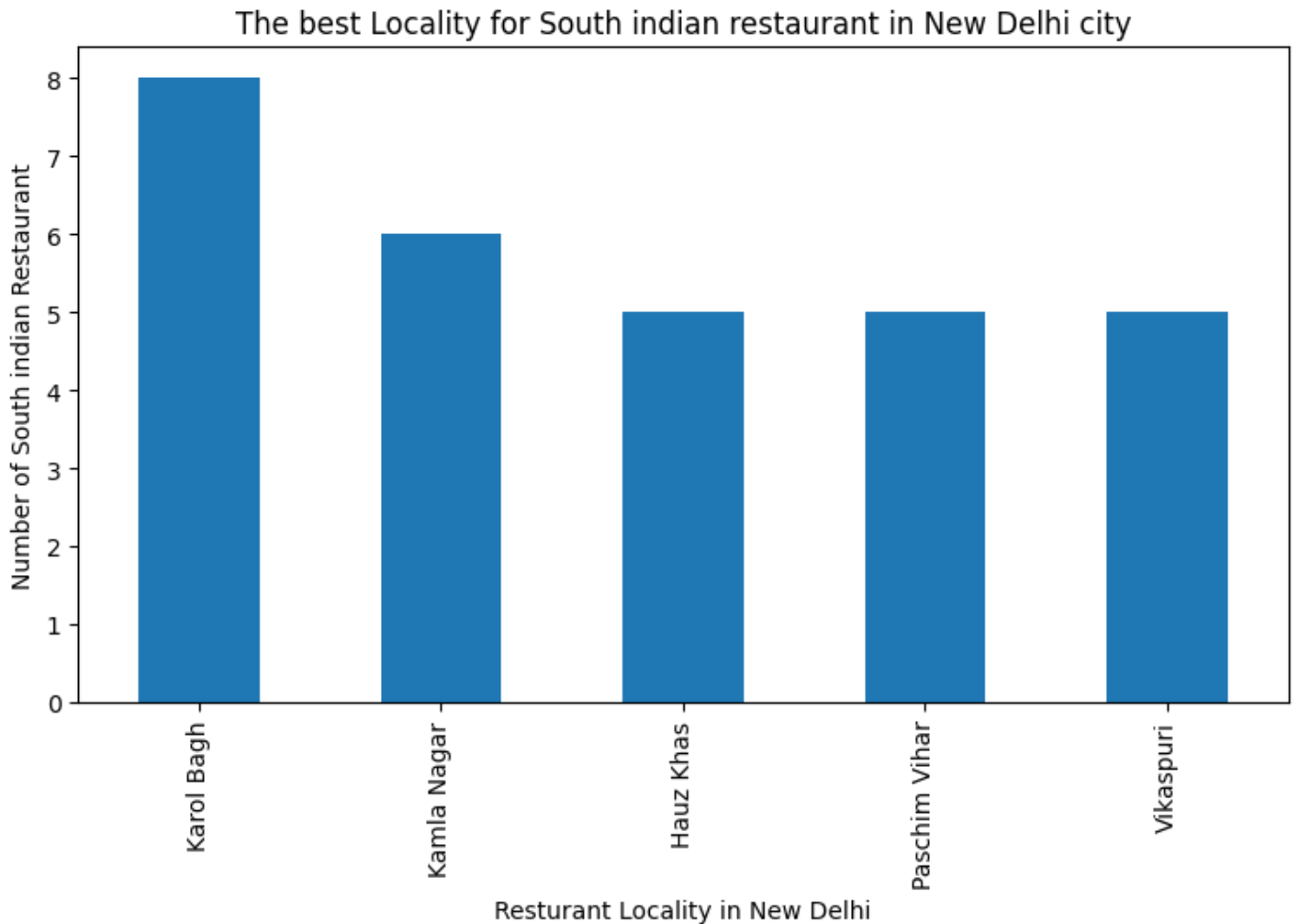
In [19]:

```
import matplotlib.pyplot as plt
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('The best Locality for South indian restaurant in New Delhi city')
#On x-axis

#giving a bar plot
df_new[df_new['Cuisines'].str.startswith('South')].groupby('Locality')['Restaurant Name']
].count().nlargest(5).plot(kind='bar')

plt.xlabel('Resturant Locality in New Delhi')
#On y-axis
plt.ylabel('Number of South indian Restaurant')

#displays the plot
plt.show()
```



**karol bagh have the highest number of South Indian resturant**

In [20]:

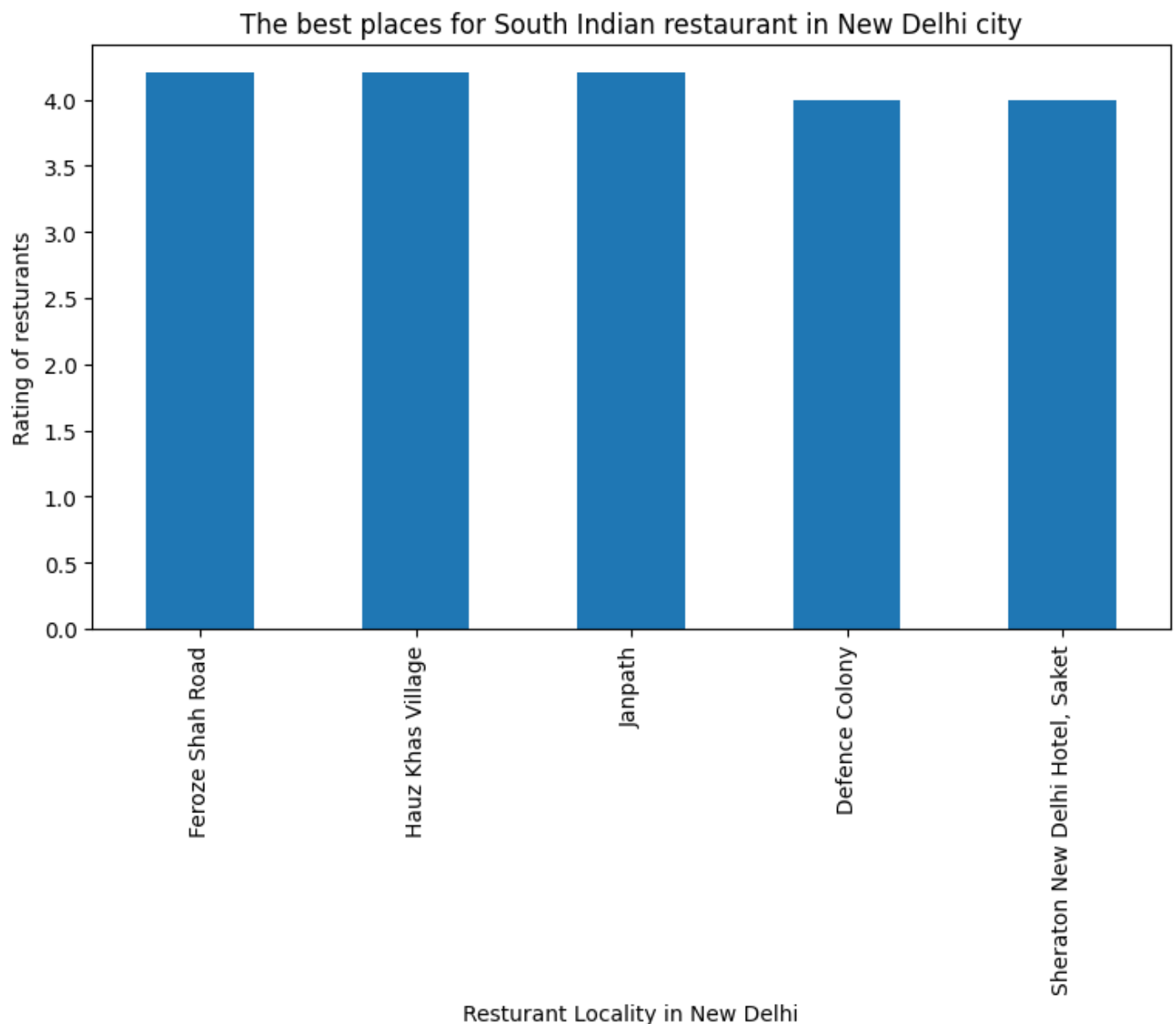
```
import matplotlib.pyplot as plt
plt.figure(figsize=(9,5), dpi = 100)
# title
plt.title('The best places for South Indian restaurant in New Delhi city')
#On x-axis

#giving a bar plot
df_new[df_new['Cuisines'].str.startswith('South')].groupby('Locality')['Aggregate rating']
].mean().nlargest(5).plot(kind='bar')

plt.xlabel('Resturant Locality in New Delhi')
#On y-axis
plt.ylabel('Rating of resturants')

#displays the plot
```

```
plt.show()
```



**Feroz Shah Road is the best place for the South Indian resturant follwed by Hauz Jhas Village and Janpath**

## Data transformation

**Based on Locality grouping the data**

In [21]:

```
df_Res_Loc = df_new.groupby('Locality').count()['Restaurant Name'].to_frame()
df_Res_rating= df_new.groupby('Locality')['Aggregate rating'].mean().to_frame()
d_Cuisines = df_new.groupby(['Locality'])['Cuisines'].agg(', '.join).reset_index()
d_R = df_new.groupby(['Locality'])['Rating text'].unique().agg(', '.join).reset_index()
d_V = df_new.groupby(['Locality'])['Votes'].sum().to_frame()
d_Lat = df_new.groupby('Locality').mean()['Latitude'].to_frame()
d_Lng = df_new.groupby('Locality').mean()['Longitude'].to_frame()
df_final = pd.merge(d_Lat,d_Lng,on='Locality').merge(df_Res_Loc, on='Locality').merge(d_Cuisines, on='Locality').merge(df_Res_rating,on ='Locality').merge(d_R, on ='Locality').merge(d_V, on ='Locality')
```

In [22]:

```
df_final = df_final[df_final['Aggregate rating'] != 0.000000]
df_final.columns=['Locality','Lat','Lng', 'No_of_Restaurant','Cusines', 'Agg_Rating','Comments', 'No_of_Votes']
df_final.head()
```

Out[22]:

Out [22]:

	Locality	Lat	Lng	No_of_Restaurant	Cusines	Agg_Rating	Comments	No_of_Votes
0	ARSS Mall, Paschim Vihar	28.668945	77.101544	1	North Indian, South Indian, Chinese, Mithai, F...	3.100000	Average	117
1	Adchini	28.537063	77.197808	13	Fast Food, North Indian, Seafood, Continental,...	3.292308	Average, Good, Poor, Very Good	1560
2	Aditya Mega Mall, Karkardooma	28.656131	77.301266	4	Finger Food, North Indian, Mughlai, Pizza, Fas...	3.275000	Average, Good	434
3	Aerocity	28.553077	77.104270	2	Fast Food, Italian, Pizza, North Indian, Conti...	3.200000	Average	59
4	Aggarwal City Mall, Pitampura	28.690020	77.134650	3	North Indian, Chinese, Street Food, Mithai, No...	3.033333	Average	126

In [23]:

```
df_final.shape
```

Out [23]:

(240, 8)

## Define Foursquare Credentials and Version

In [24]:

```
## Define Foursquare Credentials and Version
CLIENT_ID = 'E504ZK50AUW1NLSMERAQLZJFONHE13LFBY1EIDQ0WLAD0V2S' # Foursquare ID
CLIENT_SECRET = 'VJWVDT4S40HYLXHHHCDEPCE1FV3S4CW0MEVN4BOLV03ZRKLXY' # Foursquare Secret
VERSION = '20180605' # Foursquare API version

print('Your credentails:')
print('CLIENT_ID: ' + CLIENT_ID)
print('CLIENT_SECRET: ' + CLIENT_SECRET)
```

Your credentails:  
CLIENT\_ID: E504ZK50AUW1NLSMERAQLZJFONHE13LFBY1EIDQ0WLAD0V2S  
CLIENT\_SECRET: VJWVDT4S40HYLXHHHCDEPCE1FV3S4CW0MEVN4BOLV03ZRKLXY

In [25]:

```
## create a function to repeat the same process to all the Locality in New Delhi

def getNearbyVenues(names, latitudes, longitudes, radius=500, LIMIT = 100):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)

        # create the API request URL
        url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={}&{&radius={}&limit={}'.format(
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

        # make the GET request
        results = requests.get(url).json()["response"]['groups'][0]['items']
```

```

# return only relevant information for each nearby venue
venues_list.append([
    name,
    lat,
    lng,
    v['venue']['name'],
    v['venue']['location']['lat'],
    v['venue']['location']['lng'],
    v['venue']['categories'][0]['name']) for v in results])

nearby_venues = pd.DataFrame([item for venue_list in venues_list for item in venue_list])
nearby_venues.columns = ['Locality',
    'Locality Latitude',
    'Locality Longitude',
    'Venue',
    'Venue Latitude',
    'Venue Longitude',
    'Venue Category']

return(nearby_venues)

```

In [26]:

```

# find the venues in all New Delhi Locality
new_Delhi_venues = getNearbyVenues(names=df_final['Locality'],
    latitudes=df_final['Lat'],
    longitudes=df_final['Lng']
)

```

ARSS Mall, Paschim Vihar  
 Adchini  
 Aditya Mega Mall, Karkardooma  
 Aerocity  
 Aggarwal City Mall, Pitampura  
 Aggarwal City Plaza, Rohini  
 Alaknanda  
 Ambience Mall, Vasant Kunj  
 Anand Lok  
 Anand Vihar  
 Andaz Delhi, Aerocity  
 Ansal Plaza Mall, Khel Gaon Marg  
 Asaf Ali Road  
 Ashok Vihar Phase 1  
 Ashok Vihar Phase 2  
 Ashok Vihar Phase 3  
 Barakhamba Road  
 Basant Lok Market, Vasant Vihar  
 Bellagio, Ashok Vihar Phase 2  
 Best Western Taurus Hotel, Mahipalpur  
 Bhikaji Cama Place  
 Chanakyapuri  
 Chander Nagar  
 Chandni Chowk  
 Chawri Bazar  
 Chhatarpur  
 Chittaranjan Park  
 City Centre Mall, Rohini  
 City Square Mall, Rajouri Garden  
 Civil Lines  
 Community Centre, New Friends Colony  
 Connaught Place  
 Crescent Square Mall, Rohini  
 Cross River Mall, Karkardooma  
 Crowne Plaza Hotel, Rohini  
 Crowne Plaza, Mayur Vihar Phase 1  
 D Mall, Netaji Subhash Place  
 DDA Market, Kalu Sarai, Hauz Khas  
 DLF City Centre Mall, Shalimar Bagh  
 DLF Emporio Mall, Vasant Kunj  
 DLF Place Mall, Saket

DLF Promenade Mall, Vasant Kunj  
DLF South Square, Sarojini Nagar  
Daryaganj  
Defence Colony  
Delhi University-GTB Nagar  
Dilli Haat, INA  
Dilshad Garden  
District Centre, Janakpuri  
Dr. Zakir Hussain Marg  
East Patel Nagar  
East of Kailash  
Epicuria Food Mall, Nehru Place  
Eros Hotel, Nehru Place  
Essex Farms  
Feroze Shah Road  
Friends Colony  
GTB Nagar  
Garden of Five Senses, Saket  
Geeta Colony  
Ginger Hotel, Vivek Vihar  
Gourmet Hub, Pashim Vihar  
Greater Kailash (GK) 1  
Greater Kailash (GK) 2  
Greater Kailash (GK) 3  
Green Park  
Gujranwala Town  
Hauz Khas  
Hauz Khas Village  
Holiday Inn, Aerocity  
Holiday Inn, Mayur Vihar  
Hotel Broadway, Daryaganj  
Hotel City Park, Pitampura  
Hotel Regent Grand, Karol Bagh  
Hotel The Royal Plaza, Janpath  
Hyatt Regency, Bhikaji Cama Place  
INA  
IP Extension  
ITC Maurya, Chanakyapuri  
ITO  
India Gate  
JMD Kohinoor Mall, Greater Kailash  
JNU  
JW Marriott New Delhi  
Jail Road  
Jama Masjid  
Janakpuri  
Jangpura  
Janpath  
Jasola  
Jaypee Siddharth, Rajendra Place  
Jaypee Vasant Continental, Vasant Vihar  
Jor Bagh  
Kailash Colony  
Kalkaji  
Kamla Nagar  
Kapashera  
Karampura  
Karkardooma  
Karol Bagh  
Kasbah, Greater Kailash (GK) 1  
Kashmiri Gate  
Khan Market  
Kirti Nagar  
Krishna Nagar  
Lado Sarai  
Lajpat Nagar 1  
Lajpat Nagar 2  
Lajpat Nagar 4  
Lawrence Road  
Laxmi Nagar  
Le Meridien, Janpath  
Lemon Tree Premier, Aerocity

Living Style Mall, Jasola  
Lodhi Colony  
Lodhi Road  
MG Road  
MGF Metropolitan Mall, Saket  
MGM Club, Daryaganj  
Mahipalpur  
Maidens Hotel, Civil Lines  
Majnu ka Tila  
Malviya Nagar  
Mandi House  
Mathura Road  
Mayapuri Phase 2  
Mayur Vihar Phase 1  
Mayur Vihar Phase 2  
Mayur Vihar Phase 3  
Mehrauli  
Metro Walk Mall, Rohini  
Model Town 1  
Model Town 2  
Model Town 3  
Moments Mall, Kirti Nagar  
Moti Bagh  
Moti Nagar  
Mukherjee Nagar  
Munirka  
Najafgarh  
Naraina  
Nehru Place  
Netaji Subhash Place  
New Friends Colony  
Nizamuddin  
Okhla Phase 1  
Okhla Phase 2  
PVR Anupam Complex  
Pacific Mall, Tagore Garden  
Paharganj  
Palam  
Palate of Delhi, Chanakyapuri  
Panchsheel Park  
Pandara Road Market  
Pandav Nagar  
Paschim Vihar  
Patparganj  
Piccadily Hotel, Janakpuri  
Pitampura  
Pragati Maidan  
Prashant Vihar  
Preet Vihar  
Premier Inn, Shalimar Bagh  
Pride Plaza Hotel, Aerocity  
Punjabi Bagh  
Qutab Institutional Area  
R K Puram  
Race Course  
Radisson Blu Plaza Delhi, Mahipalpur  
Radisson Blu, Paschim Vihar  
Rajendra Place  
Rajinder Nagar  
Rajouri Garden  
Rohini  
Roseate House, Aerocity  
SDA  
Safdarjung  
Sainik Farms  
Saket  
Sangam Courtyard, RK Puram  
Sarita Vihar  
Sarojini Nagar  
Satyaniketan  
Sector 15, Dwarka  
Select Citywalk Mall, Saket

Shahdara  
Shahpur Jat  
Shakarpur  
Shalimar Bagh  
Shangri La's - Eros hotel, Janpath  
Shanti Niketan Marg  
Sheikh Sarai  
Sheraton New Delhi Hotel, Saket  
South Extension 1  
South Extension 2  
Southern Park Mall, Saket  
Spark Mall, Kamla Nagar  
Star City Mall, Mayur Vihar Phase 1  
Subhash Nagar  
Sunder Nagar  
T3 Domestic Arrival, Aerocity  
TDI Mall, Rajouri Garden  
Tagore Garden  
Taj Vivanta, Khan Market  
The Ashok, Chanakyapuri  
The Claridges, Aurangzeb Road  
The Grand New Delhi, Vasant Kunj  
The Imperial, Janpath  
The India Mall, New Friends Colony  
The Lalit New Delhi, Barakhamba Road  
The Leela Ambience Convention Hotel  
The Leela Palace, Chanakyapuri  
The Lodhi, Lodhi Road  
The Park, Connaught Place  
The Suryaa New Delhi, New Friends Colony  
The Taj Mahal Hotel, Mansingh Road  
The Taj Palace Hotel, Chanakyapuri  
The Uppal, Aerocity  
The Village Restaurant Complex, Khel Gaon Marg  
Tilak Nagar  
Tughlakabad Institutional Area  
Uday Park  
Unity One Mall, Janakpuri  
Uttam Nagar  
V3S Mall, Laxmi Nagar  
Vasant Kunj  
Vasant Square Mall, Vasant Kunj  
Vasant Vihar  
Vasundhara Enclave  
Vijay Nagar  
Vikas Marg  
Vikasपुरी  
Vivek Vihar  
Wazirpur  
West End Mall, Janak Puri  
West Gate Mall, Rajouri Garden  
West Patel Nagar  
Worldmark 1, Aerocity  
Yusuf Sarai  
ibis New Delhi, Aerocity

In [27]:

```
new_Delhi_venues.head()
```

Out[27]:

	Locality	Locality Latitude	Locality Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	ARSS Mall, Paschim Vihar	28.668945	77.101544	Subway	28.669999	77.102546	Sandwich Place
1	ARSS Mall, Paschim Vihar	28.668945	77.101544	Pizza Hut	28.670321	77.103853	Pizza Place
2	ARSS Mall, Paschim Vihar	28.668945	77.101544	Café Coffee Day	28.670009	77.102480	Coffee Shop



3	ARSS Mall, Paschim Vihar	28.668945	77.101544	Baljeet's Amusements Koolcha	28.665700	77.101044	Chinese Restaurant
4	ARSS Mall, Paschim Vihar	28.668945	77.101544	Little Chef	28.670000	77.101459	Chinese Restaurant

In [28]:

```
new_Delhi_venues.groupby('Locality').count()
```

Out[28]:

	Locality Latitude	Locality Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Locality						
ARSS Mall, Paschim Vihar	9	9	9	9	9	9
Adchini	6	6	6	6	6	6
Aditya Mega Mall, Karkardooma	10	10	10	10	10	10
Aerocity	7	7	7	7	7	7
Aggarwal City Mall, Pitampura	4	4	4	4	4	4
...	...	...	...	...	...	...
West Gate Mall, Rajouri Garden	16	16	16	16	16	16
West Patel Nagar	4	4	4	4	4	4
Worldmark 1, Aerocity	27	27	27	27	27	27
Yusuf Sarai	12	12	12	12	12	12
ibis New Delhi, Aerocity	25	25	25	25	25	25

238 rows x 6 columns

In [29]:

```
print('There are {} uniques categories.'.format(len(new_Delhi_venues['Venue Category'].unique())))
```

There are 209 uniques categories.

In [30]:

```
## Analyze Each Locality

# one hot encoding
new_Delhi_onehot = pd.get_dummies(new_Delhi_venues[['Venue Category']], prefix="", prefix_sep="")

# add Locality column back to dataframe
new_Delhi_onehot['Locality'] = new_Delhi_venues['Locality']

# move Locality column to the first column
column_list = new_Delhi_onehot.columns.tolist()
column_number = int(column_list.index('Locality'))
column_list = [column_list[column_number]] + column_list[:column_number] + column_list[column_number+1:]
new_Delhi_onehot = new_Delhi_onehot[column_list]

new_Delhi_onehot.head()
```

Out[30]:

Locality	ATM	Accessories Store	Afghan Restaurant	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Arcade	Art Gallery	Mus
----------	-----	-------------------	-------------------	--------------------	--------------------	----------------	-----------------	------------------	---------------------	--------	-------------	-----

	ARSS Mall, Paschim Vihar	ATM	Accessories Store	Afghan Restaurant	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Arcade	Art Gallery	Mus
0													
1	ARSS Mall, Paschim Vihar	0	0	0	0	0	0	0	0	0	0	0	
2	ARSS Mall, Paschim Vihar	0	0	0	0	0	0	0	0	0	0	0	
3	ARSS Mall, Paschim Vihar	0	0	0	0	0	0	0	0	0	0	0	
4	ARSS Mall, Paschim Vihar	0	0	0	0	0	0	0	0	0	0	0	

5 rows x 210 columns



In [31]:

```
New_Delhi_grouped = new_Delhi_onehot.groupby('Locality').mean().reset_index()
New_Delhi_grouped
```

Out[31]:

	Locality	ATM	Accessories Store	Afghan Restaurant	African Restaurant	Airport Food Court	Airport Lounge	Airport Service	Airport Terminal	American Restaurant	Arcade
0	ARSS Mall, Paschim Vihar	0.111111	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
1	Adchini	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
2	Aditya Mega Mall, Karkardooma	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
3	Aerocity	0.000000	0.000000	0.0	0.0	0.0	0.142857	0.0	0.142857	0.0000	0.0
4	Aggarwal City Mall, Pitampura	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
...	...	...	...	...	...	...	...	...	...	...	...
233	West Gate Mall, Rajouri Garden	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0625	0.0
234	West Patel Nagar	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
235	Worldmark 1, Aerocity	0.000000	0.037037	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
236	Yusuf Sarai	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0
237	ibis New Delhi, Aerocity	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.000000	0.0000	0.0

238 rows x 210 columns



In [32]:

```
New_Delhi_grouped.shape
```

```
Out[32]:
```

```
(238, 210)
```

```
In [33]:
```

```
## print each Locality along with the top 5 most common venues
```

```
num_top_venues = 5
```

```
for hood in New_Delhi_grouped['Locality']:
    print("----"+hood+"----")
    temp = New_Delhi_grouped[New_Delhi_grouped['Locality'] == hood].T.reset_index()
    temp.columns = ['venue', 'freq']
    temp = temp.iloc[1:]
    temp['freq'] = temp['freq'].astype(float)
    temp = temp.round({'freq': 2})
    print(temp.sort_values('freq', ascending=False).reset_index(drop=True).head(num_top_venues))
    print('\n')
```

```
----ARSS Mall, Paschim Vihar----
```

	venue	freq
0	Indian Restaurant	0.22
1	ATM	0.11
2	Chinese Restaurant	0.11
3	Multicuisine Indian Restaurant	0.11
4	Market	0.11

```
----Adchini----
```

	venue	freq
0	Indian Restaurant	0.33
1	Café	0.33
2	Pub	0.17
3	Restaurant	0.17
4	ATM	0.00

```
----Aditya Mega Mall, Karkardooma----
```

	venue	freq
0	Multiplex	0.2
1	Pizza Place	0.2
2	Shopping Mall	0.2
3	Indian Restaurant	0.2
4	Hotel	0.1

```
----Aerocity----
```

	venue	freq
0	Hotel	0.29
1	Rental Car Location	0.14
2	Airport Lounge	0.14
3	Coffee Shop	0.14
4	Airport Terminal	0.14

```
----Aggarwal City Mall, Pitampura----
```

	venue	freq
0	Multiplex	0.25
1	Department Store	0.25
2	Indian Restaurant	0.25
3	Café	0.25
4	Office	0.00

```
----Aggarwal City Plaza, Rohini----
```

	venue	freq
0	Fast Food Restaurant	0.25
1	Sandwich Place	0.12

2	Pizza Place	0.12
3	Electronics Store	0.12
4	Gym / Fitness Center	0.12

----Alaknanda----

	venue	freq
0	Chinese Restaurant	0.33
1	Market	0.17
2	Coffee Shop	0.17
3	Hotel	0.17
4	Food & Drink Shop	0.17

----Ambience Mall, Vasant Kunj----

	venue	freq
0	Coffee Shop	0.09
1	Italian Restaurant	0.07
2	Fast Food Restaurant	0.07
3	Café	0.07
4	Asian Restaurant	0.07

----Anand Lok----

	venue	freq
0	Stadium	0.18
1	Café	0.18
2	Dessert Shop	0.09
3	Coffee Shop	0.09
4	Music Venue	0.09

----Anand Vihar----

	venue	freq
0	Café	0.50
1	Burger Joint	0.25
2	Burrito Place	0.25
3	ATM	0.00
4	Northeast Indian Restaurant	0.00

----Andaz Delhi, Aerocity----

	venue	freq
0	Hotel	0.39
1	Coffee Shop	0.09
2	Indian Restaurant	0.09
3	Multicuisine Indian Restaurant	0.04
4	Mughlai Restaurant	0.04

----Ansal Plaza Mall, Khel Gaon Marg----

	venue	freq
0	Japanese Restaurant	0.25
1	Karaoke Bar	0.25
2	Shopping Mall	0.25
3	Fast Food Restaurant	0.25
4	Northeast Indian Restaurant	0.00

----Asaf Ali Road----

	venue	freq
0	Hostel	0.29
1	Hotel	0.29
2	Indian Restaurant	0.14
3	Campground	0.14
4	Movie Theater	0.14

----Ashok Vihar Phase 1----

	venue	freq
0	Dessert Shop	0.14
1	Snack Place	0.14

2	Pizza Place	0.14
3	Smoke Shop	0.14
4	Indian Restaurant	0.14

----Ashok Vihar Phase 2----

	venue	freq
0	South Indian Restaurant	0.17
1	Indian Restaurant	0.17
2	Asian Restaurant	0.17
3	Coffee Shop	0.17
4	Sandwich Place	0.17

----Ashok Vihar Phase 3----

	venue	freq
0	Pizza Place	0.2
1	Garden	0.2
2	Gym / Fitness Center	0.2
3	Fast Food Restaurant	0.2
4	South Indian Restaurant	0.2

----Barakhamba Road----

	venue	freq
0	Theater	0.15
1	Bakery	0.15
2	Indian Restaurant	0.15
3	Café	0.15
4	Hotel Bar	0.08

----Basant Lok Market, Vasant Vihar----

	venue	freq
0	Café	0.15
1	Pizza Place	0.08
2	Fast Food Restaurant	0.08
3	Restaurant	0.08
4	Coffee Shop	0.08

----Bellagio, Ashok Vihar Phase 2----

	venue	freq
0	South Indian Restaurant	0.17
1	Indian Restaurant	0.17
2	Asian Restaurant	0.17
3	Coffee Shop	0.17
4	Sandwich Place	0.17

----Best Western Taurus Hotel, Mahipalpur----

	venue	freq
0	Hotel	0.22
1	Buffet	0.11
2	Indian Restaurant	0.11
3	Hotel Bar	0.11
4	Bed & Breakfast	0.11

----Bhikaji Cama Place----

	venue	freq
0	Hotel	0.17
1	Lounge	0.17
2	Asian Restaurant	0.08
3	Gym / Fitness Center	0.08
4	Nightclub	0.08

----Chanakyapuri----

	venue	freq
0	African Restaurant	0.25
1	Park	0.25

2	Trail	0.25
3	Café	0.25
4	ATM	0.00

----Chander Nagar----

	venue	freq
0	Pizza Place	0.33
1	Gym	0.33
2	Fast Food Restaurant	0.33
3	ATM	0.00
4	Northeast Indian Restaurant	0.00

----Chandni Chowk----

	venue	freq
0	Indian Restaurant	0.32
1	Snack Place	0.16
2	Market	0.11
3	Dessert Shop	0.11
4	Restaurant	0.05

----Chawri Bazar----

	venue	freq
0	Snack Place	0.14
1	Mosque	0.14
2	Indian Restaurant	0.14
3	Light Rail Station	0.14
4	Paper / Office Supplies Store	0.14

----Chhatarpur----

	venue	freq
0	Donut Shop	0.2
1	Japanese Restaurant	0.2
2	Indian Restaurant	0.2
3	Light Rail Station	0.2
4	Hotel	0.2

----Chittaranjan Park----

	venue	freq
0	Market	0.4
1	Indian Restaurant	0.2
2	Park	0.2
3	Chinese Restaurant	0.2
4	ATM	0.0

----City Centre Mall, Rohini----

	venue	freq
0	Department Store	0.33
1	Shopping Mall	0.17
2	Indian Restaurant	0.17
3	Fast Food Restaurant	0.17
4	Café	0.17

----City Square Mall, Rajouri Garden----

	venue	freq
0	Indian Restaurant	0.17
1	Café	0.17
2	Fast Food Restaurant	0.17
3	Pizza Place	0.08
4	Diner	0.04

----Civil Lines----

	venue	freq
0	Chinese Restaurant	0.2
1	Smoke Shop	0.2

2	Burger Joint	0.2
3	Light Rail Station	0.2
4	Coffee Shop	0.2

----Community Centre, New Friends Colony----

	venue	freq
0	Café	0.15
1	Indian Restaurant	0.10
2	Diner	0.05
3	Thai Restaurant	0.05
4	Pizza Place	0.05

----Connaught Place----

	venue	freq
0	Indian Restaurant	0.17
1	Café	0.09
2	Chinese Restaurant	0.08
3	Bar	0.08
4	Coffee Shop	0.06

----Crescent Square Mall, Rohini----

	venue	freq
0	Pub	0.2
1	Pharmacy	0.2
2	Gym	0.2
3	Clothing Store	0.2
4	Food Court	0.2

----Cross River Mall, Karkardooma----

	venue	freq
0	Indian Restaurant	0.4
1	Pizza Place	0.2
2	Multiplex	0.2
3	Hotel	0.2
4	ATM	0.0

----Crowne Plaza Hotel, Rohini----

	venue	freq
0	Theme Park	0.14
1	Light Rail Station	0.14
2	Asian Restaurant	0.14
3	Hotel	0.14
4	Fast Food Restaurant	0.14

----Crowne Plaza, Mayur Vihar Phase 1----

	venue	freq
0	Hotel	0.38
1	Indian Restaurant	0.08
2	Asian Restaurant	0.08
3	Department Store	0.08
4	Pizza Place	0.08

----D Mall, Netaji Subhash Place----

	venue	freq
0	Indian Restaurant	0.21
1	Fast Food Restaurant	0.14
2	Coffee Shop	0.14
3	Shopping Mall	0.07
4	Multiplex	0.07

----DDA Market, Kalu Sarai, Hauz Khas----

	venue	freq
0	Metro Station	0.2
1	Nightclub	0.2

1                    Bhagat Singh 0.2  
2           Event Space   0.2  
3           Coffee Shop   0.2  
4   Chinese Restaurant   0.2

----DLF City Centre Mall, Shalimar Bagh----

	venue	freq
0	ATM	0.17
1	Multiplex	0.17
2	Convenience Store	0.17
3	Vegetarian / Vegan Restaurant	0.17
4	Shopping Mall	0.17

----DLF Emporio Mall, Vasant Kunj----

	venue	freq
0	Coffee Shop	0.09
1	Italian Restaurant	0.07
2	Fast Food Restaurant	0.07
3	Café	0.07
4	Asian Restaurant	0.07

----DLF Place Mall, Saket----

	venue	freq
0	Indian Restaurant	0.14
1	Lounge	0.07
2	Bar	0.07
3	Clothing Store	0.07
4	Chinese Restaurant	0.05

----DLF Promenade Mall, Vasant Kunj----

	venue	freq
0	Coffee Shop	0.09
1	Italian Restaurant	0.07
2	Fast Food Restaurant	0.07
3	Café	0.07
4	Asian Restaurant	0.07

----DLF South Square, Sarojini Nagar----

	venue	freq
0	Indian Restaurant	0.33
1	Fast Food Restaurant	0.17
2	Women's Store	0.08
3	Shopping Mall	0.08
4	Market	0.08

----Daryaganj----

	venue	freq
0	Indian Restaurant	0.31
1	Restaurant	0.15
2	Hostel	0.15
3	Hotel	0.15
4	Movie Theater	0.08

----Defence Colony----

	venue	freq
0	Italian Restaurant	0.18
1	Indian Restaurant	0.18
2	Bakery	0.12
3	South Indian Restaurant	0.06
4	Restaurant	0.06

----Delhi University-GTB Nagar----

	venue	freq
0	Café	0.25
1	Snack Place	0.08



1	Snack Place	0.08
2	Light Rail Station	0.08
3	North Indian Restaurant	0.08
4	Coffee Shop	0.08

----Dilli Haat, INA----

	venue	freq
0	Northeast Indian Restaurant	0.2
1	Indian Restaurant	0.2
2	Train Station	0.2
3	Restaurant	0.2
4	Market	0.2

----Dilshad Garden----

	venue	freq
0	Dry Cleaner	0.2
1	Indian Restaurant	0.2
2	Market	0.2
3	Bank	0.2
4	Health & Beauty Service	0.2

----District Centre, Janakpuri----

	venue	freq
0	Indian Restaurant	0.15
1	Restaurant	0.08
2	Fast Food Restaurant	0.08
3	Sandwich Place	0.08
4	BBQ Joint	0.08

----Dr. Zakir Hussain Marg----

	venue	freq
0	Indian Restaurant	0.25
1	Golf Course	0.17
2	Italian Restaurant	0.17
3	Convenience Store	0.08
4	Gaming Cafe	0.08

----East Patel Nagar----

	venue	freq
0	Hotel	0.15
1	Pizza Place	0.15
2	Coffee Shop	0.08
3	Chinese Restaurant	0.08
4	Bar	0.08

----East of Kailash----

	venue	freq
0	Hot Dog Joint	0.12
1	Vegetarian / Vegan Restaurant	0.12
2	Hotel	0.12
3	Coffee Shop	0.12
4	Fast Food Restaurant	0.12

----Epicuria Food Mall, Nehru Place----

	venue	freq
0	Fast Food Restaurant	0.07
1	Chinese Restaurant	0.07
2	Coffee Shop	0.07
3	Sandwich Place	0.03
4	Bengali Restaurant	0.03

----Eros Hotel, Nehru Place----

	venue	freq
0	Fast Food Restaurant	0.11
1	Coffee Shop	0.07

1	Coffee Shop	0.04
2	Plaza	0.04
3	Food Court	0.04
4	Bengali Restaurant	0.04

----Essex Farms----

	venue	freq
0	Metro Station	0.25
1	Nightclub	0.25
2	Coffee Shop	0.25
3	Event Space	0.25
4	Other Great Outdoors	0.00

----Feroze Shah Road----

	venue	freq
0	Indian Restaurant	1.0
1	ATM	0.0
2	Northeast Indian Restaurant	0.0
3	Multicuisine Indian Restaurant	0.0
4	Multiplex	0.0

----Friends Colony----

	venue	freq
0	Hotel	0.33
1	Gym	0.17
2	Neighborhood	0.17
3	Café	0.17
4	Sculpture Garden	0.17

----GTB Nagar----

	venue	freq
0	Pizza Place	0.33
1	Juice Bar	0.33
2	Food Truck	0.33
3	ATM	0.00
4	Northeast Indian Restaurant	0.00

----Garden of Five Senses, Saket----

	venue	freq
0	Pub	0.14
1	Italian Restaurant	0.14
2	Garden	0.14
3	Restaurant	0.14
4	Coffee Shop	0.14

----Geeta Colony----

	venue	freq
0	Indian Restaurant	0.5
1	Burger Joint	0.5
2	ATM	0.0
3	Office	0.0
4	Multiplex	0.0

----Ginger Hotel, Vivek Vihar----

	venue	freq
0	Hotel	0.33
1	Indian Restaurant	0.17
2	Café	0.17
3	Asian Restaurant	0.17
4	BBQ Joint	0.17

----Gourmet Hub, Pashim Vihar----

	venue	freq
0	Food & Drink Shop	0.17
1	Pizza Place	0.17

```
1      0.17
2 Indian Restaurant 0.17
3   Ice Cream Shop 0.17
4       Bakery 0.17
```

----Greater Kailash (GK) 1----

```
venue freq
0 Indian Restaurant 0.09
1      Café 0.09
2      Market 0.09
3   Donut Shop 0.05
4      Bistro 0.05
```

----Greater Kailash (GK) 2----

```
venue freq
0      Café 0.10
1   Restaurant 0.10
2 Asian Restaurant 0.10
3 Chinese Restaurant 0.08
4 Indian Restaurant 0.08
```

----Greater Kailash (GK) 3----

```
venue freq
0      Café 0.14
1   Restaurant 0.14
2   Food Court 0.07
3 Sandwich Place 0.07
4   BBQ Joint 0.07
```

----Green Park----

```
venue freq
0 Indian Restaurant 0.19
1   Coffee Shop 0.15
2   Donut Shop 0.08
3   Pizza Place 0.08
4      Bar 0.04
```

----Gujranwala Town----

```
venue freq
0   Snack Place 0.2
1   Smoke Shop 0.2
2 Shopping Mall 0.2
3      Gym 0.2
4 Shipping Store 0.2
```

----Hauz Khas----

```
venue freq
0   Coffee Shop 0.15
1 Indian Restaurant 0.10
2   Dessert Shop 0.10
3   Karaoke Bar 0.05
4      Bar 0.05
```

----Hauz Khas Village----

```
venue freq
0      Café 0.14
1 Indian Restaurant 0.10
2   Restaurant 0.08
3      Bar 0.06
4 Italian Restaurant 0.06
```

----Holiday Inn, Aerocity----

```
venue freq
0   Hotel 0.33
1 Red & Breakfast 0.07
```

1	Coffee Shop	0.07
2	Coffee Shop	0.07
3	Indian Restaurant	0.07
4	Train Station	0.04

----Holiday Inn, Mayur Vihar----

	venue	freq
0	Hotel	0.29
1	Restaurant	0.12
2	Indian Restaurant	0.06
3	Bakery	0.06
4	Pizza Place	0.06

----Hotel Broadway, Daryaganj----

	venue	freq
0	Hostel	0.22
1	Indian Restaurant	0.22
2	Hotel	0.22
3	Road	0.11
4	Movie Theater	0.11

----Hotel City Park, Pitampura----

	venue	freq
0	Garden	0.2
1	Coffee Shop	0.2
2	Park	0.2
3	Bakery	0.2
4	Hotel	0.2

----Hotel Regent Grand, Karol Bagh----

	venue	freq
0	Pizza Place	0.17
1	Hotel	0.17
2	Donut Shop	0.08
3	Metro Station	0.08
4	Spa	0.08

----Hotel The Royal Plaza, Janpath----

	venue	freq
0	Hotel	0.16
1	Indian Restaurant	0.12
2	Spa	0.09
3	Chinese Restaurant	0.06
4	Restaurant	0.06

----Hyatt Regency, Bhikaji Cama Place----

	venue	freq
0	Lounge	0.18
1	Hotel	0.09
2	Asian Restaurant	0.09
3	Gym / Fitness Center	0.09
4	Nightclub	0.09

----INA----

	venue	freq
0	Northeast Indian Restaurant	0.25
1	Indian Restaurant	0.25
2	Train Station	0.25
3	Market	0.25
4	ATM	0.00

----IP Extension----

	venue	freq
0	Indian Restaurant	0.2
1	Dessert Shop	0.1

	venue	freq
2	Shopping Mall	0.1
3	Shop & Service	0.1
4	Café	0.1

----ITC Maurya, Chanakyapuri----

	venue	freq
0	Hotel	0.12
1	Indian Restaurant	0.12
2	Café	0.09
3	Chinese Restaurant	0.06
4	Hotel Pool	0.03

----ITO----

	venue	freq
0	Plaza	0.12
1	Udupi Restaurant	0.12
2	Historic Site	0.12
3	Café	0.12
4	Art Museum	0.12

----India Gate----

	venue	freq
0	ATM	0.25
1	Government Building	0.25
2	Music Venue	0.25
3	National Park	0.25
4	Moving Target	0.00

----JMD Kohinoor Mall, Greater Kailash----

	venue	freq
0	Café	0.17
1	Restaurant	0.13
2	Pizza Place	0.09
3	Chinese Restaurant	0.09
4	Ice Cream Shop	0.09

----JNU----

	venue	freq
0	Clothing Store	0.2
1	Airport Food Court	0.2
2	Shopping Mall	0.2
3	Indian Restaurant	0.2
4	Café	0.2

----JW Marriott New Delhi----

	venue	freq
0	Hotel	0.36
1	Coffee Shop	0.08
2	Indian Restaurant	0.08
3	Restaurant	0.04
4	Punjabi Restaurant	0.04

----Jail Road----

	venue	freq
0	Indian Restaurant	0.25
1	Pizza Place	0.12
2	Indian Sweet Shop	0.12
3	Ice Cream Shop	0.12
4	Fried Chicken Joint	0.12

----Jama Masjid----

	venue	freq
0	Indian Restaurant	0.38
1	Metro Station	0.12

2	Snack Place	0.12
3	Mosque	0.12
4	Frozen Yogurt Shop	0.12

----Janakpuri----

	venue	freq
0	Café	0.4
1	Gym	0.2
2	Park	0.2
3	Bakery	0.2
4	ATM	0.0

----Jangpura----

	venue	freq
0	Sandwich Place	0.29
1	Chinese Restaurant	0.14
2	Snack Place	0.14
3	Fast Food Restaurant	0.14
4	Food	0.14

----Janpath----

	venue	freq
0	Indian Restaurant	0.16
1	Coffee Shop	0.08
2	Italian Restaurant	0.08
3	Lounge	0.05
4	Fast Food Restaurant	0.05

----Jasola----

	venue	freq
0	Sandwich Place	0.2
1	Café	0.2
2	Soccer Field	0.2
3	Soccer Stadium	0.2
4	Pizza Place	0.2

----Jaypee Siddharth, Rajendra Place----

	venue	freq
0	Fast Food Restaurant	0.19
1	Hotel	0.12
2	Pizza Place	0.12
3	Multicuisine Indian Restaurant	0.06
4	Coffee Shop	0.06

----Jaypee Vasant Continental, Vasant Vihar----

	venue	freq
0	Café	0.15
1	Pizza Place	0.08
2	Fast Food Restaurant	0.08
3	Restaurant	0.08
4	Coffee Shop	0.08

----Jor Bagh----

	venue	freq
0	Metro Station	0.25
1	Record Shop	0.25
2	Indian Restaurant	0.25
3	Bakery	0.25
4	Office	0.00

----Kailash Colony----

	venue	freq
0	Bar	0.14
1	Department Store	0.14

1	Department Store	0.11
2	Electronics Store	0.07
3	Dessert Shop	0.07
4	Flea Market	0.07

----Kalkaji----

	venue	freq
0	Market	0.22
1	Fast Food Restaurant	0.22
2	Dessert Shop	0.11
3	Pizza Place	0.11
4	Indian Restaurant	0.11

----Kamla Nagar----

	venue	freq
0	Fast Food Restaurant	0.17
1	Breakfast Spot	0.17
2	Dumpling Restaurant	0.11
3	Chinese Restaurant	0.11
4	Coffee Shop	0.11

----Kapashera----

	venue	freq
0	Convenience Store	0.25
1	Supermarket	0.25
2	Food Truck	0.25
3	Food Court	0.25
4	ATM	0.00

----Karampura----

	venue	freq
0	Moving Target	0.25
1	Vegetarian / Vegan Restaurant	0.25
2	Indian Restaurant	0.25
3	Fried Chicken Joint	0.25
4	Northeast Indian Restaurant	0.00

----Karkardooma----

	venue	freq
0	Pizza Place	0.25
1	Indian Restaurant	0.25
2	Light Rail Station	0.25
3	Food Truck	0.25
4	ATM	0.00

----Karol Bagh----

	venue	freq
0	Indian Restaurant	0.24
1	Fast Food Restaurant	0.18
2	Hotel	0.06
3	Restaurant	0.06
4	Snack Place	0.06

----Kasbah, Greater Kailash (GK) 1----

	venue	freq
0	Café	0.22
1	Indian Restaurant	0.17
2	Market	0.06
3	Chinese Restaurant	0.06
4	Gym / Fitness Center	0.06

----Kashmiri Gate----

	venue	freq
0	Pizza Place	0.17
1	American Restaurant	0.17

2	Bus Station	0.17
3	Fast Food Restaurant	0.17
4	Historic Site	0.17

----Khan Market----

	venue	freq
0	Café	0.17
1	Coffee Shop	0.09
2	Chinese Restaurant	0.07
3	Bar	0.07
4	Indian Restaurant	0.04

----Kirti Nagar----

	venue	freq
0	ATM	0.2
1	Pizza Place	0.2
2	Convenience Store	0.2
3	Bank	0.2
4	Fish & Chips Shop	0.2

----Krishna Nagar----

	venue	freq
0	Pizza Place	0.50
1	Park	0.25
2	Fast Food Restaurant	0.25
3	ATM	0.00
4	North Indian Restaurant	0.00

----Lado Sarai----

	venue	freq
0	Shopping Mall	0.33
1	Golf Course	0.17
2	Furniture / Home Store	0.17
3	BBQ Joint	0.17
4	Nightclub	0.17

----Lajpat Nagar 1----

	venue	freq
0	Cocktail Bar	0.12
1	Indian Restaurant	0.12
2	Flea Market	0.12
3	Neighborhood	0.12
4	Coffee Shop	0.12

----Lajpat Nagar 2----

	venue	freq
0	Pizza Place	0.13
1	Coffee Shop	0.09
2	Fast Food Restaurant	0.09
3	Café	0.09
4	Convenience Store	0.09

----Lajpat Nagar 4----

	venue	freq
0	Indian Restaurant	0.18
1	Café	0.18
2	Market	0.18
3	Indie Movie Theater	0.09
4	Hotel	0.09

----Lawrence Road----

	venue	freq
0	Gastropub	0.17
1	Department Store	0.17



	venue	freq
2	Pharmacy	0.17
3	Light Rail Station	0.17
4	Basketball Court	0.17

----Laxmi Nagar----

	venue	freq
0	Pizza Place	0.25
1	Gym	0.25
2	Arcade	0.25
3	Gift Shop	0.25
4	ATM	0.00

----Le Meridien, Janpath----

	venue	freq
0	Hotel	0.33
1	Indian Restaurant	0.11
2	Restaurant	0.11
3	Nightclub	0.06
4	Cocktail Bar	0.06

----Lemon Tree Premier, Aerocity----

	venue	freq
0	Hotel	0.36
1	Coffee Shop	0.08
2	Indian Restaurant	0.08
3	Restaurant	0.04
4	Punjabi Restaurant	0.04

----Living Style Mall, Jasola----

	venue	freq
0	Indian Restaurant	0.33
1	Soccer Stadium	0.17
2	Pizza Place	0.17
3	Fast Food Restaurant	0.17
4	Bakery	0.17

----Lodhi Colony----

	venue	freq
0	Indian Restaurant	0.14
1	Deli / Bodega	0.07
2	Bakery	0.07
3	Sandwich Place	0.07
4	Restaurant	0.07

----Lodhi Road----

	venue	freq
0	Diner	0.07
1	Chinese Restaurant	0.07
2	Temple	0.07
3	Food Court	0.07
4	Café	0.07

----MG Road----

	venue	freq
0	Electronics Store	0.25
1	Furniture / Home Store	0.25
2	Indian Restaurant	0.25
3	Art Museum	0.25
4	ATM	0.00

----MGF Metropolitan Mall, Saket----

	venue	freq
0	Indian Restaurant	0.13
1	Lounge	0.07

```
1          Lounge 0.07
2          Bar 0.07
3    Clothing Store 0.07
4    Chinese Restaurant 0.06
```

----MGM Club, Daryaganj----

```
      venue  freq
0    Indian Restaurant 0.33
1      Restaurant 0.33
2      Road 0.17
3      Hotel 0.17
4      ATM 0.00
```

----Mahipalpur----

```
      venue  freq
0      Hotel 0.25
1      Spa 0.08
2    American Restaurant 0.08
3      Plaza 0.08
4      Shoe Store 0.08
```

----Maidens Hotel, Civil Lines----

```
      venue  freq
0      Hotel 0.17
1    Light Rail Station 0.17
2    Indian Restaurant 0.17
3      Café 0.17
4    Asian Restaurant 0.17
```

----Majnu ka Tila----

```
      venue  freq
0    Asian Restaurant 0.33
1      Hotel 0.11
2    Tibetan Restaurant 0.11
3      Bus Station 0.11
4      Restaurant 0.11
```

----Malviya Nagar----

```
      venue  freq
0      Coffee Shop 0.18
1      Donut Shop 0.09
2      Park 0.09
3      Sandwich Place 0.09
4    Miscellaneous Shop 0.09
```

----Mandi House----

```
      venue  freq
0      Theater 0.20
1      Café 0.13
2    Indian Restaurant 0.13
3      Art Gallery 0.13
4      Bakery 0.13
```

----Mathura Road----

```
      venue  freq
0      Breakfast Spot 0.33
1      Indian Sweet Shop 0.33
2      Indian Restaurant 0.33
3      ATM 0.00
4    Northeast Indian Restaurant 0.00
```

----Mayapuri Phase 2----

```
      venue  freq
0      Garden 0.25
1      Restaurant 0.25
```

1	Restaurants	0.25
2	Food Truck	0.25
3	Auto Garage	0.25
4	ATM	0.00

----Mayur Vihar Phase 1----

	venue	freq
0	ATM	0.17
1	Indian Restaurant	0.17
2	Garden	0.17
3	Gym / Fitness Center	0.17
4	Bistro	0.17

----Mayur Vihar Phase 2----

	venue	freq
0	Sandwich Place	0.2
1	Wings Joint	0.2
2	Juice Bar	0.2
3	Ice Cream Shop	0.2
4	Café	0.2

----Mayur Vihar Phase 3----

	venue	freq
0	ATM	0.33
1	Fried Chicken Joint	0.33
2	Hotel	0.33
3	Northeast Indian Restaurant	0.00
4	Multiplex	0.00

----Mehrauli----

	venue	freq
0	Thai Restaurant	0.3
1	Bar	0.2
2	Lounge	0.1
3	Monument / Landmark	0.1
4	Historic Site	0.1

----Metro Walk Mall, Rohini----

	venue	freq
0	Theme Park	0.2
1	Pizza Place	0.2
2	Shopping Mall	0.2
3	Fast Food Restaurant	0.2
4	Asian Restaurant	0.2

----Model Town 1----

	venue	freq
0	Pool Hall	0.25
1	Playground	0.25
2	Convenience Store	0.25
3	Food Truck	0.25
4	Northeast Indian Restaurant	0.00

----Model Town 2----

	venue	freq
0	Donut Shop	0.2
1	Pizza Place	0.2
2	Coffee Shop	0.2
3	Ice Cream Shop	0.2
4	Fast Food Restaurant	0.2

----Model Town 3----

	venue	freq
0	Indian Restaurant	0.5
1	Park	0.5

2	ATM	0.0
3	Northeast Indian Restaurant	0.0
4	Multicuisine Indian Restaurant	0.0

----Moments Mall, Kirti Nagar----

	venue	freq
0	Metro Station	0.17
1	Train Station	0.08
2	Moving Target	0.08
3	Café	0.08
4	Asian Restaurant	0.08

----Moti Bagh----

	venue	freq
0	Pizza Place	0.25
1	Arcade	0.25
2	Café	0.25
3	South Indian Restaurant	0.25
4	ATM	0.00

----Moti Nagar----

	venue	freq
0	Metro Station	0.33
1	Fried Chicken Joint	0.33
2	Ice Cream Shop	0.33
3	ATM	0.00
4	Multiplex	0.00

----Mukherjee Nagar----

	venue	freq
0	Gym / Fitness Center	0.33
1	Ice Cream Shop	0.33
2	Bakery	0.33
3	ATM	0.00
4	North Indian Restaurant	0.00

----Munirka----

	venue	freq
0	Indian Restaurant	0.11
1	Grocery Store	0.11
2	Sandwich Place	0.11
3	Flea Market	0.11
4	Furniture / Home Store	0.11

----Najafgarh----

	venue	freq
0	ATM	0.33
1	Electronics Store	0.33
2	Food & Drink Shop	0.33
3	Northeast Indian Restaurant	0.00
4	Multiplex	0.00

----Naraina----

	venue	freq
0	Pizza Place	0.25
1	Snack Place	0.25
2	Indian Restaurant	0.25
3	Café	0.25
4	ATM	0.00

----Nehru Place----

	venue	freq
0	Fast Food Restaurant	0.07
1	Food	0.07

1	Chinese Restaurant	0.07
2	Coffee Shop	0.07
3	Sandwich Place	0.03

----Netaji Subhash Place----

	venue	freq
0	Indian Restaurant	0.21
1	Fast Food Restaurant	0.14
2	Coffee Shop	0.14
3	Shopping Mall	0.07
4	Multiplex	0.07

----New Friends Colony----

	venue	freq
0	Café	0.19
1	Indian Restaurant	0.12
2	Diner	0.06
3	Hotel	0.06
4	Pizza Place	0.06

----Nizamuddin----

	venue	freq
0	Garden	0.2
1	Indian Restaurant	0.2
2	Mughlai Restaurant	0.1
3	Pizza Place	0.1
4	Park	0.1

----Okhla Phase 1----

	venue	freq
0	ATM	0.25
1	Bike Rental / Bike Share	0.25
2	Cosmetics Shop	0.25
3	Auto Garage	0.25
4	Northeast Indian Restaurant	0.00

----PVR Anupam Complex----

	venue	freq
0	Café	0.14
1	Coffee Shop	0.14
2	Middle Eastern Restaurant	0.14
3	Multiplex	0.14
4	Pizza Place	0.14

----Pacific Mall, Tagore Garden----

	venue	freq
0	Coffee Shop	0.11
1	Restaurant	0.11
2	Donut Shop	0.11
3	Shopping Mall	0.11
4	Multiplex	0.11

----Paharganj----

	venue	freq
0	Hotel	0.40
1	Indian Restaurant	0.10
2	Restaurant	0.05
3	Café	0.05
4	Korean Restaurant	0.02

----Palam----

	venue	freq
0	CosmeticsShop	1.0
1	ATM	0.0

2	Office	0.0
3	Multiplex	0.0
4	Museum	0.0

----Palate of Delhi, Chanakyapuri----

	venue	freq
0	Golf Course	0.25
1	Burger Joint	0.25
2	Bakery	0.25
3	Sake Bar	0.25
4	Northeast Indian Restaurant	0.00

----Panchsheel Park----

	venue	freq
0	Pizza Place	0.17
1	Gaming Cafe	0.17
2	Event Space	0.17
3	American Restaurant	0.17
4	Bar	0.17

----Pandara Road Market----

	venue	freq
0	Indian Restaurant	0.27
1	Playground	0.07
2	Cafeteria	0.07
3	Chinese Restaurant	0.07
4	Food & Drink Shop	0.07

----Pandav Nagar----

	venue	freq
0	Dessert Shop	0.22
1	Food & Drink Shop	0.11
2	Moving Target	0.11
3	Convenience Store	0.11
4	Restaurant	0.11

----Paschim Vihar----

	venue	freq
0	Multicuisine Indian Restaurant	0.12
1	Indian Restaurant	0.12
2	Chinese Restaurant	0.12
3	Coffee Shop	0.12
4	Market	0.12

----Patparganj----

	venue	freq
0	Indian Restaurant	0.25
1	Dessert Shop	0.12
2	Pizza Place	0.12
3	Café	0.12
4	Shopping Mall	0.12

----Piccadily Hotel, Janakpuri----

	venue	freq
0	Indian Restaurant	0.17
1	Music Store	0.08
2	BBQ Joint	0.08
3	Sandwich Place	0.08
4	Coffee Shop	0.08

----Pitampura----

	venue	freq
0	Fast Food Restaurant	0.25
1	Snack Place	0.25

	venue	freq
2	Indian Restaurant	0.25
3	Market	0.25
4	Office	0.00

----Pragati Maidan----

	venue	freq
0	Pool	0.25
1	Museum	0.12
2	Historic Site	0.12
3	History Museum	0.12
4	Art Museum	0.12

----Prashant Vihar----

	venue	freq
0	Pizza Place	0.33
1	Indian Restaurant	0.33
2	Multiplex	0.17
3	Shopping Mall	0.17
4	ATM	0.00

----Preet Vihar----

	venue	freq
0	Chinese Restaurant	0.14
1	Ice Cream Shop	0.14
2	Pizza Place	0.14
3	Light Rail Station	0.14
4	Fast Food Restaurant	0.14

----Premier Inn, Shalimar Bagh----

	venue	freq
0	Hotel	0.5
1	Café	0.5
2	ATM	0.0
3	Office	0.0
4	Multiplex	0.0

----Pride Plaza Hotel, Aerocity----

	venue	freq
0	Hotel	0.38
1	Indian Restaurant	0.08
2	Coffee Shop	0.08
3	Bed & Breakfast	0.04
4	Gastropub	0.04

----Punjabi Bagh----

	venue	freq
0	Donut Shop	0.12
1	Hookah Bar	0.12
2	Garden Center	0.12
3	Convenience Store	0.12
4	Indian Restaurant	0.12

----Qutab Institutional Area----

	venue	freq
0	Indian Restaurant	0.25
1	Restaurant	0.25
2	Moroccan Restaurant	0.12
3	Modern European Restaurant	0.12
4	Food Truck	0.12

----R K Puram----

	venue	freq
0	Comfort Food Restaurant	0.12
1	Thai Restaurant	0.12

2	Electronics Store	0.12
3	Café	0.12
4	Multiplex	0.12

----Race Course----

	venue	freq
0	Women's Store	0.2
1	Food	0.2
2	Racetrack	0.2
3	Gym / Fitness Center	0.2
4	History Museum	0.2

----Radisson Blu Plaza Delhi, Mahipalpur----

	venue	freq
0	Spa	0.17
1	Thai Restaurant	0.17
2	Plaza	0.17
3	Indian Restaurant	0.17
4	American Restaurant	0.17

----Radisson Blu, Paschim Vihar----

	venue	freq
0	Hotel	0.33
1	Indian Restaurant	0.17
2	Coffee Shop	0.17
3	Food Truck	0.17
4	Fast Food Restaurant	0.17

----Rajendra Place----

	venue	freq
0	Fast Food Restaurant	0.14
1	Pizza Place	0.14
2	Spa	0.07
3	Smoke Shop	0.07
4	Gym / Fitness Center	0.07

----Rajinder Nagar----

	venue	freq
0	Sandwich Place	0.17
1	Pizza Place	0.17
2	Gym / Fitness Center	0.17
3	Market	0.17
4	Café	0.17

----Rajouri Garden----

	venue	freq
0	Indian Restaurant	0.2
1	Café	0.2
2	Pub	0.1
3	Fast Food Restaurant	0.1
4	Bakery	0.1

----Rohini----

	venue	freq
0	Department Store	0.2
1	Shopping Mall	0.2
2	Indian Restaurant	0.2
3	Light Rail Station	0.2
4	Fast Food Restaurant	0.2

----Roseate House, Aerocity----

	venue	freq
0	Hotel	0.36
1	Coffee Shop	0.08



1	Coffee Shop	0.08
2	Indian Restaurant	0.08
3	Restaurant	0.04
4	Punjabi Restaurant	0.04

----SDA----

	venue	freq
0	Café	0.31
1	Indian Restaurant	0.23
2	Beer Garden	0.08
3	Coffee Shop	0.08
4	Asian Restaurant	0.08

----Safdarjung----

	venue	freq
0	Café	0.2
1	Indian Restaurant	0.2
2	American Restaurant	0.1
3	Nightclub	0.1
4	Jazz Club	0.1

----Sainik Farms----

	venue	freq
0	Asian Restaurant	0.33
1	Diner	0.17
2	Pub	0.17
3	Restaurant	0.17
4	Bakery	0.17

----Saket----

	venue	freq
0	Indian Restaurant	0.18
1	Fast Food Restaurant	0.12
2	Falafel Restaurant	0.06
3	Coffee Shop	0.06
4	Kebab Restaurant	0.06

----Sangam Courtyard, RK Puram----

	venue	freq
0	Multiplex	0.15
1	Coffee Shop	0.15
2	Asian Restaurant	0.08
3	Restaurant	0.08
4	Convenience Store	0.08

----Sarita Vihar----

	venue	freq
0	Park	0.5
1	Café	0.5
2	ATM	0.0
3	Northeast Indian Restaurant	0.0
4	Multiplex	0.0

----Sarojini Nagar----

	venue	freq
0	Fast Food Restaurant	0.4
1	Pizza Place	0.2
2	Snack Place	0.2
3	Indian Restaurant	0.2
4	ATM	0.0

----Satyaniketan----

	venue	freq
0	Bistro	0.17
1	Snack Place	0.17

1      Salon Place      0.17  
2      Deli / Bodega    0.17  
3      Salad Place      0.17  
4      Café            0.17

----Sector 15, Dwarka----

	venue	freq
0	Light Rail Station	0.33
1	Train Station	0.33
2	Restaurant	0.33
3	ATM	0.00
4	Office	0.00

----Select Citywalk Mall, Saket----

	venue	freq
0	Indian Restaurant	0.14
1	Lounge	0.07
2	Bar	0.07
3	Clothing Store	0.07
4	Chinese Restaurant	0.05

----Shahdara----

	venue	freq
0	ATM	0.25
1	Park	0.25
2	Mobile Phone Shop	0.25
3	Chocolate Shop	0.25
4	Northeast Indian Restaurant	0.00

----Shahpur Jat----

	venue	freq
0	Bar	0.25
1	Australian Restaurant	0.12
2	Italian Restaurant	0.12
3	Stadium	0.12
4	Indian Restaurant	0.12

----Shakarpur----

	venue	freq
0	Diner	0.17
1	Light Rail Station	0.17
2	Shopping Mall	0.17
3	Gym	0.17
4	Coffee Shop	0.17

----Shalimar Bagh----

	venue	freq
0	ATM	0.14
1	Pizza Place	0.14
2	Convenience Store	0.14
3	Gym / Fitness Center	0.14
4	Coffee Shop	0.14

----Shangri La's - Eros hotel, Janpath----

	venue	freq
0	Hotel	0.17
1	Indian Restaurant	0.14
2	Spa	0.10
3	Chinese Restaurant	0.07
4	Italian Restaurant	0.07

----Shanti Niketan Marg----

	venue	freq
0	Gourmet Shop	0.25
1	Pizza Place	0.25

```
1 -----
2 Convenience Store 0.25
3 Café 0.25
4 ATM 0.00
```

----Sheikh Sarai----

```
venue freq
0 Thai Restaurant 0.38
1 Italian Restaurant 0.12
2 Whisky Bar 0.12
3 Historic Site 0.12
4 Café 0.12
```

----Sheraton New Delhi Hotel, Saket----

```
venue freq
0 Indian Restaurant 0.16
1 Clothing Store 0.09
2 Bar 0.07
3 Shopping Mall 0.05
4 Lounge 0.05
```

----South Extension 1----

```
venue freq
0 Coffee Shop 0.23
1 Indian Restaurant 0.15
2 Pizza Place 0.15
3 Fast Food Restaurant 0.08
4 Clothing Store 0.08
```

----South Extension 2----

```
venue freq
0 Indian Restaurant 0.22
1 Coffee Shop 0.17
2 Market 0.11
3 Pizza Place 0.11
4 Fast Food Restaurant 0.06
```

----Southern Park Mall, Saket----

```
venue freq
0 Indian Restaurant 0.13
1 Bar 0.07
2 Lounge 0.07
3 Clothing Store 0.07
4 Chinese Restaurant 0.06
```

----Spark Mall, Kamla Nagar----

```
venue freq
0 Breakfast Spot 0.13
1 Fast Food Restaurant 0.13
2 Pizza Place 0.09
3 Chinese Restaurant 0.09
4 Indian Restaurant 0.09
```

----Star City Mall, Mayur Vihar Phase 1----

```
venue freq
0 Hotel 0.29
1 Restaurant 0.12
2 Department Store 0.12
3 Indian Restaurant 0.06
4 Bakery 0.06
```

----Subhash Nagar----

```
venue freq
0 Multiplex 0.2
1 Pizza Place 0.2
```

1	Skating Rink	0.2
3	Park	0.2
4	Sculpture Garden	0.2

----Sunder Nagar----

	venue	freq
0	Indian Restaurant	0.23
1	Hotel	0.15
2	Italian Restaurant	0.15
3	Gaming Cafe	0.08
4	Café	0.08

----T3 Domestic Arrival, Aerocity----

	venue	freq
0	Coffee Shop	0.29
1	Dessert Shop	0.14
2	Airport Service	0.14
3	Pizza Place	0.14
4	Café	0.14

----TDI Mall, Rajouri Garden----

	venue	freq
0	Café	0.15
1	Fast Food Restaurant	0.15
2	Indian Restaurant	0.15
3	Dessert Shop	0.08
4	Multiplex	0.04

----Tagore Garden----

	venue	freq
0	Indian Restaurant	0.2
1	Train Station	0.1
2	Park	0.1
3	BBQ Joint	0.1
4	Pizza Place	0.1

----Taj Vivanta, Khan Market----

	venue	freq
0	Café	0.17
1	Coffee Shop	0.08
2	Bar	0.06
3	Chinese Restaurant	0.06
4	Bookstore	0.04

----The Ashok, Chanakyapuri----

	venue	freq
0	Indian Restaurant	0.20
1	Nightclub	0.20
2	Mediterranean Restaurant	0.07
3	Italian Restaurant	0.07
4	Shopping Mall	0.07

----The Claridges, Aurangzeb Road----

	venue	freq
0	Hotel	0.22
1	Chinese Restaurant	0.11
2	Smoke Shop	0.11
3	Mediterranean Restaurant	0.11
4	North Indian Restaurant	0.11

----The Grand New Delhi, Vasant Kunj----

	venue	freq
0	Coffee Shop	0.12
1	Fast Food Restaurant	0.08

1	Leela Restaurant	0.08
2	Clothing Store	0.08
3	Asian Restaurant	0.04
4	Chinese Restaurant	0.04

----The Imperial, Janpath----

	venue	freq
0	Hotel	0.14
1	Indian Restaurant	0.14
2	Italian Restaurant	0.09
3	Mediterranean Restaurant	0.06
4	Café	0.06

----The India Mall, New Friends Colony----

	venue	freq
0	Café	0.17
1	Indian Restaurant	0.11
2	Diner	0.06
3	Hotel	0.06
4	Pizza Place	0.06

----The Lalit New Delhi, Barakhamba Road----

	venue	freq
0	Indian Restaurant	0.25
1	Bakery	0.25
2	Hotel	0.12
3	Hotel Bar	0.12
4	Asian Restaurant	0.12

----The Leela Ambience Convention Hotel----

	venue	freq
0	Multiplex	0.2
1	Shopping Mall	0.2
2	Indian Restaurant	0.2
3	Café	0.2
4	Hotel	0.2

----The Leela Palace, Chanakyapuri----

	venue	freq
0	Indian Restaurant	0.15
1	Cocktail Bar	0.08
2	Breakfast Spot	0.08
3	Spa	0.08
4	Gym / Fitness Center	0.08

----The Lodhi, Lodhi Road----

	venue	freq
0	Hotel	0.13
1	Indian Restaurant	0.13
2	Chinese Restaurant	0.13
3	Shop & Service	0.07
4	BBQ Joint	0.07

----The Park, Connaught Place----

	venue	freq
0	Hotel	0.16
1	Restaurant	0.06
2	Italian Restaurant	0.06
3	Mediterranean Restaurant	0.06
4	Spa	0.06

----The Suryaa New Delhi, New Friends Colony----

	venue	freq
0	Café	0.15
1	Indian Restaurant	0.10

1	Indian Restaurant	0.12
2	Diner	0.05
3	Thai Restaurant	0.05
4	Pizza Place	0.05

----The Taj Mahal Hotel, Mansingh Road----

	venue	freq
0	Japanese Restaurant	0.2
1	Indian Restaurant	0.2
2	Restaurant	0.2
3	Hotel Bar	0.2
4	Chinese Restaurant	0.2

----The Taj Palace Hotel, Chanakyapuri----

	venue	freq
0	Hotel	0.12
1	Indian Restaurant	0.12
2	Café	0.09
3	Chinese Restaurant	0.06
4	Hotel Pool	0.03

----The Uppal, Aerocity----

	venue	freq
0	Hotel	0.75
1	Indian Restaurant	0.25
2	ATM	0.00
3	Northeast Indian Restaurant	0.00
4	Multicuisine Indian Restaurant	0.00

----The Village Restaurant Complex, Khel Gaon Marg----

	venue	freq
0	Bar	0.17
1	Karaoke Bar	0.08
2	Indian Restaurant	0.08
3	Furniture / Home Store	0.08
4	Stadium	0.08

----Tilak Nagar----

	venue	freq
0	Fast Food Restaurant	0.50
1	Light Rail Station	0.25
2	North Indian Restaurant	0.25
3	ATM	0.00
4	Office	0.00

----Tughlakabad Institutional Area----

	venue	freq
0	Restaurant	0.25
1	Market	0.25
2	Hotel	0.25
3	Chinese Restaurant	0.25
4	ATM	0.00

----Uday Park----

	venue	freq
0	Metro Station	0.12
1	Pizza Place	0.12
2	Music Venue	0.12
3	Shopping Mall	0.12
4	Park	0.12

----Unity One Mall, Janakpuri----

	venue	freq
0	MetroStation	0.17
1	Sandwich Place	0.17

1           Sankhlesh Mall   0.17  
2           Pizza Place   0.17  
3   Indian Restaurant   0.17  
4           Coffee Shop   0.17

----Uttam Nagar----

	venue	freq
0	ATM	0.67
1	Indian Restaurant	0.33
2	Northeast Indian Restaurant	0.00
3	Multicuisine Indian Restaurant	0.00
4	Multiplex	0.00

----V3S Mall, Laxmi Nagar----

	venue	freq
0	Fast Food Restaurant	0.13
1	Mediterranean Restaurant	0.07
2	Office	0.07
3	Food Court	0.07
4	Gift Shop	0.07

----Vasant Kunj----

	venue	freq
0	Dessert Shop	0.17
1	Vegetarian / Vegan Restaurant	0.17
2	Bar	0.17
3	Fast Food Restaurant	0.17
4	Chinese Restaurant	0.17

----Vasant Square Mall, Vasant Kunj----

	venue	freq
0	Dessert Shop	0.12
1	Chinese Restaurant	0.12
2	Pizza Place	0.12
3	Vegetarian / Vegan Restaurant	0.12
4	Fast Food Restaurant	0.12

----Vasant Vihar----

	venue	freq
0	Café	0.14
1	Chinese Restaurant	0.07
2	Coffee Shop	0.07
3	Fast Food Restaurant	0.07
4	Restaurant	0.07

----Vasundhara Enclave----

	venue	freq
0	ATM	0.5
1	Snack Place	0.5
2	Pool	0.0
3	Multicuisine Indian Restaurant	0.0
4	Multiplex	0.0

----Vijay Nagar----

	venue	freq
0	Café	0.19
1	Coffee Shop	0.06
2	Food Truck	0.06
3	North Indian Restaurant	0.06
4	Cheese Shop	0.06

----Vikas Marg----

	venue	freq
0	Snack Place	0.14
1	Burger Joint	0.14

1 Burger House 0.14  
2 Gym 0.14  
3 Burrito Place 0.14  
4 Park 0.14

----Vikaspuri----

	venue	freq
0	Beer Garden	0.33
1	Pizza Place	0.33
2	Fast Food Restaurant	0.33
3	ATM	0.00
4	Northeast Indian Restaurant	0.00

----Vivek Vihar----

	venue	freq
0	Juice Bar	0.33
1	ATM	0.17
2	Gift Shop	0.17
3	Bed & Breakfast	0.17
4	Athletics & Sports	0.17

----West End Mall, Janak Puri----

	venue	freq
0	Indian Restaurant	0.15
1	Restaurant	0.08
2	Fast Food Restaurant	0.08
3	Sandwich Place	0.08
4	BBQ Joint	0.08

----West Gate Mall, Rajouri Garden----

	venue	freq
0	Fast Food Restaurant	0.19
1	Café	0.12
2	Indian Restaurant	0.12
3	Multiplex	0.06
4	American Restaurant	0.06

----West Patel Nagar----

	venue	freq
0	Pizza Place	0.25
1	Pharmacy	0.25
2	Fast Food Restaurant	0.25
3	Chinese Restaurant	0.25
4	ATM	0.00

----Worldmark 1, Aerocity----

	venue	freq
0	Hotel	0.33
1	Bed & Breakfast	0.07
2	Coffee Shop	0.07
3	Indian Restaurant	0.07
4	Train Station	0.04

----Yusuf Sarai----

	venue	freq
0	Indian Restaurant	0.25
1	Coffee Shop	0.17
2	Ice Cream Shop	0.08
3	Bar	0.08
4	Asian Restaurant	0.08

----ibis New Delhi, Aerocity----

	venue	freq
0	Hotel	0.36
1	Coffee Shop	0.08



```
2   Indian Restaurant  0.08
3       Restaurant  0.04
4   Punjabi Restaurant  0.04
```

In [34]:

```
## put that into a pandas dataframe
## First, write a function to sort the venues in descending order.

def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending=False)

    return row_categories_sorted.index.values[0:num_top_venues]
```

In [35]:

```
## create the new dataframe and display the top 10 venues for each Locality.

num_top_venues = 10

indicators = ['st', 'nd', 'rd']

# create columns according to number of top venues
columns = ['Locality']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))

# create a new dataframe
Locality_venues_sorted = pd.DataFrame(columns=columns)
Locality_venues_sorted['Locality'] = New_Delhi_grouped['Locality']

for ind in np.arange(New_Delhi_grouped.shape[0]):
    Locality_venues_sorted.iloc[ind, 1:] = return_most_common_venues(New_Delhi_grouped.i
loc[ind, :], num_top_venues)

Locality_venues_sorted
```

Out[35]:

	Locality	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 M Common Ven
0	ARSS Mall, Paschim Vihar	Indian Restaurant	ATM	Coffee Shop	Multicuisine Indian Restaurant	Sandwich Place	Chinese Restaurant	Market	Pizza Place	Fis Ch SI
1	Adchini	Indian Restaurant	Café	Pub	Restaurant	Women's Store	Farmers Market	Fried Chicken Joint	French Restaurant	Fr Tr
2	Aditya Mega Mall, Karkardooma	Pizza Place	Indian Restaurant	Shopping Mall	Multiplex	Hotel	Café	Fast Food Restaurant	Fried Chicken Joint	Fre Restaur
3	Aerocity	Hotel	Airport Terminal	Airport Lounge	Rental Car Location	Coffee Shop	Fast Food Restaurant	French Restaurant	Food Truck	Fis Ch SI
4	Aggarwal City Mall, Pitampura	Department Store	Indian Restaurant	Multiplex	Café	Fish & Chips Shop	Furniture / Home Store	Frozen Yogurt Shop	Fried Chicken Joint	Fre Restaur
...	...	...	...	...	...	...	...	...	...	
233	West Gate Mall, Rajouri Garden	Fast Food Restaurant	Indian Restaurant	Café	Cosmetics Shop	Hookah Bar	Dessert Shop	Restaurant	Chinese Restaurant	Multip

234	West Patel Locality	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
235	Worldmark 1, Aerocity	Hotel	Bed & Breakfast	Coffee Shop	Indian Restaurant	Lounge	Punjabi Restaurant	Gastropub	Restaurant	Bak
236	Yusuf Sarai	Indian Restaurant	Coffee Shop	Hotel	Japanese Restaurant	Bar	Ice Cream Shop	Park	Asian Restaurant	Kor Restaur
237	ibis New Delhi, Aerocity	Hotel	Indian Restaurant	Coffee Shop	Bakery	Punjabi Restaurant	Gastropub	Bed & Breakfast	Restaurant	Ti Stal

238 rows × 11 columns

In [36]:

```
## Cluster Locality
## Run k-means to cluster the Locality into 5 clusters.

# set number of clusters
kclusters = 5

New_Delhi_clustering = New_Delhi_grouped.drop('Locality', 1)

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

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:10]
kmeans.labels_.shape
```

Out[36]:

(238,)

In [39]:

```
# add clustering labels
New_Delhi_merged = df_final.head(238)
New_Delhi_merged['Cluster Labels'] = kmeans.labels_

# merge New_Delhi_grouped with df_Chinese to add latitude/longitude for each Locality
New_Delhi_merged = New_Delhi_merged.join(Locality_venues_sorted.set_index('Locality'), o
n='Locality')

New_Delhi_merged.head()
```

/usr/local/lib/python3.6/dist-packages/ipykernel\_launcher.py:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row\_indexer,col\_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_g
uide/indexing.html#returning-a-view-versus-a-copy
This is separate from the ipykernel package so we can avoid doing imports until

Out[39]:

	Locality	Lat	Lng	No_of_Restaurant	Cusines	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1s Co
0	ARSS Mall, Paschim Vihar	28.668945	77.101544	1	North Indian, South Indian, Chinese, Mithai, F...	3.100000	Average	117	3	Rest
1	Adchini	28.537063	77.197808	13	Fast Food, North Indian, Seafood, Continental,...	3.292308	Average, Good, Poor, Very Good	1560	4	Rest

2	Aditya Mega Mall, Karkardooma	28.656131	77.301266	Eng	No_of_Restaurant	4	Finger Food, North Indian, Chinese, Pizza, Fas...	3.275000	Average, Comments	No_of_Votes	434	Cluster Labels	1s
3	Aerocity	28.553077	77.104270			2	Fast Food, Italian, Pizza, North Indian, Conti...	3.200000	Average		59	2	
4	Aggarwal City Mall, Pitampura	28.690020	77.134650			3	North Indian, Chinese, Street Food, Mithai, No...	3.033333	Average		126	4	Depa



In [40]:

```
# create final map
map_clusters = folium.Map(location=[latitude, longitude], zoom_start=10)

# set color scheme for the clusters
x = np.arange(kclusters)
ys = [i+x+(i*x)**2 for i in range(kclusters)]
#colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
#rainbow = [colors.rgb2hex(i) for i in colors_array]
colors = ['red', 'green', 'blue', 'yellow','orange']

# add markers to the map
markers_colors = []
for lat, lon, poi, cluster in zip(New_Delhi_merged['Lat'], New_Delhi_merged['Lng'], New_Delhi_merged['Locality'], New_Delhi_merged['Cluster Labels']):
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color='black',
        fill=True,
        fill_color=colors[cluster],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```

Out[40]:

Make this Notebook Trusted to load map: File -> Trust Notebook

In [41]:

```
## Examine Clusters

## Cluster 1
New_Delhi_merged.loc[New_Delhi_merged['Cluster Labels'] == 0, New_Delhi_merged.columns[[
1] + list(range(5, New_Delhi_merged.shape[1]))]]
```

Out[41]:

	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
5	28.700516	3.040000	Average, Good, Poor	594	0	Fast Food Restaurant	Electronics Store	Multiplex	Bus Station	Gym / Fitness Center
11	28.562580	3.750000	Average, Good, Very Good	875	0	Japanese Restaurant	Shopping Mall	Karaoke Bar	Fast Food Restaurant	Women's Store
15	28.691136	3.390909	Average, Good, Very Good	485	0	South Indian Restaurant	Pizza Place	Gym / Fitness Center	Garden	Fast Food Restaurant
22	28.654105	3.085714	Average	80	0	Fast Food Restaurant	Pizza Place	Gym	Fish & Chips Shop	Furniture / Home Store
90	28.642755	3.450000	Average, Good	322	0	Fast Food Restaurant	Pizza Place	Hotel	Light Rail Station	Multicuisine Indian Restaurant
94	28.538153	3.117143	Average, Good, Poor	3642	0	Market	Fast Food Restaurant	Bank	Sandwich Place	Pizza Place
101	28.667644	3.300000	Average	132	0	Pizza Place	Historic Site	American Restaurant	Bus Station	Metro Station
104	28.656263	3.097619	Average, Good	965	0	Pizza Place	Fast Food Restaurant	Park	Women's Store	Furniture / Home Store
130	28.724100	3.133333	Average	325	0	Fast Food Restaurant	Theme Park	Shopping Mall	Asian Restaurant	Pizza Place
132	28.706295	3.256000	Average, Good, Very Good	1717	0	Pizza Place	Donut Shop	Ice Cream Shop	Coffee Shop	Fast Food Restaurant
160	28.712975	3.066667	Average	121	0	Pizza Place	Indian Restaurant	Shopping Mall	Multiplex	Fast Food Restaurant
169	28.667261	3.200000	Average	76	0	Hotel	Fast Food Restaurant	Indian Restaurant	Coffee Shop	Food Truck
180	28.534499	3.000000	Average, Good, Poor	173	0	Café	Park	Women's Store	Furniture / Home Store	Frozen Yogurt Shop
218	28.552403	3.833333	Good, Very Good	1133	0	Bar	Furniture / Home Store	Coffee Shop	Indian Restaurant	Italian Restaurant
224	28.636921	2.819231	Average, Good, Poor	2265	0	Fast Food Restaurant	Office	Dessert Shop	Multiplex	Gift Shop
230	28.658041	3.400000	Average	19	0	Café	Park	Burger Joint	Burrito Place	Gym
234	28.630044	2.750000	Average,	238	0	Indian	Light Rail	Coffee Restaurant		Chinese

In [42]:

```
## Examine Clusters
```

```
## Cluster 2
```

```
New_Delhi_merged.loc[New_Delhi_merged['Cluster Labels'] == 1, New_Delhi_merged.columns[[1] + list(range(5, New_Delhi_merged.shape[1]))]]
```

Out[42]:

	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
6	28.527088	3.117391	Average, Good, Poor	1012	1	Chinese Restaurant	Market	Coffee Shop	Hotel	Food & Drink Shop
7	28.541298	3.425000	Average, Good, Very Good	2460	1	Coffee Shop	Shopping Mall	Clothing Store	Café	Asian Restaurant
14	28.693969	3.378571	Average, Good	2343	1	Asian Restaurant	Pizza Place	Indian Restaurant	South Indian Restaurant	Coffee Shop
18	28.696302	3.300000	Average, Good	415	1	Asian Restaurant	Pizza Place	Indian Restaurant	South Indian Restaurant	Coffee Shop
29	28.681233	3.300000	Average, Good, Very Good	769	1	Smoke Shop	Coffee Shop	Burger Joint	Light Rail Station	Chinese Restaurant
...	...	...	...	...	...	...	...	...	...	...
223	28.619954	2.905714	Average, Poor	242	1	ATM	Indian Restaurant	Fast Food Restaurant	Furniture / Home Store	Frozen Yogurt Shop
225	28.524070	3.686364	Average, Good, Very Good	4001	1	Pizza Place	Dessert Shop	Vegetarian / Vegan Restaurant	Bar	Chinese Restaurant
227	28.559704	3.278261	Average, Good, Very Good	1043	1	Café	Fast Food Restaurant	Chinese Restaurant	Restaurant	Coffee Shop
231	28.637492	3.062264	Average, Good, Poor	1253	1	Fast Food Restaurant	Pizza Place	Beer Garden	Fish & Chips Shop	Gaming Cafe
232	28.667344	3.077273	Average, Good, Poor	939	1	Juice Bar	ATM	Bed & Breakfast	Athletics & Sports	Gift Shop

79 rows x 15 columns

In [43]:

```
## Examine Clusters
```

```
## Cluster 3
```

```
New_Delhi_merged.loc[New_Delhi_merged['Cluster Labels'] == 2, New_Delhi_merged.columns[[1] + list(range(5, New_Delhi_merged.shape[1]))]]
```

Out[43]:

	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
--	-----	------------	----------	-------------	----------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

3	28.553077	3.200000	Average	59	2	1st Most Common	Airport Terminal	Airport Lounge	Rental Car Location	5th Most Common
	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	Venue	Venue	Venue	Venue	Venue
10	28.554807	3.000000	Average	4	2	Hotel	Indian Restaurant	Coffee Shop	Punjabi Restaurant	Mughal Restaurant
12	28.641698	3.050000	Average	17	2	Hotel	Hostel	Movie Theater	Campground	Indian Restaurant
19	28.548827	2.700000	Average	9	2	Hotel	Accessories Store	Italian Restaurant	Indian Restaurant	Bakery
25	28.495624	2.700000	Average	23	2	Japanese Restaurant	Indian Restaurant	Donut Shop	Hotel	Light Station
35	28.590297	3.350000	Average, Good	127	2	Hotel	Pizza Place	Restaurant	Asian Restaurant	Archeological Site
56	28.570246	4.050000	Average, Excellent	1949	2	Hotel	Café	Neighborhood	Gym	Sculpture Garden
60	28.665829	4.000000	Very Good	756	2	Hotel	Asian Restaurant	Indian Restaurant	BBQ Joint	Cafe
69	28.550327	3.300000	Average	30	2	Hotel	Bed & Breakfast	Coffee Shop	Indian Restaurant	Local Market
70	28.590654	3.550000	Average, Good	302	2	Hotel	Restaurant	Liquor Store	Market	Light Station
71	28.641003	3.650000	Average, Good	367	2	Hotel	Indian Restaurant	Hostel	Soccer Stadium	Museum Theater
72	28.705700	3.350000	Average, Good	278	2	Park	Coffee Shop	Hotel	Bakery	Garden
74	28.621267	3.416667	Average, Good	475	2	Hotel	Indian Restaurant	Spa	Restaurant	Italian Restaurant
83	28.552895	3.300000	Average	15	2	Hotel	Indian Restaurant	Coffee Shop	Bakery	Pure Restaurant
111	28.618772	3.666667	Average, Good, Very Good	725	2	Hotel	Indian Restaurant	Restaurant	Spa	Nightclub
112	28.552036	3.500000	Good	26	2	Hotel	Indian Restaurant	Coffee Shop	Bakery	Pure Restaurant
119	28.545033	2.960000	Average, Good	259	2	Hotel	Plaza	Hotel Bar	Thai Restaurant	Cafe
128	28.608252	2.945000	Average, Good	406	2	ATM	Fried Chicken Joint	Hotel	Fast Food Restaurant	Furniture Home Store
148	28.642402	3.195652	Average, Good	2177	2	Restaurant	Coffee Shop	Shopping Mall	Multiplex	Dessert Shop
161	28.639872	3.134483	Average, Good, Poor	1481	2	Pizza Place	Arcade	Chinese Restaurant	BBQ Joint	Light Station
162	28.725814	3.050000	Average	50	2	Café	Hotel	Women's Store	Furniture / Home Store	Freight Yard Station
167	28.599082	2.900000	Average	9	2	Women's Store	History Museum	Racetrack	Food	Gym/Fitness Center
168	28.543814	3.950000	Average, Excellent, Good, Very Good	1225	2	Plaza	Hotel	Spa	American Restaurant	Restaurant
169	28.543814	3.950000	Average, Good	1225	2	Department Store	Fast Food Restaurant	Indian Restaurant	Shopping Mall	Light Station

173	28.714176	3.352083	Good, Poor, Very Good	4514	2	Department Store	1st Most Common Venue	Fast Food Restaurant	2nd Most Common Venue	Indian Restaurant	3rd Most Common Venue	Shopping Mall	4th Most Common Venue	Light Rail Station	5th Most Common Venue
188	28.707685	3.168182	Average, Good, Very Good	1668	2	ATM		Hotel		Convenience Store		Coffee Shop			Bar
196	28.680905	3.320000	Average, Good	286	2	Fast Food Restaurant		Breakfast Spot		Dumpling Restaurant		Chinese Restaurant			Cosmetics Shop
204	28.597038	3.533333	Average, Good, Very Good	902	2	Indian Restaurant		Nightclub		Café		Italian Restaurant			Vegetarian / Vegan Restaurant
212	28.592147	3.350000	Average, Good	189	2	Indian Restaurant		Chinese Restaurant		Hotel		Convenience Store			Light Station
216	28.594859	3.800000	Good, Very Good	287	2	Indian Restaurant		Hotel		Café		Chinese Restaurant			Nightclub
219	28.638846	3.048148	Average, Good	290	2	Fast Food Restaurant		North Indian Restaurant		Light Rail Station		Furniture / Home Store			Fast Food Restaurant
235	28.652978	3.500000	Good	178	2	Fast Food Restaurant		Indian Restaurant		Café		Cosmetics Shop			Hospital
237	28.550257	3.220000	Average, Good	77	2	Hotel		Bed & Breakfast		Coffee Shop		Indian Restaurant			Local Store

In [44]:

```
## Examine Clusters

## Cluster 4
New_Delhi_merged.loc[New_Delhi_merged['Cluster Labels'] ==3 , New_Delhi_merged.columns[[1] + list(range(5, New_Delhi_merged.shape[1]))]]
```

Out[44]:

	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	28.668945	3.100000	Average	117	3	Indian Restaurant	ATM	Coffee Shop	Multicuisine Indian Restaurant	Sandwich Place
2	28.656131	3.275000	Average, Good	434	3	Pizza Place	Indian Restaurant	Shopping Mall	Multiplex	Hotel
13	28.690182	3.090000	Average, Good, Poor	971	3	Market	Snack Place	Pizza Place	BBQ Joint	Smoke Shop
23	28.656414	3.358182	Average, Good, Very Good	6668	3	Indian Restaurant	Snack Place	Dessert Shop	Market	Train Station
24	28.649658	3.800000	Average, Excellent, Good, Very Good	1410	3	Mosque	Paper / Office Supplies Store	Hardware Store	Fast Food Restaurant	Light Rail Station
26	28.538688	3.130303	Average, Good, Poor	2578	3	Market	Indian Restaurant	Park	Chinese Restaurant	Farmers Market
33	28.657388	3.320000	Average, Good	636	3	Indian Restaurant	Pizza Place	Multiplex	Hotel	Women's Store
36	28.692546	3.480000	Average, Good	948	3	Indian Restaurant	Coffee Shop	Fast Food Restaurant	Diner	Shopping Mall
42	28.576161	3.082222	Average, Good	512	3	Indian Restaurant	Fast Food Restaurant	Women's Store	Market	Dessert Shop

id	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
42	28.570101	2.983333	Good, Poor, Average, Good, Poor, Very Good	342	3	Indian Restaurant	Hotel	Hostel	Restaurant	Road
44	28.574288	3.496154	Average, Good, Poor, Very Good	15579	3	Indian Restaurant	Italian Restaurant	Bakery	Market	Coffee Shop
46	28.573241	3.225000	Average, Good, Poor	1106	3	Northeast Indian Restaurant	Indian Restaurant	Train Station	Restaurant	Market
47	28.681582	3.046875	Average, Good, Poor	1224	3	Indian Restaurant	Dry Cleaner	Bank	Market	Health & Beauty Service
49	28.602169	2.900000	Average	7	3	Indian Restaurant	Golf Course	Italian Restaurant	North Indian Restaurant	Snack Place
55	28.617102	4.200000	Very Good	3010	3	Indian Restaurant	Women's Store	Fast Food Restaurant	Furniture / Home Store	Frozen Yogurt Shop
59	28.654883	3.053846	Average, Good	262	3	Indian Restaurant	Burger Joint	Women's Store	Fish & Chips Shop	Furniture / Home Store
61	28.668181	3.400000	Average	33	3	Pizza Place	Indian Restaurant	Ice Cream Shop	Food Court	Bakery
65	28.556980	3.272414	Average, Good, Poor	5243	3	Indian Restaurant	Coffee Shop	Pizza Place	Donut Shop	Light Rail Station
76	28.576785	3.200000	Average, Good	143	3	Indian Restaurant	Train Station	Northeast Indian Restaurant	Market	Women's Store
77	28.631728	3.060714	Average, Good, Poor, Very Good	1650	3	Indian Restaurant	Market	Dessert Shop	Pizza Place	Shopping Mall
84	28.630942	3.122000	Average, Good, Poor, Very Good	1738	3	Indian Restaurant	Pizza Place	Indian Sweet Shop	Ice Cream Shop	Fried Chicken Joint
85	28.648885	3.561111	Average, Good, Very Good	7411	3	Indian Restaurant	Mosque	Flea Market	Frozen Yogurt Shop	Metro Station
92	28.584294	3.100000	Average	35	3	Indian Restaurant	Record Shop	Bakery	Metro Station	Women's Store
97	28.662972	3.533333	Average, Very Good	293	3	Moving Target	Indian Restaurant	Vegetarian / Vegan Restaurant	Fried Chicken Joint	Fast Food Restaurant
98	28.651527	3.490909	Average, Good, Very Good	3222	3	Pizza Place	Indian Restaurant	Food Truck	Light Rail Station	Women's Store
99	28.648795	3.238028	Average, Good, Poor, Very Good	7282	3	Indian Restaurant	Fast Food Restaurant	Pizza Place	Coffee Shop	Snack Place
113	28.541242	2.984615	Average	817	3	Indian Restaurant	Pizza Place	Bakery	Fast Food Restaurant	Soccer Stadium
116	28.486576	2.950000	Average	8	3	Furniture / Home Store	Indian Restaurant	Electronics Store	Art Museum	Women's Store



	Lat	Long	Agg_Rating	Comments_Average	No_of_Votes	Cluster_Labels	1st Most Common Restaurant Venue	2nd Most Common Restaurant Venue	3rd Most Common Restaurant Venue	4th Most Common Restaurant Venue	5th Most Common Restaurant Venue
118	28.646549	76.200000			20	3					
124	28.521760		4.200000	Very Good	278	3	Indian Sweet Shop	Indian Restaurant	Breakfast Spot	Women's Store	Fish & Chips Shop
126	28.602860		2.973214	Average, Good, Poor	1831	3	ATM	Indian Restaurant	Gym / Fitness Center	Bistro	Garden
133	28.708185		3.344444	Average, Good, Very Good	568	3	Indian Restaurant	Park	Women's Store	Fast Food Restaurant	Furniture / Home Store
142	28.693270		3.519149	Average, Good, Very Good	7642	3	Indian Restaurant	Coffee Shop	Fast Food Restaurant	Diner	Shopping Mall
144	28.591092		3.200000	Average, Good, Poor	993	3	Indian Restaurant	Garden	Pizza Place	Mughlai Restaurant	Monument / Landmark
152	28.544464		3.525000	Average, Very Good	231	3	Pizza Place	American Restaurant	Bar	Nightclub	Event Space
155	28.669160		3.148214	Average, Good, Poor	2735	3	Market	Indian Restaurant	Pizza Place	Garden	Multicuisine Indian Restaurant
157	28.629505		2.600000	Average	67	3	Indian Restaurant	Pizza Place	Coffee Shop	Music Store	Sandwich Place
159	28.613748		3.900000	Average, Excellent	2313	3	Pool	Art Museum	Museum	Café	Historic Site
164	28.668055		3.393333	Average, Excellent, Good, Very Good	4670	3	Coffee Shop	Garden Center	Hookah Bar	Café	Salon / Barbershop
172	28.644281		3.626804	Average, Excellent, Good, Poor, Very Good	25637	3	Indian Restaurant	Café	Diner	Market	Bakery
177	28.511482		2.750000	Average, Poor	107	3	Asian Restaurant	Diner	Pub	Restaurant	Bakery
193	28.569983		3.133333	Average, Good, Poor	988	3	Coffee Shop	Pizza Place	Indian Restaurant	Boutique	Fast Food Restaurant
198	28.636712		3.023529	Average, Poor	185	3	Skating Rink	Park	Multiplex	Sculpture Garden	Pizza Place
201	28.651299		3.500000	Average, Good	479	3	Indian Restaurant	Fast Food Restaurant	Café	Dessert Shop	Cosmetics Shop
203	28.601187		3.633333	Average, Good	1018	3	Café	Coffee Shop	Bar	Chinese Restaurant	Bookstore
208	28.562469		2.971429	Average, Good, Poor	486	3	Café	Indian Restaurant	Diner	Nightclub	Chinese Restaurant
210	28.661133		3.775000	Good, Very Good	460	3	Café	Indian Restaurant	Multiplex	Shopping Mall	Hotel
214	28.561105		3.425000	Average, Good	246	3	Café	Indian Restaurant	Diner	Grocery Store	Chinese Restaurant
222	28.628988		3.260000	Average, Good, Poor	239	3	Pizza Place	Sandwich Place	Indian Restaurant	Coffee Shop	Chinese Restaurant

236	28.648171	3.292308	Average, Good, Poor, Very Good	1560	4	Indian Restaurant	Café	Pub	Restaurant	Women's Store
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In [45]:

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## Examine Clusters

## Cluster 5
New_Delhi_merged.loc[New_Delhi_merged['Cluster Labels'] == 4, New_Delhi_merged.columns[[1] + list(range(5, New_Delhi_merged.shape[1]))]]
```

Out[45]:

	Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
1	28.537063	3.292308	Average, Good, Poor, Very Good	1560	4	Indian Restaurant	Café	Pub	Restaurant	Women's Store
4	28.690020	3.033333	Average	126	4	Department Store	Indian Restaurant	Multiplex	Café	Fish & Ch Seafood
8	28.555599	3.800000	Average, Very Good	2411	4	Stadium	Café	Metro Station	Dessert Shop	Golf Course
9	28.659870	3.281481	Average, Good	1309	4	Café	Burger Joint	Burrito Place	Women's Store	Garden
16	28.630440	3.208333	Average, Good, Poor	1779	4	Bakery	Indian Restaurant	Café	Theater	Hotel
17	28.557846	3.220000	Average, Good, Poor	1875	4	Café	Coffee Shop	Pizza Place	Fast Food Restaurant	Chinese Restaurant
20	28.568193	2.755556	Average, Poor	339	4	Hotel	Lounge	Café	Nightclub	Breakfast Shop
21	28.589797	3.085714	Average, Good, Poor	1617	4	Café	African Restaurant	Park	Trail	Women's Store
27	28.716874	3.400000	Average	134	4	Department Store	Indian Restaurant	Shopping Mall	Café	Fast Food Restaurant
28	28.650254	3.166667	Average, Good	1217	4	Indian Restaurant	Fast Food Restaurant	Café	Pizza Place	Dessert Shop
30	28.561898	3.100000	Average, Good	1514	4	Café	Indian Restaurant	Diner	Grocery Store	Chinese Restaurant
31	28.632091	3.779832	Average, Excellent, Good, Very Good	128107	4	Indian Restaurant	Café	Chinese Restaurant	Bar	Coffee Shop
45	28.696802	3.296296	Average, Excellent, Good, Poor, Very Good	19479	4	Café	Pizza Place	Coffee Shop	Fast Food Restaurant	Chinese Restaurant
58	28.514237	4.200000	Very Good	1561	4	Asian Restaurant	Pub	Café	Restaurant	Coffee Shop
62	28.550319	3.701562	Average, Excellent, Good, Very Good	10511	4	Indian Restaurant	Market	Café	Pizza Place	Bisness

	Lat	Agg_Rating	Average, Comments, Excellent, Poor, Very Good	No_of_Votes	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
63	28.535531	3.553030	Good, Poor, Very Good	13894	4	Asian Restaurant	Asian Restaurant	Venue Café	Chinese Restaurant	Chinese Restaurant
64	28.538014	3.475000	Average, Good	369	4	Café	Restaurant	Convenience Store	Trail	Food Court
68	28.554275	3.845833	Average, Excellent, Good, Very Good	32573	4	Café	Indian Restaurant	Restaurant	Italian Restaurant	Italian Restaurant
75	28.569040	3.800000	Good, Very Good	1513	4	Lounge	Hotel	Café	Nightclub	Breakfast Shop
78	28.597665	3.733333	Average, Good, Very Good	3121	4	Indian Restaurant	Hotel	Café	Chinese Restaurant	Nightclub
79	28.631930	3.300000	Average, Good	168	4	Plaza	Udupi Restaurant	Café	Art Museum	Clothing Store
81	28.536611	3.380000	Average, Excellent	883	4	Café	Restaurant	Chinese Restaurant	Ice Cream Shop	Pizza Place
82	28.548371	3.137500	Average, Good, Poor	609	4	Café	Indian Restaurant	Airport Food Court	Shopping Mall	Clothing Store
86	28.624632	3.315217	Average, Excellent, Good, Poor, Very Good	4011	4	Café	Park	Bakery	Gym	Women's Store
89	28.539003	3.150000	Average, Good, Poor	893	4	Soccer Stadium	Café	Sandwich Place	Soccer Field	Pizza Place
91	28.556503	3.400000	Average, Good	346	4	Café	Coffee Shop	Pizza Place	Fast Food Restaurant	Chinese Restaurant
100	28.556869	4.500000	Excellent	524	4	Café	Indian Restaurant	Clothing Store	Nightclub	Bakery
102	28.600492	3.802326	Average, Excellent, Good, Very Good	28463	4	Café	Coffee Shop	Bar	Chinese Restaurant	Bookstore
108	28.563827	3.800000	Good, Very Good	1092	4	Market	Café	Indian Restaurant	Hotel	Fast Food Restaurant
114	28.584615	3.303571	Average, Good, Poor, Very Good	6480	4	Indian Restaurant	Flea Market	Tea Room	Restaurant	Bakery
120	28.673708	3.133333	Average	113	4	Asian Restaurant	Chinese Restaurant	Indian Restaurant	Hotel	Light Industrial Station
121	28.702381	3.100000	Average	36	4	Asian Restaurant	Hotel	Coffee Shop	Restaurant	Bus Station
123	28.626791	3.250000	Average	57	4	Theater	Bakery	Indian Restaurant	Café	Art Gallery
127	28.619410	3.134615	Average, Good, Poor	1648	4	Wings Joint	Ice Cream Shop	Juice Bar	Sandwich Place	Cafe
135	28.579641	3.180000	Average, Good	202	4	Pizza Place	Café	South Indian Restaurant	Arcade	Furniture Home Store

140	28.627959	3.004167	Average	326	4	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
Lat	Agg_Rating	Comments	No_of_Votes	Cluster Labels						
143	28.564494	3.140625	Average, Good, Very Good	1548	4	Café	Indian Restaurant	Sandwich Place	Italian Restaurant	Hotel
146	28.535040	3.175000	Average, Good	60	4	NaN	NaN	NaN	NaN	NaN
158	28.700027	3.157333	Average, Good, Poor	3974	4	Market	Indian Restaurant	Fast Food Restaurant	Snack Place	Diner
163	28.552711	3.100000	Average	7	4	Hotel	Indian Restaurant	Coffee Shop	Mughlai Restaurant	Gastropub
165	28.539464	2.900000	Average	14	4	Indian Restaurant	Restaurant	Moroccan Restaurant	Modern European Restaurant	Hotel
170	28.643757	3.575000	Average, Good	2879	4	Pizza Place	Fast Food Restaurant	Gym / Fitness Center	Coffee Shop	Bar
171	28.639604	3.056410	Average, Good, Poor, Very Good	5168	4	Pizza Place	Café	Food & Drink Shop	Gym / Fitness Center	Sandwich Place
174	28.550802	3.250000	Average, Good	34	4	Hotel	Indian Restaurant	Coffee Shop	Bakery	Punjabi Restaurant
175	28.546931	3.223077	Average, Good	606	4	Café	Indian Restaurant	Asian Restaurant	Beer Garden	Coffee Shop
179	28.572117	3.871429	Average, Good, Very Good	1871	4	Coffee Shop	Multiplex	Convenience Store	Shopping Mall	Cafe
181	28.571849	3.316667	Average, Good	472	4	Fast Food Restaurant	Pizza Place	Indian Restaurant	Snack Place	Women's Store
189	28.620715	3.880000	Average, Good, Very Good	626	4	Hotel	Indian Restaurant	Spa	Chinese Restaurant	Italian Restaurant
190	28.577107	3.100000	Average	114	4	Pizza Place	Café	Convenience Store	Gourmet Shop	Furniture Home Store
200	28.564288	3.200000	Average	6	4	Coffee Shop	Dessert Shop	Pub	Café	Airport Service
202	28.646593	3.280952	Average, Good, Very Good	1624	4	Indian Restaurant	BBQ Joint	Light Rail Station	Garden	Ice Cream Shop
206	28.538993	3.450000	Average, Good	242	4	Coffee Shop	Clothing Store	Fast Food Restaurant	Restaurant	Mexican Restaurant
207	28.625445	3.600000	Average, Good, Very Good	843	4	Hotel	Indian Restaurant	Italian Restaurant	Lounge	Coffee Shop
209	28.631362	3.537500	Average, Good	1666	4	Indian Restaurant	Bakery	Asian Restaurant	North Indian Restaurant	Hotel
213	28.623619	3.466667	Average, Good	1141	4	Hotel	Restaurant	Italian Restaurant	Spa	Mediterranean Restaurant
215	28.605069	3.785714	Average, Good, Very Good	1976	4	Chinese Restaurant	Japanese Restaurant	Indian Restaurant	Hotel Bar	Restaurant
226	28.525054	3.322222	Average, Good	1940	4	Dessert Shop	Chinese Restaurant	Pizza Place	Bar	Bar

228	28.596020	3.606452	Average, Excellent, Good	No_of_Votes	Cluster 4 Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
229	28.692519	3.606452	Average, Excellent, Good, Very Good	12271	4	Café	Snack Place	Asian Restaurant	Pizza Place	North Indian Restaurant
233	28.695096	3.050000	Average	86	4	NaN	NaN	NaN	NaN	NaN

## Conclusion

1. karol bagh, Kamla Nagar, Hauz Khas have the best South Indian resturant
2. Feroz Shah Road is the best place for the South Indian resturant follwed by Hauz Jhas Village and Janpath
3. Cannaugth Palace is the highest density resturant area
4. Greater kailash, Feroze shah road, Saket have best resturants in New Delhi.
5. Cluater-1 Shows that the most common venue is the 'Indian Resturant' so it is recommended for those who lives Indian reaturant
6. Cluster 2 is shows the most common venues are Hotel, Lounge, Indian Resturant etc
7. Cluster 4 It is most recommended for the Cafe and Bars
8. Cluster 5 It is most recommended for the Pizza Place