

```
In [3]: import pandas as pd
```

```
In [4]: df_data=pd.read_excel(r'C:\Users\sanjay_godiya\Desktop\MyDocs\DataScience\Lab_
data\BBMP_Ward_Master_2011.xlsx',
                                sheet_name='Sheet1')
```

```
In [5]: df_data.head(10)
```

Out[5]:

	Ward_Name	Population_density_(persons_per_sq_km)
0	Kempegowda Ward	3182
1	Chowdeswari Ward	5635
2	Atturu	6606
3	Yelahanka Satellite Town	9224
4	Jakkuru	2215
5	Thanisandra	7161
6	Byatarayanapura	7198
7	Kodigehalli	12369
8	Vidyaranyapura	5753
9	Dodda Bommasandra	8673

```
In [6]: df_data.shape
```

Out[6]: (198, 2)

```
In [7]: from geopy.geocoders import Nominatim # convert an address into latitude and l
ongitude values
import folium # map rendering library
```

```
In [8]: def getBlrData(ward_name,population_density):
    data=[]
    for name,density in zip (ward_name,population_density):
        row=[]
        address = name + ', Bangalore, India'
        geolocator = Nominatim(user_agent="ny_explorer")
        location = geolocator.geocode(address)
        if location is not None:
            lat = location.latitude
            long = location.longitude
            row.append(name)
            row.append(density)
            row.append(lat)
            row.append(long)
        data.append(row)
    return(data)
```

```
In [9]: df_data['Ward_Name']=df_data['Ward_Name'].str.replace('Ward','')
df_data.columns=df_data.columns.str.strip()
blr_data=getBlrData(ward_name=df_data['Ward_Name'],
                    population_density=df_data['Population_density_(persons_per_sq_km)'])
```

```
In [10]: Bangalore_df=pd.DataFrame(blr_data,columns=['Neighbourhood','Population_density_(persons_per_sq_km)','Latitude','Longitude'])
Bangalore_df.dropna(how='any',inplace=True)
Bangalore_df['Population_density_(persons_per_sq_km)']=Bangalore_df['Population_density_(persons_per_sq_km)'].astype(int)
Bangalore_df.head()
```

Out[10]:

	Neighbourhood	Population_density_(persons_per_sq_km)	Latitude	Longitude
0	Kempegowda	3182	13.109018	77.601900
1	Chowdeswari	5635	13.120459	77.579618
2	Atturu	6606	13.100409	77.858725
3	Yelahanka Satellite Town	9224	13.089139	77.582717
4	Jakkuru	2215	13.098320	77.625146

```
In [11]: Bangalore_df.shape
```

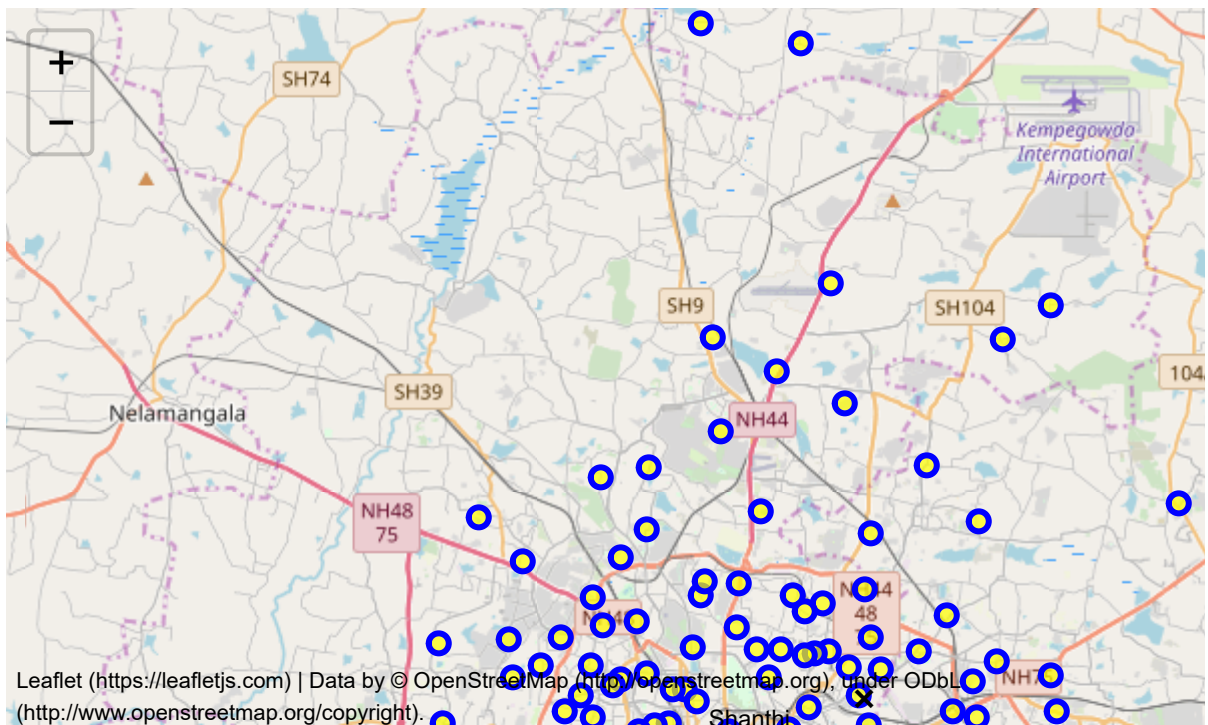
Out[11]: (168, 4)

```
In [12]: address = 'Bangalore, India'
geolocator = Nominatim(user_agent="ny_explorer")
location = geolocator.geocode(address)
blr_lat = location.latitude
blr_long = location.longitude
print('The geograpical coordinates of Bangalore are {}, {}'.format(blr_lat, blr_long))
```

The geograpical coordinates of Bangalore are 12.9791198, 77.5912997.

```
In [13]: import folium
map_blr = folium.Map(location=[blr_lat, blr_long], zoom_start=10)
# add markers to map
for lat, lng, label, density in zip(Bangalore_df['Latitude'], Bangalore_df['Longitude'], Bangalore_df['Neighbourhood'], Bangalore_df['Population_density_(persons_per_sq_km)']):
    label = folium.Popup(label+', '+ str(density), parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='yellow',
        fill_opacity=0.7,
        parse_html=False).add_to(map_blr)
map_blr
```

Out[13]:



## Defining Foursquare Credentials and Version

I will utilize the Foursquare API to explore the neighborhoods and segment them.

```
In [14]: CLIENT_ID = '2DQXYXWZHVQTGCZ5IUOZBKG5ISOK3YQD1TTA5H3L5LSZAHpz' #Foursquare ID
CLIENT_SECRET = 'CGB5ZQHLGAIPP3H45JNKLDJRBH5PCMZSDGKEHSQ0KZUKGKWL' #Foursquare Secret
VERSION = '20180605' # Foursquare API version
```

Creating a function to explore 100 venues at each loaction within 1000 radius

```

In [15]: import requests
LIMIT=500
def getNearbyVenues(names,densities,latitudes,longitudes,radius=2000):
    venues_list=[]
    for name,dens,lat,lng in zip(names,densities,latitudes,longitudes):

        # 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)

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

        # append only relevant information for each nearby venue
        venues_list.append([(name,dens,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 = ['Neighbourhood','Population_density_(persons_per_sq_km)','Latitude','Longitude',
        'Venue','Venue_Latitude','Venue_Longitude', 'Venue_Category']

    return(nearby_venues)

```

```
In [16]: blr_venues = getNearbyVenues(names=Bangalore_df['Neighbourhood'],densities=Ban  
galore_df['Population_density_(persons_per_sq_km)'],  
latitudes=Bangalore_df['Latitude'],longitudes=Ban  
galore_df['Longitude'])  
blr_venues
```

Out[16]:

	Neighbourhood	Population_density_(persons_per_sq_km)	Latitude	Longitude	Venue
0	Kempegowda	3182	13.109018	77.601900	Cafe Coffee Day
1	Kempegowda	3182	13.109018	77.601900	Cafe Coffee Day
2	Kempegowda	3182	13.109018	77.601900	Lifestyle
3	Kempegowda	3182	13.109018	77.601900	Cafe Coffee Day
4	Kempegowda	3182	13.109018	77.601900	Subway
5	Kempegowda	3182	13.109018	77.601900	Yelahanka Railway Station
6	Kempegowda	3182	13.109018	77.601900	Gokul Vegetarian
7	Kempegowda	3182	13.109018	77.601900	Gobi Adda
8	Kempegowda	3182	13.109018	77.601900	NES Bus Stop
9	Kempegowda	3182	13.109018	77.601900	RMZ Galleria Mall
10	Kempegowda	3182	13.109018	77.601900	Touche Golf School
11	Kempegowda	3182	13.109018	77.601900	Corner House
12	Kempegowda	3182	13.109018	77.601900	Tandoori Bites
13	Kempegowda	3182	13.109018	77.601900	New Udupi Veg
14	Chowdeswari	5635	13.120459	77.579618	Cafe Coffee Day
15	Chowdeswari	5635	13.120459	77.579618	BBC, NMIT
16	Chowdeswari	5635	13.120459	77.579618	Brewers @ NMIT Campus
17	Chowdeswari	5635	13.120459	77.579618	NMIT Park
18	Chowdeswari	5635	13.120459	77.579618	NMIT Grounds
19	Chowdeswari	5635	13.120459	77.579618	NMIT Bus yard
20	Chowdeswari	5635	13.120459	77.579618	The Szechuan
21	Atturu	6606	13.100409	77.858725	Hotel Pooja
22	Atturu	6606	13.100409	77.858725	Shere-E-Punjab dhaba

	Neighbourhood	Population_density_(persons_per_sq_km)	Latitude	Longitude	Venue
23	Atturu	6606	13.100409	77.858725	Nh 75 Restaurent
24	Atturu	6606	13.100409	77.858725	Arun Farms & Nursery
25	Atturu	6606	13.100409	77.858725	Ranch Out
26	Yelahanka Satellite Town	9224	13.089139	77.582717	Kanti Sweets
27	Yelahanka Satellite Town	9224	13.089139	77.582717	Cafe Coffee Day
28	Yelahanka Satellite Town	9224	13.089139	77.582717	Cafe Coffee Day
29	Yelahanka Satellite Town	9224	13.089139	77.582717	Lifestyle
...	...	...	...	...	...
8181	Vasanthpura	10852	12.912314	77.549154	Polar Bear
8182	Vasanthpura	10852	12.912314	77.549154	Maiya's Express
8183	Vasanthpura	10852	12.912314	77.549154	Domino's Pizza
8184	Vasanthpura	10852	12.912314	77.549154	cafe coffee day
8185	Vasanthpura	10852	12.912314	77.549154	Croma
8186	Vasanthpura	10852	12.912314	77.549154	Cafe Coffee Day
8187	Vasanthpura	10852	12.912314	77.549154	Kamakya theatre
8188	Vasanthpura	10852	12.912314	77.549154	Cake of the Day
8189	Vasanthpura	10852	12.912314	77.549154	Shanti Sagar
8190	Vasanthpura	10852	12.912314	77.549154	Goli Vadapav
8191	Vasanthpura	10852	12.912314	77.549154	Slv refreshment
8192	Vasanthpura	10852	12.912314	77.549154	Pizza Hut
8193	Vasanthpura	10852	12.912314	77.549154	Reliance Trends
8194	Vasanthpura	10852	12.912314	77.549154	Max
8195	Vasanthpura	10852	12.912314	77.549154	Megamarl
8196	Vasanthpura	10852	12.912314	77.549154	Shoprite Super Market
8197	Vasanthpura	10852	12.912314	77.549154	KFC

	Neighbourhood	Population_density_(persons_per_sq_km)	Latitude	Longitude	Venue
8198	Vasanthpura	10852	12.912314	77.549154	Tanishq
8199	Vasanthpura	10852	12.912314	77.549154	Cafe coffee day
8200	Vasanthpura	10852	12.912314	77.549154	Adyar Ananda Bhavan
8201	Vasanthpura	10852	12.912314	77.549154	Big Bazaar
8202	Vasanthpura	10852	12.912314	77.549154	Njac
8203	Vasanthpura	10852	12.912314	77.549154	Olive Era
8204	Vasanthpura	10852	12.912314	77.549154	Kubra Classic
8205	Vasanthpura	10852	12.912314	77.549154	Star Bazzar
8206	Vasanthpura	10852	12.912314	77.549154	Chai shop near bangalore airport
8207	Hemmigepura	1652	12.881929	77.485497	Axis Bank ATM
8208	Hemmigepura	1652	12.881929	77.485497	Axis Bank ATM
8209	Hemmigepura	1652	12.881929	77.485497	Clover Leaf
8210	Hemmigepura	1652	12.881929	77.485497	Food court, Royal Meenakshi Mall

8211 rows × 8 columns



```
In [17]: blr_venues['Venue_Category'].value_counts()
```

Out[17]:	Indian Restaurant	1348
	Café	492
	Fast Food Restaurant	376
	Ice Cream Shop	363
	Coffee Shop	294
	Pizza Place	280
	Chinese Restaurant	202
	Hotel	188
	Bakery	186
	Department Store	145
	Vegetarian / Vegan Restaurant	134
	Lounge	133
	Italian Restaurant	127
	Breakfast Spot	125
	Snack Place	114
	Restaurant	108
	Park	107
	Asian Restaurant	104
	Sandwich Place	104
	Clothing Store	101
	Shopping Mall	93
	Gym	88
	Brewery	87
	Dessert Shop	85
	Multiplex	83
	Pub	79
	Seafood Restaurant	75
	Juice Bar	71
	Donut Shop	71
	Tea Room	69
	...	
	Memorial Site	1
	Beer Bar	1
	Hotel Pool	1
	Farm	1
	Rest Area	1
	Modern European Restaurant	1
	Tibetan Restaurant	1
	Dhaba	1
	Tennis Stadium	1
	Roof Deck	1
	Dumpling Restaurant	1
	Design Studio	1
	Bus Stop	1
	Henan Restaurant	1
	Street Food Gathering	1
	Inn	1
	Currency Exchange	1
	Auto Workshop	1
	Hospital	1
	Mattress Store	1
	Auto Dealership	1
	Recreation Center	1
	Southern / Soul Food Restaurant	1
	Gourmet Shop	1
	Toll Plaza	1
	Dive Bar	1

Health Food Store	1
Taco Place	1
Stables	1
Frozen Yogurt Shop	1

Name: Venue\_Category, Length: 243, dtype: int64

```
In [44]: blr_restaurants=blr_venues[blr_venues['Venue_Category'].str.contains('Restaurant')]
blr_restaurants_grouped=blr_restaurants.groupby(['Neighbourhood', 'Venue_Category', 'Population_density_(persons_per_sq_km)'])[['Venue_Category']].count()
```

```
In [45]: blr_restaurants_grouped=blr_restaurants_grouped.add_suffix('_Count').reset_index()  
blr_restaurants_grouped
```

Out[45]:

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
0	A Narayanapura	Asian Restaurant	20286	
1	A Narayanapura	Fast Food Restaurant	20286	
2	A Narayanapura	Indian Restaurant	20286	
3	A Narayanapura	Italian Restaurant	20286	
4	A Narayanapura	Mexican Restaurant	20286	
5	A Narayanapura	New American Restaurant	20286	
6	Adugodi	Andhra Restaurant	21559	
7	Adugodi	Asian Restaurant	21559	
8	Adugodi	Chinese Restaurant	21559	
9	Adugodi	Fast Food Restaurant	21559	
10	Adugodi	Halal Restaurant	21559	
11	Adugodi	Indian Restaurant	21559	
12	Adugodi	Italian Restaurant	21559	
13	Adugodi	Karnataka Restaurant	21559	
14	Adugodi	Kerala Restaurant	21559	
15	Adugodi	Middle Eastern Restaurant	21559	
16	Adugodi	Southern / Soul Food Restaurant	21559	
17	Adugodi	Thai Restaurant	21559	
18	Agaram	Asian Restaurant	3345	
19	Agaram	Chinese Restaurant	3345	
20	Agaram	Fast Food Restaurant	3345	
21	Agaram	Indian Restaurant	3345	
22	Agaram	Italian Restaurant	3345	
23	Agaram	Korean Restaurant	3345	
24	Agaram	Mexican Restaurant	3345	
25	Agaram	Middle Eastern Restaurant	3345	
26	Agaram	Restaurant	3345	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
27	Agaram	Seafood Restaurant	3345	
28	Agaram	South Indian Restaurant	3345	
29	Agaram	Vegetarian / Vegan Restaurant	3345	
...	...	...	...	
1101	Vishveshwara Puram	Japanese Restaurant	13186	
1102	Vishveshwara Puram	Restaurant	13186	
1103	Vishveshwara Puram	South Indian Restaurant	13186	
1104	Vishveshwara Puram	Vegetarian / Vegan Restaurant	13186	
1105	Vishwanath Nagenahalli	Chinese Restaurant	34772	
1106	Vishwanath Nagenahalli	Fast Food Restaurant	34772	
1107	Vishwanath Nagenahalli	Indian Restaurant	34772	
1108	Vishwanath Nagenahalli	Punjabi Restaurant	34772	
1109	Vishwanath Nagenahalli	Vegetarian / Vegan Restaurant	34772	
1110	Yelahanka Satellite Town	American Restaurant	9224	
1111	Yelahanka Satellite Town	Indian Restaurant	9224	
1112	Yelahanka Satellite Town	South Indian Restaurant	9224	
1113	Yelchenahalli	Chinese Restaurant	29234	
1114	Yelchenahalli	Indian Restaurant	29234	
1115	Yelchenahalli	Seafood Restaurant	29234	
1116	Yelchenahalli	South Indian Restaurant	29234	
1117	Yelchenahalli	Vegetarian / Vegan Restaurant	29234	
1118	Yeshwanthpura	Asian Restaurant	53039	
1119	Yeshwanthpura	Chinese Restaurant	53039	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
1120	Yeshwanthpura	Fast Food Restaurant	53039	
1121	Yeshwanthpura	French Restaurant	53039	
1122	Yeshwanthpura	German Restaurant	53039	
1123	Yeshwanthpura	Indian Restaurant	53039	
1124	Yeshwanthpura	Italian Restaurant	53039	
1125	Yeshwanthpura	Mediterranean Restaurant	53039	
1126	Yeshwanthpura	Mexican Restaurant	53039	
1127	Yeshwanthpura	Restaurant	53039	
1128	Yeshwanthpura	Seafood Restaurant	53039	
1129	Yeshwanthpura	Thai Restaurant	53039	
1130	Yeshwanthpura	Vegetarian / Vegan Restaurant	53039	

1131 rows × 4 columns

```
In [46]: blr_restaurants_grouped.sort_values(by=['Population_density_(persons_per_sq_k  
m)'],ascending=False)
```



Out[46]:

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
789	Padarayanapura	Indian Restaurant	118059	
788	Padarayanapura	Fast Food Restaurant	118059	
767	Nilasandra	Fast Food Restaurant	94287	
768	Nilasandra	Indian Restaurant	94287	
776	Nilasandra	Seafood Restaurant	94287	
774	Nilasandra	Persian Restaurant	94287	
773	Nilasandra	Middle Eastern Restaurant	94287	
772	Nilasandra	Mexican Restaurant	94287	
771	Nilasandra	Mediterranean Restaurant	94287	
770	Nilasandra	Kerala Restaurant	94287	
769	Nilasandra	Italian Restaurant	94287	
775	Nilasandra	Punjabi Restaurant	94287	
766	Nilasandra	Chinese Restaurant	94287	
968	Shivaji Nagar	Japanese Restaurant	87856	
965	Shivaji Nagar	Hyderabadi Restaurant	87856	
958	Shivaji Nagar	Afghan Restaurant	87856	
959	Shivaji Nagar	American Restaurant	87856	
960	Shivaji Nagar	Andhra Restaurant	87856	
961	Shivaji Nagar	Chinese Restaurant	87856	
962	Shivaji Nagar	Eastern European Restaurant	87856	
963	Shivaji Nagar	Fast Food Restaurant	87856	
964	Shivaji Nagar	French Restaurant	87856	
972	Shivaji Nagar	South Indian Restaurant	87856	
971	Shivaji Nagar	Seafood Restaurant	87856	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
970	Shivaji Nagar	Pakistani Restaurant	87856	
969	Shivaji Nagar	Middle Eastern Restaurant	87856	
967	Shivaji Nagar	Italian Restaurant	87856	
966	Shivaji Nagar	Indian Restaurant	87856	
864	Rayapuram	Fast Food Restaurant	81770	
865	Rayapuram	Indian Restaurant	81770	
...	...	...	...	
429	Hudi	Karnataka Restaurant	3349	
19	Agaram	Chinese Restaurant	3345	
20	Agaram	Fast Food Restaurant	3345	
21	Agaram	Indian Restaurant	3345	
29	Agaram	Vegetarian / Vegan Restaurant	3345	
23	Agaram	Korean Restaurant	3345	
27	Agaram	Seafood Restaurant	3345	
26	Agaram	Restaurant	3345	
25	Agaram	Middle Eastern Restaurant	3345	
18	Agaram	Asian Restaurant	3345	
24	Agaram	Mexican Restaurant	3345	
28	Agaram	South Indian Restaurant	3345	
22	Agaram	Italian Restaurant	3345	
594	Kempegowda	American Restaurant	3182	
595	Kempegowda	Indian Restaurant	3182	
596	Kempegowda	South Indian Restaurant	3182	
597	Kempegowda	Vegetarian / Vegan Restaurant	3182	
129	Bellanduru	Tex-Mex Restaurant	3041	
128	Bellanduru	Punjabi Restaurant	3041	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
126	Bellanduru	Kerala Restaurant	3041	
127	Bellanduru	North Indian Restaurant	3041	
125	Bellanduru	Italian Restaurant	3041	
124	Bellanduru	Indian Restaurant	3041	
123	Bellanduru	Fast Food Restaurant	3041	
122	Bellanduru	Eastern European Restaurant	3041	
121	Bellanduru	Asian Restaurant	3041	
120	Bellanduru	American Restaurant	3041	
119	Bellanduru	Afghan Restaurant	3041	
443	Jakkuru	Indian Restaurant	2215	
1053	Varthur	Indian Restaurant	1929	

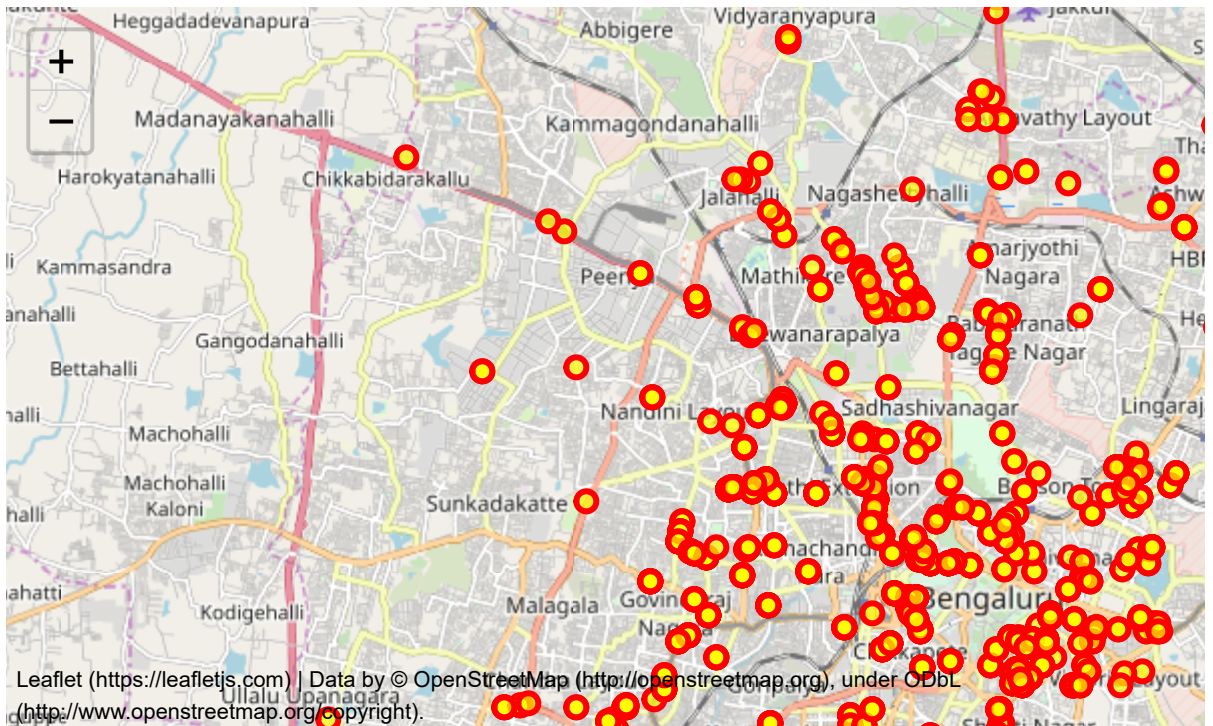
1131 rows × 4 columns

```

In [47]: #Plotting Bangalore Restaurants
map_blr_venues = folium.Map(location=[blr_lat, blr_long], zoom_start=10)
# add markers to map
for lat, lng, label, neigh in zip(blr_restaurants['Venue_Latitude'], blr_restau
rants['Venue_Longitude'],
                                blr_restaurants['Venue_Category'],
                                blr_restaurants['Neighbourhood']):
    label = folium.Popup(label+', '+neigh, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='red',
        fill=True,
        fill_color='yellow',
        fill_opacity=0.7,
        parse_html=False).add_to(map_blr_venues)
map_blr_venues

```

Out[47]:



```
In [98]: #Top 10 most dens areas of Bangalore
top10_dens=Bangalore_df[['Neighbourhood','Population_density_(persons_per_sq_k
m)']].sort_values(by='Population_density_(persons_per_sq_km)',ascending=False)
.head(10)
top10_dens
```

Out[98]:

	Neighbourhood	Population_density_(persons_per_sq_km)
134	Padarayanapura	118059
121	Kempapura Agrahara	113291
115	Nilasandra	94287
91	Shivaji Nagar	87856
136	Rayapuram	81770
96	Dayananda Nagar	80035
47	Muneshwara Nagar	74511
133	Bapuji Nagar	72549
170	Gurappana Palya	72068
29	Kadugondanahalli	65514

```
In [99]: #Top 10 Least dens areas of Bangalore
least10_dens=Bangalore_df[['Neighbourhood','Population_density_(persons_per_sq
_km)']].sort_values(by='Population_density_(persons_per_sq_km)',ascending=True)
.head(10)
least10_dens
```

Out[99]:

	Neighbourhood	Population_density_(persons_per_sq_km)
197	Hemmigepura	1652
148	Varthur	1929
4	Jakkuru	2215
149	Bellanduru	3041
0	Kempegowda	3182
113	Agaram	3345
53	Hudi	3349
82	Kadugodi	3934
195	Anjanapura	3997
83	Hagadur	4003

```
In [120]: #Top 10 most dens areas with restaurants counts  
blr_restaurants_grouped[blr_restaurants_grouped.Neighbourhood.isin(top10_dens[  
    'Neighbourhood'].tolist())].sort_values(by='Population_density_(persons_per_sq  
    _km)',ascending=False)
```

Out[120]:

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category
788	Padarayanapura	Fast Food Restaurant	118059	
789	Padarayanapura	Indian Restaurant	118059	
773	Nilasandra	Middle Eastern Restaurant	94287	
766	Nilasandra	Chinese Restaurant	94287	
767	Nilasandra	Fast Food Restaurant	94287	
768	Nilasandra	Indian Restaurant	94287	
769	Nilasandra	Italian Restaurant	94287	
770	Nilasandra	Kerala Restaurant	94287	
771	Nilasandra	Mediterranean Restaurant	94287	
772	Nilasandra	Mexican Restaurant	94287	
774	Nilasandra	Persian Restaurant	94287	
775	Nilasandra	Punjabi Restaurant	94287	
776	Nilasandra	Seafood Restaurant	94287	
959	Shivaji Nagar	American Restaurant	87856	
961	Shivaji Nagar	Chinese Restaurant	87856	
972	Shivaji Nagar	South Indian Restaurant	87856	
958	Shivaji Nagar	Afghan Restaurant	87856	
963	Shivaji Nagar	Fast Food Restaurant	87856	
962	Shivaji Nagar	Eastern European Restaurant	87856	
960	Shivaji Nagar	Andhra Restaurant	87856	
964	Shivaji Nagar	French Restaurant	87856	
966	Shivaji Nagar	Indian Restaurant	87856	
971	Shivaji Nagar	Seafood Restaurant	87856	
967	Shivaji Nagar	Italian Restaurant	87856	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category
968	Shivaji Nagar	Japanese Restaurant	87856	
969	Shivaji Nagar	Middle Eastern Restaurant	87856	
970	Shivaji Nagar	Pakistani Restaurant	87856	
965	Shivaji Nagar	Hyderabadi Restaurant	87856	
865	Rayapuram	Indian Restaurant	81770	
864	Rayapuram	Fast Food Restaurant	81770	
...	...	...	...	
100	Bapuji Nagar	Restaurant	72549	
101	Bapuji Nagar	Seafood Restaurant	72549	
99	Bapuji Nagar	Indian Restaurant	72549	
323	Gurappana Palya	Middle Eastern Restaurant	72068	
327	Gurappana Palya	South Indian Restaurant	72068	
320	Gurappana Palya	Italian Restaurant	72068	
321	Gurappana Palya	Mediterranean Restaurant	72068	
322	Gurappana Palya	Mexican Restaurant	72068	
324	Gurappana Palya	Punjabi Restaurant	72068	
325	Gurappana Palya	Rajasthani Restaurant	72068	
326	Gurappana Palya	Restaurant	72068	
328	Gurappana Palya	Vegetarian / Vegan Restaurant	72068	
318	Gurappana Palya	Halal Restaurant	72068	
317	Gurappana Palya	Fast Food Restaurant	72068	
316	Gurappana Palya	Dim Sum Restaurant	72068	
315	Gurappana Palya	Comfort Food Restaurant	72068	
314	Gurappana Palya	Chinese Restaurant	72068	
313	Gurappana Palya	Asian Restaurant	72068	
312	Gurappana Palya	Andhra Restaurant	72068	



	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category
319	Gurappana Palya	Indian Restaurant	72068	
570	Kadugondanahalli	South Indian Restaurant	65514	
561	Kadugondanahalli	Andhra Restaurant	65514	
562	Kadugondanahalli	Chinese Restaurant	65514	
563	Kadugondanahalli	Fast Food Restaurant	65514	
564	Kadugondanahalli	Indian Restaurant	65514	
565	Kadugondanahalli	Kerala Restaurant	65514	
566	Kadugondanahalli	Korean Restaurant	65514	
567	Kadugondanahalli	Mediterranean Restaurant	65514	
568	Kadugondanahalli	Middle Eastern Restaurant	65514	
569	Kadugondanahalli	Pakistani Restaurant	65514	

78 rows × 4 columns

```
In [121]: #Top 10 Least dens areas with restaurants counts  
blr_restaurants_grouped[blr_restaurants_grouped.Neighbourhood.isin(least10_den  
s['Neighbourhood'].tolist())].sort_values(by='Population_density_(persons_per_  
sq_km)',ascending=True)
```

Out[121]:

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
1053	Varthur	Indian Restaurant	1929	
443	Jakkuru	Indian Restaurant	2215	
129	Bellanduru	Tex-Mex Restaurant	3041	
127	Bellanduru	North Indian Restaurant	3041	
126	Bellanduru	Kerala Restaurant	3041	
125	Bellanduru	Italian Restaurant	3041	
124	Bellanduru	Indian Restaurant	3041	
123	Bellanduru	Fast Food Restaurant	3041	
122	Bellanduru	Eastern European Restaurant	3041	
121	Bellanduru	Asian Restaurant	3041	
120	Bellanduru	American Restaurant	3041	
119	Bellanduru	Afghan Restaurant	3041	
128	Bellanduru	Punjabi Restaurant	3041	
596	Kempegowda	South Indian Restaurant	3182	
595	Kempegowda	Indian Restaurant	3182	
594	Kempegowda	American Restaurant	3182	
597	Kempegowda	Vegetarian / Vegan Restaurant	3182	
28	Agaram	South Indian Restaurant	3345	
19	Agaram	Chinese Restaurant	3345	
29	Agaram	Vegetarian / Vegan Restaurant	3345	
20	Agaram	Fast Food Restaurant	3345	
18	Agaram	Asian Restaurant	3345	
22	Agaram	Italian Restaurant	3345	
27	Agaram	Seafood Restaurant	3345	
26	Agaram	Restaurant	3345	

	Neighbourhood	Venue_Category	Population_density_(persons_per_sq_km)	Venue_Category.
25	Agaram	Middle Eastern Restaurant	3345	
23	Agaram	Korean Restaurant	3345	
24	Agaram	Mexican Restaurant	3345	
21	Agaram	Indian Restaurant	3345	
429	Hudi	Karnataka Restaurant	3349	
560	Kadugodi	Vegetarian / Vegan Restaurant	3934	
559	Kadugodi	Fast Food Restaurant	3934	
558	Kadugodi	Asian Restaurant	3934	
373	Hagadur	Restaurant	4003	
371	Hagadur	Kerala Restaurant	4003	
370	Hagadur	Italian Restaurant	4003	
369	Hagadur	Indian Restaurant	4003	
367	Hagadur	Eastern European Restaurant	4003	
366	Hagadur	Chinese Restaurant	4003	
365	Hagadur	Asian Restaurant	4003	
364	Hagadur	American Restaurant	4003	
372	Hagadur	Rajasthani Restaurant	4003	
368	Hagadur	Fast Food Restaurant	4003	