June 7, 2024

1 Geographical_Analysis_of_restaurants_in_dataset_Cognifyz_Task4

[3]:
```
# Import Libraries
import pandas as pd
import matplotlib.pyplot as plt
import folium
```

[5]:
```
import warnings
warnings.filterwarnings("ignore")
```

[7]:
```
# Creating the Dataframe
file_path = r'D:\Software\New Project\Internship\Cognifyz\Predict Restaurant␣
 ↪Ratings\Dataset .csv'
df = pd.read_csv(file_path)
df.head(5)
```

[7]:

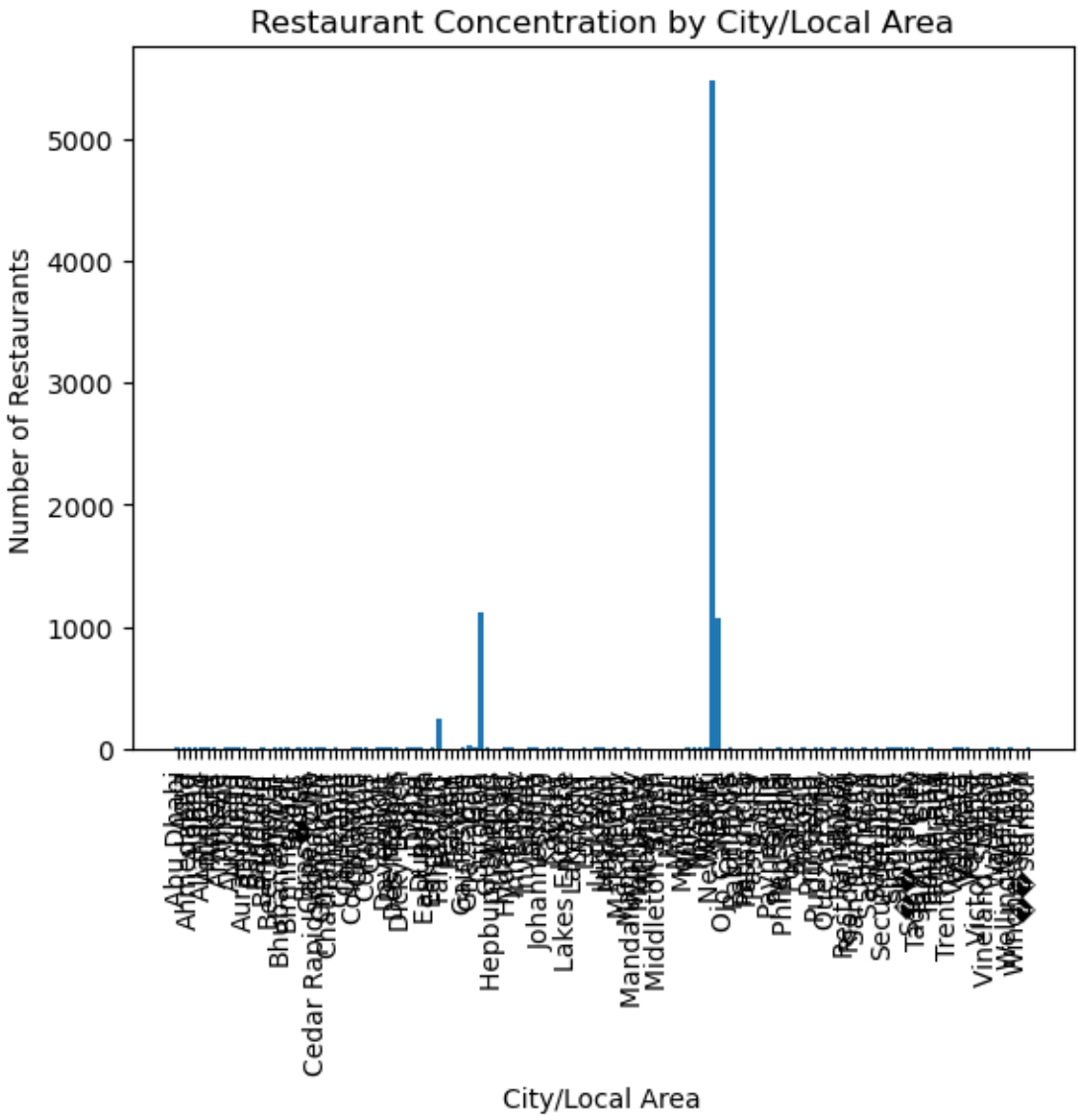
	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu…	Century City Mall, Poblacion, Makati City
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi…	Little Tokyo, Legaspi Village, Makati City
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong City	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal…	Edsa Shangri-La, Ortigas, Mandaluyong City
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O…	SM Megamall, Ortigas, Mandaluyong City
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas…	SM Megamall, Ortigas, Mandaluyong City

```
                                    Locality Verbose   Longitude   Latitude  \
0  Century City Mall, Poblacion, Makati City, Mak…  121.027535  14.565443
1  Little Tokyo, Legaspi Village, Makati City, Ma…  121.014101  14.553708
2  Edsa Shangri-La, Ortigas, Mandaluyong City, Ma…  121.056831  14.581404
3  SM Megamall, Ortigas, Mandaluyong City, Mandal…  121.056475  14.585318
4  SM Megamall, Ortigas, Mandaluyong City, Mandal…  121.057508  14.584450

                          Cuisines  …          Currency Has Table booking  \
0       French, Japanese, Desserts  …  Botswana Pula(P)               Yes
1                         Japanese  …  Botswana Pula(P)               Yes
2  Seafood, Asian, Filipino, Indian  …  Botswana Pula(P)               Yes
3                   Japanese, Sushi  …  Botswana Pula(P)                No
4                  Japanese, Korean  …  Botswana Pula(P)               Yes

  Has Online delivery Is delivering now Switch to order menu Price range  \
0                  No                 No                     No           3
1                  No                 No                     No           3
2                  No                 No                     No           4
3                  No                 No                     No           4
4                  No                 No                     No           4

   Aggregate rating  Rating color Rating text Votes
0               4.8    Dark Green   Excellent   314
1               4.5    Dark Green   Excellent   591
2               4.4         Green   Very Good   270
3               4.9    Dark Green   Excellent   365
4               4.8    Dark Green   Excellent   229

[5 rows x 21 columns]
```

[8]:
```
# Using Group by function, grouping the City Column
grouped_by_city = df.groupby('City')
```

[9]:
```
# Count of Restaurant
restaurant_count = grouped_by_city['Restaurant Name'].count()
```

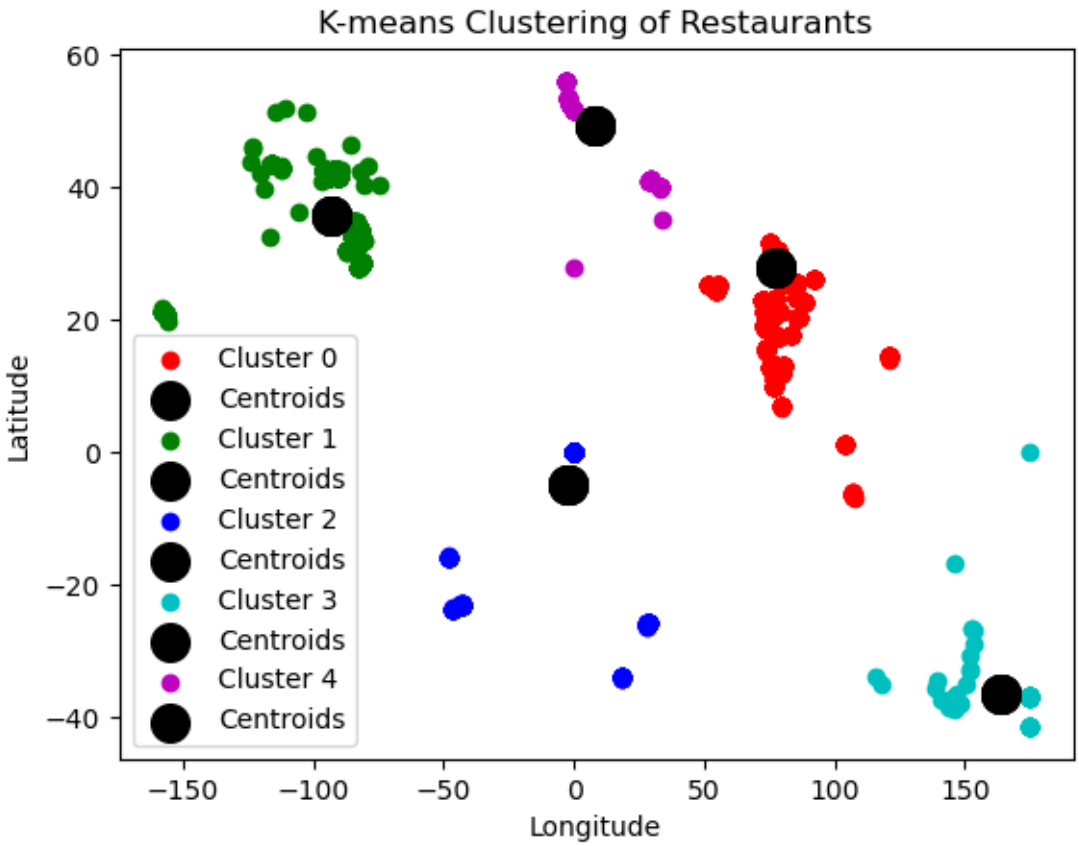
[10]:
```
import matplotlib.pyplot as plt

plt.bar(restaurant_count.index, restaurant_count.values)
plt.xlabel('City/Local Area')
plt.ylabel('Number of Restaurants')
plt.title('Restaurant Concentration by City/Local Area')
plt.xticks(rotation=90)
plt.show()
```



[11]:
```
# Forming into Clusters
from sklearn.cluster import KMeans

X = df[['Latitude', 'Longitude']]
k = 5
kmeans = KMeans(n_clusters=k, random_state=0)
cluster_labels = kmeans.fit_predict(X)
df['Cluster'] = cluster_labels
```

[12]:
```
colors = ['r', 'g', 'b', 'c', 'm', 'y', 'k']

for cluster_num in range(k):
```

```
    cluster_data = df[df['Cluster'] == cluster_num]
    plt.scatter(cluster_data['Longitude'], cluster_data['Latitude'],
                c=colors[cluster_num], label=f'Cluster {cluster_num}')
    plt.scatter(kmeans.cluster_centers_[:, 1], kmeans.cluster_centers_[:, 0],
                s=200, c='black', label='Centroids')
    plt.xlabel('Longitude')
    plt.ylabel('Latitude')
    plt.title('K-means Clustering of Restaurants')
    plt.legend()
plt.show()
```



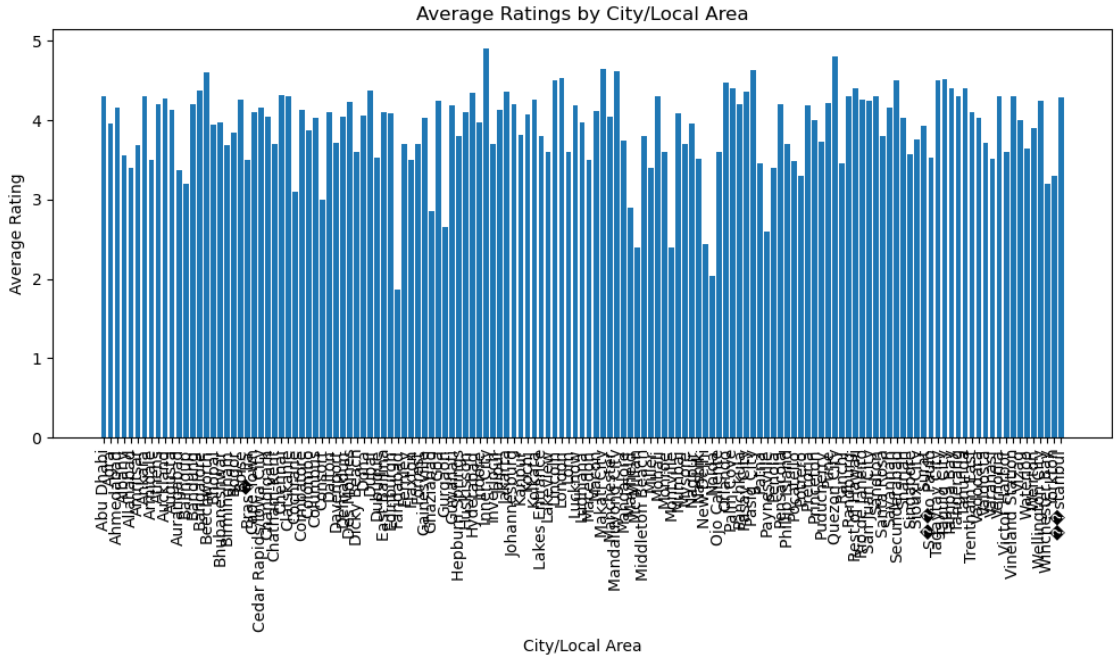
1.0.1 Average Ratings by City/Locality

[13]:
```
average_ratings_by_city = grouped_by_city['Aggregate rating'].mean()
print(average_ratings_by_city)
```

```
City
Abu Dhabi          4.300000
Agra               3.965000
Ahmedabad          4.161905
```

```
Albany              3.555000
Allahabad           3.395000
                       …
Weirton             3.900000
Wellington City     4.250000
Winchester Bay      3.200000
Yorkton             3.300000
 stanbul            4.292857
Name: Aggregate rating, Length: 141, dtype: float64
```

[15]:
```
plt.figure(figsize=(10, 6))

plt.bar(average_ratings_by_city.index, average_ratings_by_city.values)
plt.xlabel('City/Local Area')
plt.ylabel('Average Rating')
plt.title('Average Ratings by City/Local Area')
plt.xticks(rotation=90) # Rotate x-axis labels for better readability
plt.tight_layout()
plt.show()
```



1.0.2 Popular Cuisines by City/Locality

[16]:
```
popular_cuisines_by_city = grouped_by_city['Cuisines'].agg(lambda x: x.mode().
↪tolist())
print(popular_cuisines_by_city)
```

```
City
Abu Dhabi                              [American, Indian, Italian, Pizza]
Agra                                                  [North Indian, Mughlai]
Ahmedabad          [Cafe, American, Continental, Armenian, Fast F…
Albany                                              [Japanese, Steak, Sushi]
Allahabad                                            [North Indian, Chinese]
                                                  …
Weirton                                            [Burger, Greek, Sandwich]
Wellington City                                                       [Cafe]
Winchester Bay                                     [Burger, Seafood, Steak]
Yorkton                                                             [Asian]
 stanbul                                                            [Cafe]
Name: Cuisines, Length: 141, dtype: object
```

[17]:
```
plt.figure(figsize=(10, 6))

for city, cuisines in popular_cuisines_by_city.items():
    plt.bar(city, ', '.join(cuisines))
    plt.xlabel('City/Local Area')
    plt.ylabel('Popular Cuisines')
    plt.title('Popular Cuisines by City/Local Area')
    plt.xticks(rotation=90) # Rotate x-axis labels for better readability
    plt.tight_layout()

plt.show()
```

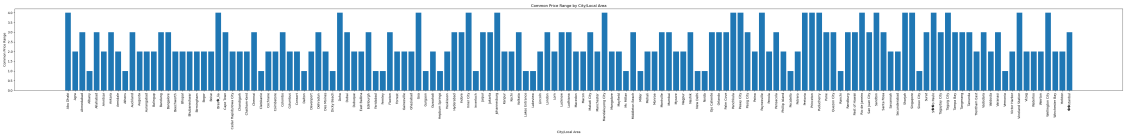
1.0.3 Price Range Analysis by City/Locality

[18]:
```
common_price_range_by_city = grouped_by_city['Price range'].agg(lambda x: x.
↪mode().iloc[0])
print(common_price_range_by_city)
```

```
City
Abu Dhabi          4
Agra               2
Ahmedabad          3
Albany             1
Allahabad          3
                  ..
Weirton            2
Wellington City    4
```

```
Winchester Bay     2
Yorkton            2
 stanbul           3
Name: Price range, Length: 141, dtype: int64
```

[19]:
```
plt.figure(figsize=(50, 6))

plt.bar(common_price_range_by_city.index, common_price_range_by_city.values)
plt.xlabel('City/Local Area')
plt.ylabel('Common Price Range')
plt.title('Common Price Range by City/Local Area')
plt.xticks(rotation=90)
plt.tight_layout()
plt.show()
```



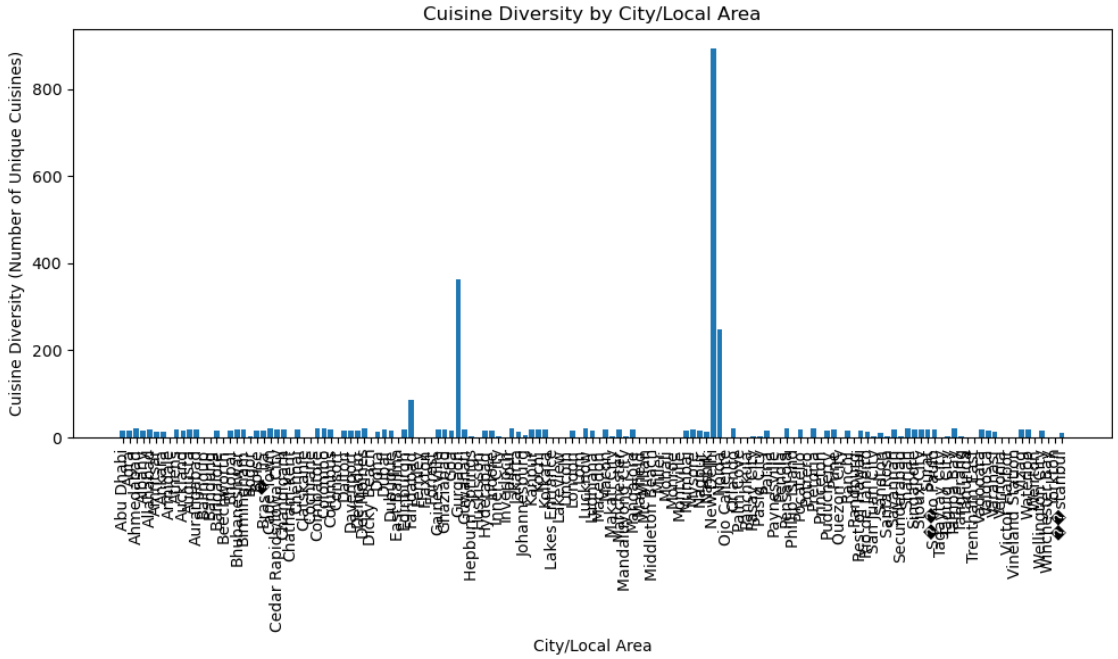
1.0.4 Cuisine Diversity

[20]:
```
grouped_by_city = df.groupby('City')
cuisine_diversity = grouped_by_city['Cuisines'].apply(lambda x: len(set(x)))
print(cuisine_diversity)
```

```
City
Abu Dhabi          17
Agra               15
Ahmedabad          21
Albany             17
Allahabad          18
                   ..
Weirton             1
Wellington City    17
Winchester Bay      1
Yorkton             1
 stanbul           11
Name: Cuisines, Length: 141, dtype: int64
```

[21]:
```
plt.figure(figsize=(10, 6))

plt.bar(cuisine_diversity.index, cuisine_diversity.values)
plt.xlabel('City/Local Area')
plt.ylabel('Cuisine Diversity (Number of Unique Cuisines)')
```

```
plt.title('Cuisine Diversity by City/Local Area')
plt.xticks(rotation=90)
plt.tight_layout()
plt.show()
```



1.0.5 Conclusion:

Performed a geographical analysis of the restaurants based on Average Ratings, Cuisine Ratings

1.1 THANK YOU!!!

1.2 Github Link: https://github.com/anujtiwari21?tab=repositories