Task3

Task: Geographic Analysis

1.Plot the locations of restaurants on a map using longitude and latitude coordinates

2.Identify any patterns or clusters of restaurants in specific areas.

In [2]:
```
# import library
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sb
```

In [3]:
```
df=pd.read_csv("C:\\Users\\abhis\\Downloads\\Dataset .csv")
df
```

Out[3]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose
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..
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..
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong City	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...	Edsa Shangri-La, Ortigas, Mandaluyong City	Edsa Shangri-La Ortigas Mandaluyong City, Ma..
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall Ortigas Mandaluyong City, Mandal..
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall Ortigas Mandaluyong City, Mandal..
...	...	...	...	...	...	...	..
9546	5915730	Naml Gurme	208	��stanbul	Kemanke�� Karamustafa Pa��a Mahallesi, Rlhtlm ...	Karak�_y	Karak�_y ��stanbu
9547	5908749	Ceviz A��acl	208	��stanbul	Ko��uyolu Mahallesi, Muhittin ��st�_nda�� Cadd...	Ko��uyolu	Ko��uyolu ��stanbu
9548	5915807	Huqqa	208	��stanbul	Kuru�_e��me Mahallesi, Muallim Naci Caddesi, N...	Kuru�_e��me	Kuru�_e��me ��stanbu
9549	5916112	A���k Kahve	208	��stanbul	Kuru�_e��me Mahallesi, Muallim Naci Caddesi, N...	Kuru�_e��me	Kuru�_e��me ��stanbu
9550	5927402	Walter's Coffee Roastery	208	��stanbul	Cafea��a Mahallesi, Bademaltl Sokak, No 21/B, ...	Moda	Moda ��stanbu

9551 rows × 21 columns

In [3]:
```
pip install folium
```

```
Defaulting to user installation because normal site-packages is not writeable
Collecting folium
  Obtaining dependency information for folium from https://files.pythonhosted.org/packages/18/09/8569904c8ce5679cc02826d98de633c07abcd2443a23181e5f71ff9dacbc/folium-0.15.1-py2.py3-none-any.whl.metadata
  Downloading folium-0.15.1-py2.py3-none-any.whl.metadata (3.4 kB)
Collecting branca>=0.6.0 (from folium)
  Obtaining dependency information for branca>=0.6.0 from https://files.pythonhosted.org/packages/2f/e7/603b136221de923055716d23e3047da71f92e0d8ba2c4517ce49a54fe768/branca-0.7.0-py3-none-any.whl.metadata
  Downloading branca-0.7.0-py3-none-any.whl.metadata (1.5 kB)
Requirement already satisfied: jinja2>=2.9 in e:\anaconda\lib\site-packages (from folium) (3.1.2)
Requirement already satisfied: numpy in e:\anaconda\lib\site-packages (from folium) (1.24.3)
Requirement already satisfied: requests in e:\anaconda\lib\site-packages (from folium) (2.31.0)
Requirement already satisfied: xyzservices in e:\anaconda\lib\site-packages (from folium) (2022.9.0)
Requirement already satisfied: MarkupSafe>=2.0 in e:\anaconda\lib\site-packages (from jinja2>=2.9->folium) (2.1.1)
Requirement already satisfied: charset-normalizer<4,>=2 in e:\anaconda\lib\site-packages (from requests->folium) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in e:\anaconda\lib\site-packages (from requests->folium) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in e:\anaconda\lib\site-packages (from requests->folium) (1.26.16)
Requirement already satisfied: certifi>=2017.4.17 in e:\anaconda\lib\site-packages (from requests->folium) (2023.7.22)
Downloading folium-0.15.1-py2.py3-none-any.whl (97 kB)
   ---------------------------------------- 0.0/97.0 kB ? eta -:--:--
   ---------------------------------------- -- 92.2/97.0 kB 5.5 MB/s eta 0:00:01
   ---------------------------------------- 97.0/97.0 kB 1.4 MB/s eta 0:00:00
Downloading branca-0.7.0-py3-none-any.whl (25 kB)
Installing collected packages: branca, folium
Successfully installed branca-0.7.0 folium-0.15.1
Note: you may need to restart the kernel to use updated packages.
```

In [4]:
```
rest_name = df["Restaurant Name"]
latitude = df["Latitude"]
longitude = df["Longitude"]
```

In [1]:
```
import folium
from IPython.display import display
from sklearn.cluster import KMeans
```

In [5]:
```
lat_log = df[["Latitude", "Longitude"]]
num_clusters = 10
```

In [8]:
```
kmeans = KMeans(n_clusters=num_clusters, random_state=100)
df["Cluster"] = kmeans.fit_predict(lat_log)
```

```
E:\anaconda\Lib\site-packages\sklearn\cluster\_kmeans.py:1412: FutureWarning: The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning
  super()._check_params_vs_input(X, default_n_init=10)
```

In [9]:
```
map_center = [latitude.mean(), longitude.mean()]
rest_map = folium.Map(location=map_center, zoom_start=15)
```

In [10]:
```
cluster_colors = ['red', 'blue', 'green', 'black', 'pink']
```

In [13]:
```
for index, row in df.iterrows():
    restaurant_name = row["Restaurant Name"]
    latitude = row["Latitude"]
    longitude = row["Longitude"]
    cuisines = row["Cuisines"]
    rating = row["Aggregate rating"]
    cluster = row["Cluster"]

    popup_text = f"Restaurant: {restaurant_name}\nCuisines: {cuisines}\nRating: {ratir
    marker = folium.Marker([latitude, longitude], popup=popup_text)
    marker.add_to(rest_map)
```

In [14]:
```
display(rest_map)
```

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

In [ ]:
```

```