level-2

June 28, 2024

[12]:

```
import pandas as pd # for the data manupulation
import numpy as np # for computations
import matplotlib.pyplot as plt # for visual graphs
import seaborn as sns
```

[13]:

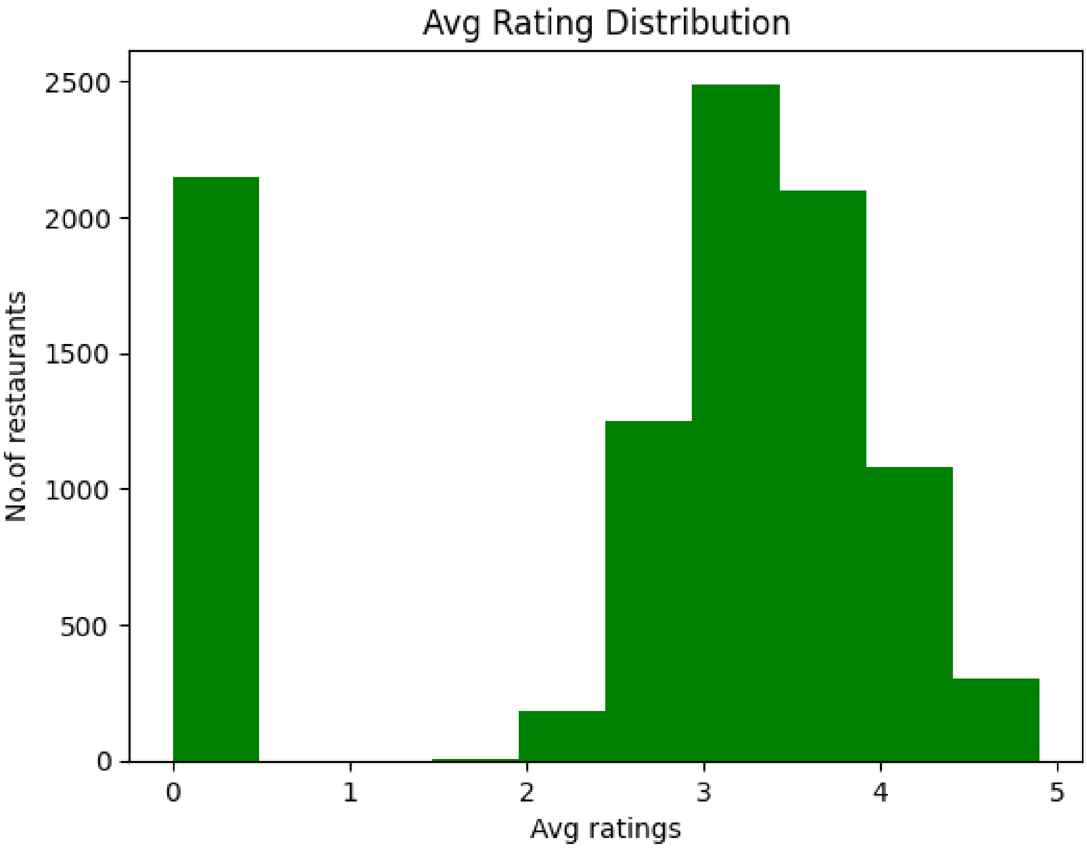
```
df1 = pd.read_csv("Dataset .csv")
```

1 Task 1

Restaurant Ratings 1. Analyze the distribution of aggregate ratings and determine the most commonrating range.

[14]:

```
plt.hist(df1['Aggregate rating'], bins = 10, color = 'green')
plt.xlabel('Avg ratings')
plt.ylabel('No.of restaurants')
plt.title('Avg Rating Distribution')
plt.show()
```



2. Calculate the average number of votes received by restaurants.

```
[15]: rating_counts = df1['Aggregate rating'].value_counts()
      print("The most avg rating is:",rating_counts.idxmax())
      print("The restaurants with the most avg rating were",rating_counts.max())
```

```
The most avg rating is: 0.0
The restaurants with the most avg rating were 2148
```

```
[16]: df1.columns
```

```
[16]: Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
             'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
             'Average Cost for two', 'Currency', 'Has Table booking',
             'Has Online delivery', 'Is delivering now', 'Switch to order menu',
             'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
             'Votes'],
            dtype='object')
```

[17]:

```
#Calculate the average number of votes received by restaurants.
Avg_votes = round(df1['Votes'].mean(), 2)
print("The Avg number of votes :",Avg_votes)
```

```
The Avg number of votes : 156.91
```

2 Task 2

Cuisine Combination 1. Identify the most common combinations of cuisines in the dataset.

[18]:

```
df1["Cuisines"].isna().sum()
```

[18]: 9

[19]:

```
# So first  drop the Na values
df1.dropna(subset=['Cuisines'], inplace=True)
```

[20]:

```
df1['Cuisines'] = df1['Cuisines'].apply(lambda x: sorted(x.strip().split(',')))
df1['Cuisines'] = df1['Cuisines'].apply(tuple)
```

[21]:

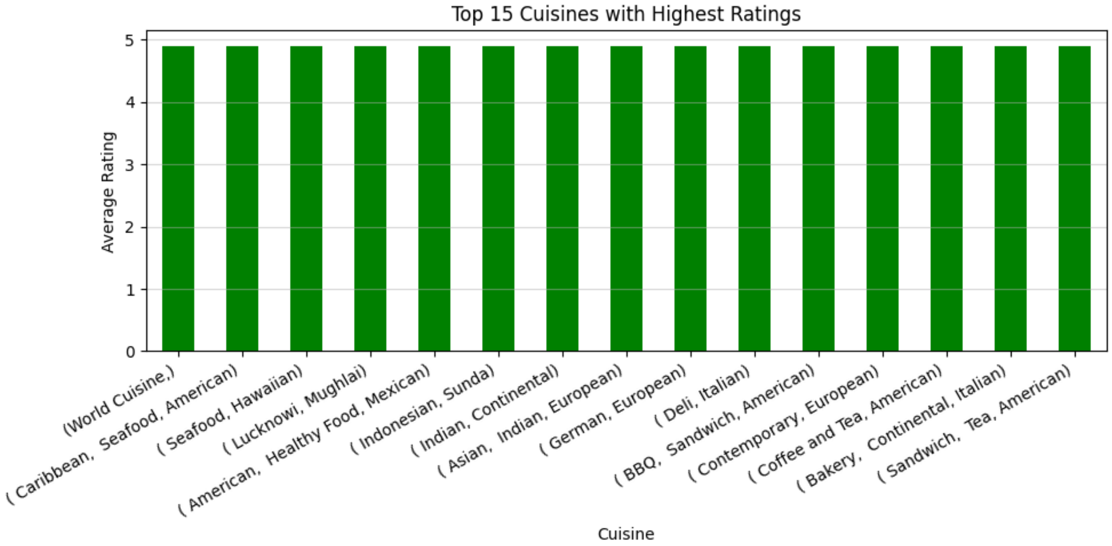
```
Avg_rating_by_combination =  df1.groupby('Cuisines')['Aggregate rating'].mean()
sorted_cuisines = Avg_rating_by_combination.sort_values(ascending=False)
print("Cuisines with Highest ratings:",sorted_cuisines.head(15))
```

```
Cuisines with Highest ratings: Cuisines
(World Cuisine,)                       4.9
( Caribbean,  Seafood, American)       4.9
( Seafood, Hawaiian)                   4.9
( Lucknowi, Mughlai)                   4.9
( American,  Healthy Food, Mexican)    4.9
( Indonesian, Sunda)                   4.9
( Indian, Continental)                 4.9
( Asian,  Indian, European)            4.9
( German, European)                    4.9
( Deli, Italian)                       4.9
( BBQ,  Sandwich, American)            4.9
( Contemporary, European)              4.9
( Coffee and Tea, American)            4.9
( Bakery,  Continental, Italian)       4.9
( Sandwich,  Tea, American)            4.9
Name: Aggregate rating, dtype: float64
```

2. Determine if certain cuisine combinations tend to have higher ratings.

[22]:

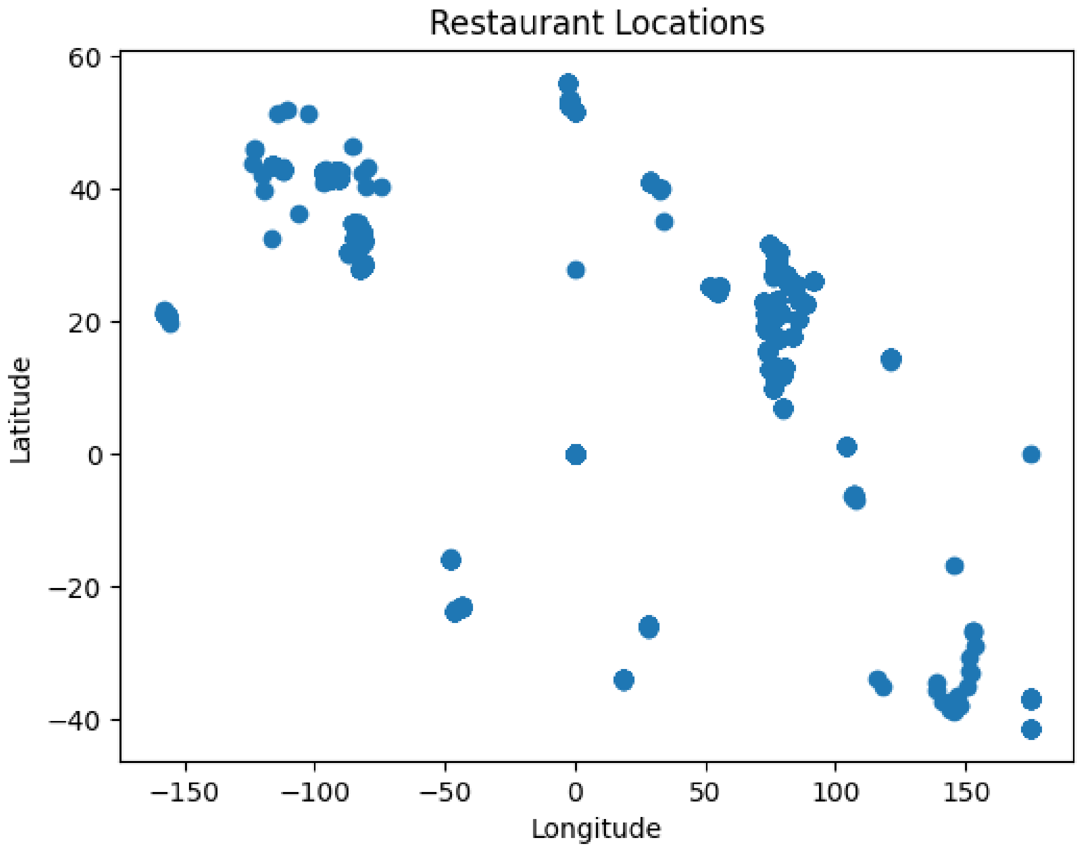
```
plt.figure(figsize=(10, 5))
sorted_cuisines.head(15).plot(kind='bar', color='green')
plt.title('Top 15 Cuisines with Highest Ratings')
plt.xlabel('Cuisine')
plt.ylabel('Average Rating')
plt.xticks(rotation=30, ha='right')  # Rotate x-axis labels for better␣
↪readability
plt.grid(axis='y', linestyle='-', alpha=0.5)
plt.tight_layout()
plt.show()
```



3 Task 3

Geographic Analysis 1. Plot the locations of restaurants on amap using longitude and latitude coordinates.

```
[23]: # Create a scatterplot
plt.scatter(x=df1['Longitude'], y=df1['Latitude'])
plt.xlabel("Longitude")
plt.ylabel("Latitude")
plt.title("Restaurant Locations")
plt.show()
```



[24]:
```
%pip install plotly
```

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: plotly in c:\users\nagap\appdata\local\packages\p
ythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in c:\users\nagap\appdata\local\p
ackages\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from plotly) (8.4.2)
Requirement already satisfied: packaging in c:\users\nagap\appdata\local\package
s\pythonsoftwarefoundation.python.3.12_qbz5n2kfra8p0\localcache\local-
packages\python312\site-packages (from plotly) (23.2)
Note: you may need to restart the kernel to use updated packages.


[notice] A new release of pip is available: 24.0 -> 24.1.1
[notice] To update, run: C:\Users\nagap\AppData\Local\Microsoft\WindowsApps\Pyth
onSoftwareFoundation.Python.3.12_qbz5n2kfra8p0\python.exe -m pip install
--upgrade pip
```

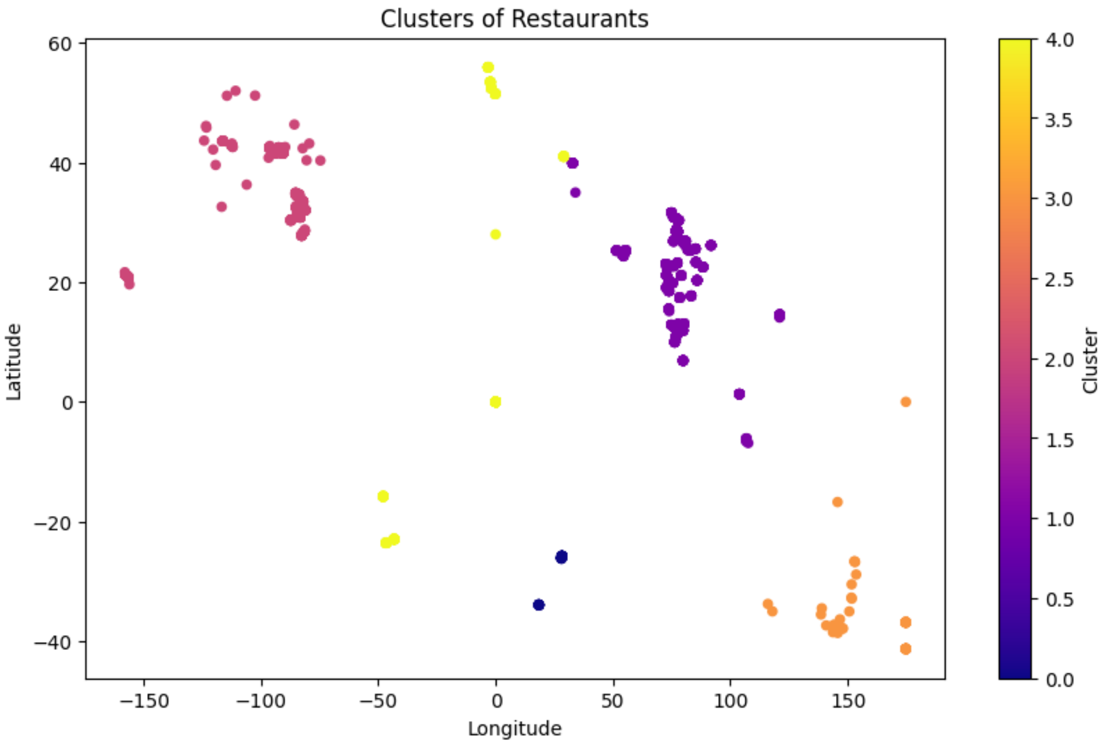
[26]:

```
import plotly.express as px

# Create a scatter map
fig = px.scatter_mapbox(df1,
                        lat="Latitude",
                        lon="Longitude",
                        hover_name="Restaurant Name",  # Customize hover info
                        zoom=5)  # Adjust the initial zoom level

# Customize the map layout
fig.update_layout(mapbox_style="open-street-map",
                  mapbox_center={"lat": df1["Latitude"].mean(), "lon":␣
 ↪df1["Longitude"].mean()},
                  title="Restaurant Locations")

# Show the map
fig.show()
```

2. Identify any patterns or clusters ofrestaurants in specific areas.

[35]:

```
from sklearn.cluster import KMeans
X = df1[['Latitude', 'Longitude']]
k = 5
kmeans = KMeans(n_clusters=k, random_state=45)
df1['cluster'] = kmeans.fit_predict(X)
plt.figure(figsize=(10, 6))
plt.scatter(df1['Longitude'], df1['Latitude'], c=df1['cluster'], cmap='plasma',␣
 ↪s=20)
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.title('Clusters of Restaurants')
plt.colorbar(label='Cluster')
plt.show()
```



4 Task 4

Restaurant Chains 1. Identify if there are any restaurant chains present in the dataset.

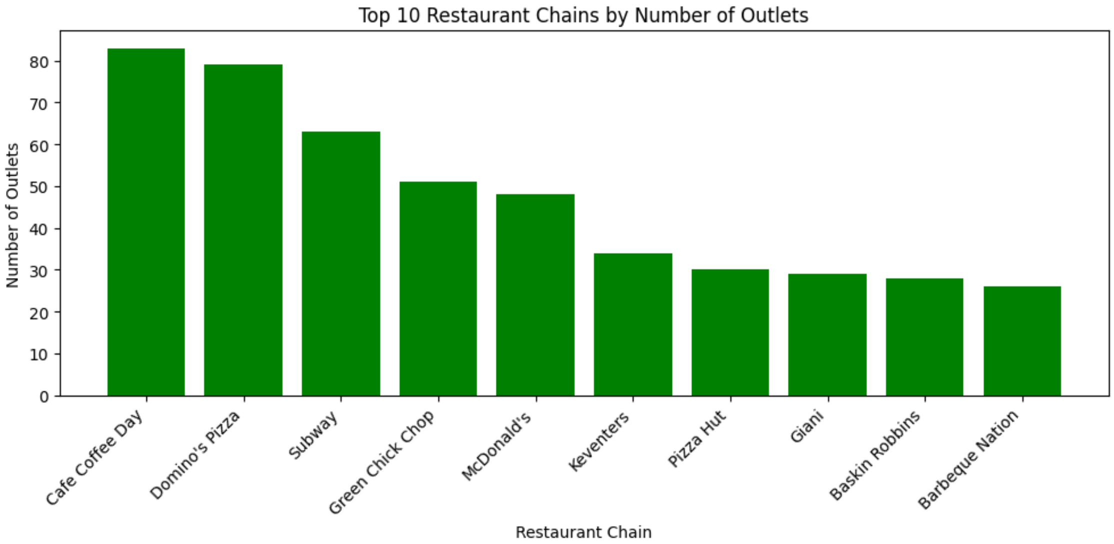
[36]:
```
rs_chains = df1.groupby("Restaurant Name").size().
  ↪reset_index(name="res_chain_count")
rs_chains = rs_chains[rs_chains["res_chain_count"] > 1]
chains_sorted = rs_chains.sort_values(by="res_chain_count", ascending=False)
```

[39]:
```
print(chains_sorted)
top_10 = chains_sorted.head(10)
```

```
       Restaurant Name  res_chain_count
1098    Cafe Coffee Day               83
2096     Domino's Pizza               79
6098             Subway               63
2713   Green Chick Chop               51
4070           McDonald's               48
…                   …              …
2767           Gullu's                2
2761              Gulab                2
2743      Grover Sweets                2
2736             Grillz                2
```

```
7423             bu no                2

[734 rows x 2 columns]
```

[51]:
```
plt.figure(figsize=(10, 5))
plt.bar(top_10["Restaurant Name"], top_10["res_chain_count"], color = 'green')
plt.xticks(rotation=45, ha='right')
plt.xlabel("Restaurant Chain")
plt.ylabel("Number of Outlets")
plt.title("Top 10 Restaurant Chains by Number of Outlets")
plt.tight_layout()
plt.show()
```



2. Analyze the ratings and popularity of different restaurant chains.

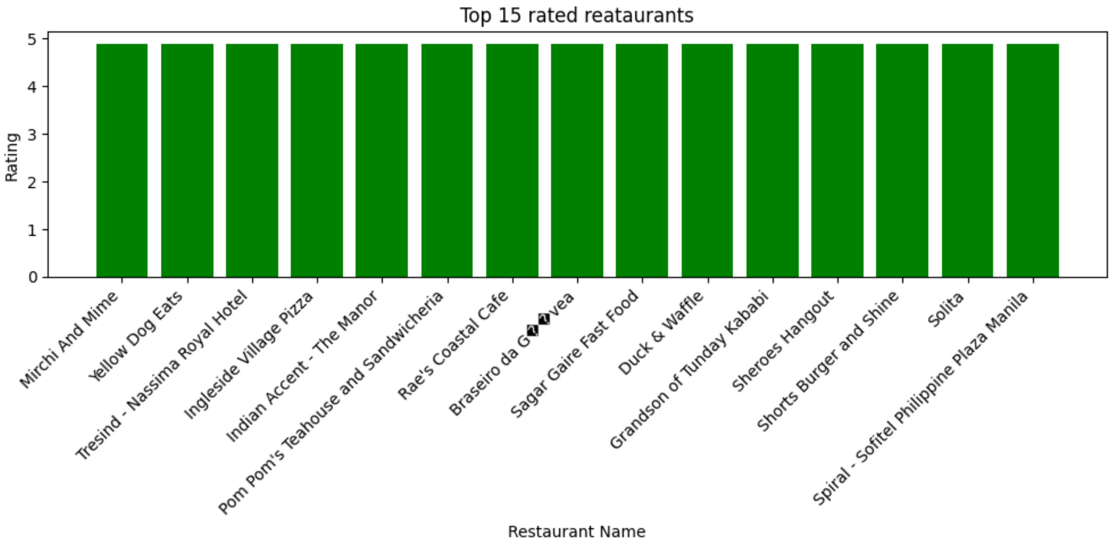
[52]:
```
ch_ratings = df1.groupby("Restaurant Name")["Aggregate rating"].mean().
 ↪reset_index(name="Avg Rating")
ch_votes = df1.groupby("Restaurant Name")["Votes"].sum().reset_index(name="vote␣
 ↪count")
```

[64]:
```
sort_rating = ch_ratings.sort_values(by ="Avg Rating", ascending=False)
top_15 = sort_rating.head(15)
top_15
```

[64]:
```
                              Restaurant Name  Avg Rating
4175                          Mirchi And Mime         4.9
7330                          Yellow Dog Eats         4.9
6970              Tresind - Nassima Royal Hotel         4.9
3140                   Ingleside Village Pizza         4.9
```

```
3110                  Indian Accent - The Manor         4.9
4987       Pom Pom's Teahouse and Sandwicheria         4.9
5179                         Rae's Coastal Cafe         4.9
945                          Braseiro da G vea         4.9
5469                      Sagar Gaire Fast Food         4.9
2130                               Duck & Waffle         4.9
2695                  Grandson of Tunday Kababi         4.9
5718                            Sheroes Hangout         4.9
5749                     Shorts Burger and Shine         4.9
5938                                      Solita         4.9
6037  Spiral - Sofitel Philippine Plaza Manila         4.9
```

[67]:
```
plt.figure(figsize=(10, 5))
plt.bar(top_15["Restaurant Name"], top_15["Avg Rating"], color = 'green')
plt.xticks(rotation=45, ha='right')
plt.xlabel("Restaurant Name")
plt.ylabel("Rating")
plt.title("Top 15 rated reataurants")
plt.tight_layout()
plt.show()
```



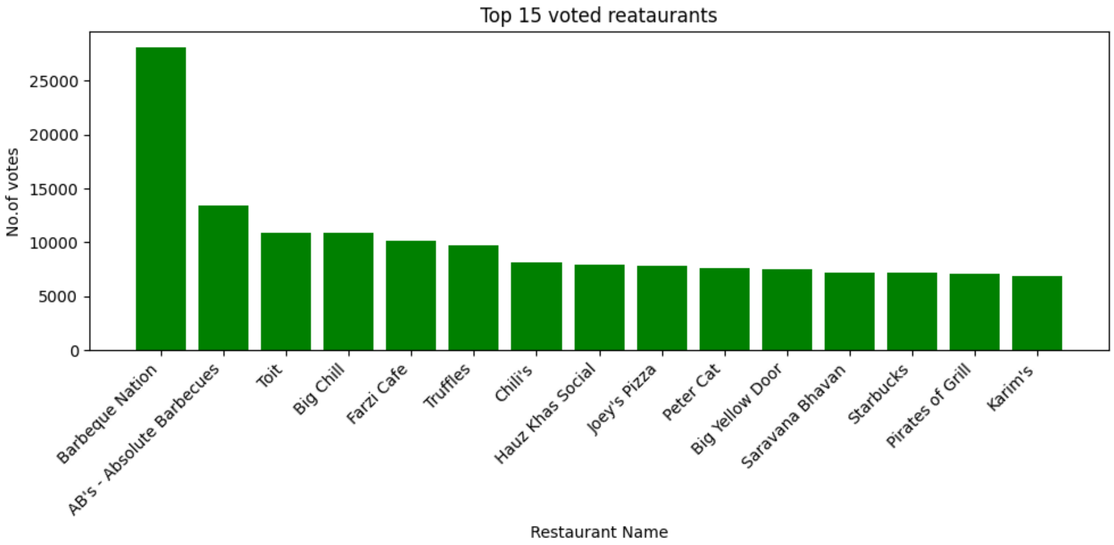
[66]:
```
sort_votes = ch_votes.sort_values(by ="vote count", ascending=False)
Top_15 = sort_votes.head(15)
Top_15
```

[66]:
```
                Restaurant Name  vote count
663              Barbeque Nation       28142
101   AB's - Absolute Barbecues       13400
```

```
6935                      Toit       10934
785                   Big Chill      10853
2294                 Farzi Cafe      10098
6980                   Truffles       9682
1510                    Chili's       8156
2875           Hauz Khas Social       7931
3255               Joey's Pizza       7807
4894                  Peter Cat       7574
796             Big Yellow Door       7511
5563            Saravana Bhavan       7238
6072                  Starbucks       7139
4933           Pirates of Grill       7091
3399                    Karim's       6878
```

[68]:

```
plt.figure(figsize=(10, 5))
plt.bar(Top_15["Restaurant Name"], Top_15["vote count"], color = 'green')
plt.xticks(rotation=45, ha='right')
plt.xlabel("Restaurant Name")
plt.ylabel("No.of votes")
plt.title("Top 15 voted reataurants")
plt.tight_layout()
plt.show()
```



[ ]: