restaurant-analysis

March 3, 2024

[1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import plotly.express as px
import warnings
warnings.filterwarnings('ignore')
```

[2]:
```
ds = pd.read_csv('Restaurant Dataset.csv')
```

[3]:
```
ds.head()
```

[3]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude
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
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
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…	121.056831	14.581404
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			

```
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]
```

[4]:
```
ds.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9551 entries, 0 to 9550
Data columns (total 21 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   Restaurant ID         9551 non-null   int64
 1   Restaurant Name       9551 non-null   object
 2   Country Code          9551 non-null   int64
 3   City                  9551 non-null   object
 4   Address               9551 non-null   object
 5   Locality              9551 non-null   object
 6   Locality Verbose      9551 non-null   object
 7   Longitude             9551 non-null   float64
 8   Latitude              9551 non-null   float64
 9   Cuisines              9542 non-null   object
 10  Average Cost for two  9551 non-null   int64
 11  Currency              9551 non-null   object
 12  Has Table booking     9551 non-null   object
 13  Has Online delivery   9551 non-null   object
```

```
 14  Is delivering now     9551 non-null   object
 15  Switch to order menu  9551 non-null   object
 16  Price range           9551 non-null   int64
 17  Aggregate rating      9551 non-null   float64
 18  Rating color          9551 non-null   object
 19  Rating text           9551 non-null   object
 20  Votes                 9551 non-null   int64
dtypes: float64(3), int64(5), object(13)
memory usage: 1.5+ MB
```

[5]:
```
ds.describe()
```

[5]:

	Restaurant ID	Country Code	Longitude	Latitude	\
count	9.551000e+03	9551.000000	9551.000000	9551.000000	
mean	9.051128e+06	18.365616	64.126574	25.854381	
std	8.791521e+06	56.750546	41.467058	11.007935	
min	5.300000e+01	1.000000	-157.948486	-41.330428	
25%	3.019625e+05	1.000000	77.081343	28.478713	
50%	6.004089e+06	1.000000	77.191964	28.570469	
75%	1.835229e+07	1.000000	77.282006	28.642758	
max	1.850065e+07	216.000000	174.832089	55.976980	

	Average Cost for two	Price range	Aggregate rating	Votes
count	9551.000000	9551.000000	9551.000000	9551.000000
mean	1199.210763	1.804837	2.666370	156.909748
std	16121.183073	0.905609	1.516378	430.169145
min	0.000000	1.000000	0.000000	0.000000
25%	250.000000	1.000000	2.500000	5.000000
50%	400.000000	2.000000	3.200000	31.000000
75%	700.000000	2.000000	3.700000	131.000000
max	800000.000000	4.000000	4.900000	10934.000000

[6]:
```
ds.isnull().sum()
```

[6]:
```
Restaurant ID         0
Restaurant Name       0
Country Code          0
City                  0
Address               0
Locality              0
Locality Verbose      0
Longitude             0
Latitude              0
Cuisines              9
Average Cost for two  0
Currency              0
Has Table booking     0
```

```
Has Online delivery     0
Is delivering now       0
Switch to order menu    0
Price range             0
Aggregate rating        0
Rating color            0
Rating text             0
Votes                   0
dtype: int64
```

Determine the top three most common cuisines in the dataset

[7]:
```
ds['Cuisines'].value_counts().head(3)
```

[7]:
```
Cuisines
North Indian              936
North Indian, Chinese     511
Chinese                   354
Name: count, dtype: int64
```

Calculate the percentage of restaurants that serve each of the top cuisines

[8]:
```
(ds['Cuisines'].value_counts().head(3)/len(ds))*100
```

[8]:
```
Cuisines
North Indian              9.800021
North Indian, Chinese     5.350225
Chinese                   3.706418
Name: count, dtype: float64
```

Identify the city with the highest number of restaurants in the dataset

[9]:
```
ds['City'].value_counts().idxmax()
```

[9]:
```
'New Delhi'
```

Calculate the average rating for restaurants in each city

[10]:
```
ds.groupby('City')['Aggregate rating'].mean()
```

[10]:
```
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
```

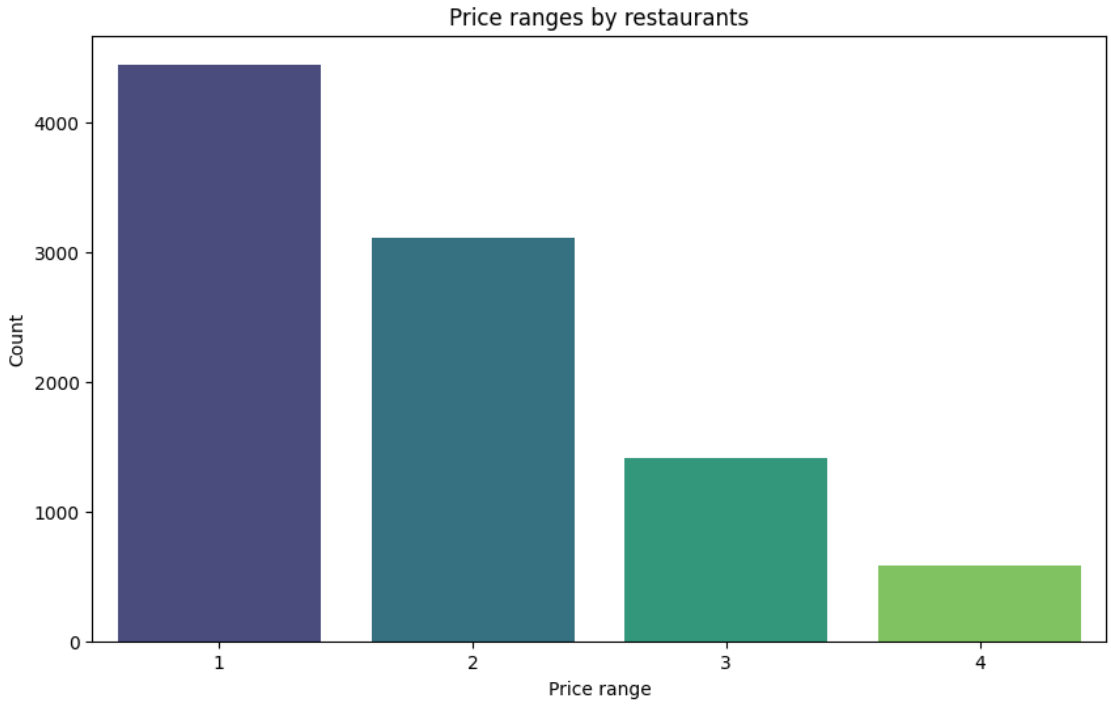
Determine the city with the highest average rating

[11]:
```
ds.groupby('City')['Aggregate rating'].mean().idxmax()
```

[11]:
```
'Inner City'
```

Create a histogram or bar chart to visualize the distribution of price ranges among the restaurants

[12]:
```
plt.figure(figsize=(10,6))
sns.countplot(x = 'Price range',data = ds,palette='viridis')
plt.title('Price ranges by restaurants')
plt.xlabel('Price range')
plt.ylabel('Count')
plt.show()
```



Calculate the percentage of restaurants in each price range category

[13]:
```
ds['Price range'].value_counts(normalize=True)*100
```

[13]:
```
Price range
1    46.529159
2    32.593446
3    14.741912
4     6.135483
Name: proportion, dtype: float64
```

Determine the percentage of restaurants that offer online delivery

[14]:
```
ds['Has Online delivery'].value_counts(normalize=True)*100
```

[14]:
```
Has Online delivery
No     74.337766
Yes    25.662234
Name: proportion, dtype: float64
```

Compare the average ratings of restaurants with and without online delivery

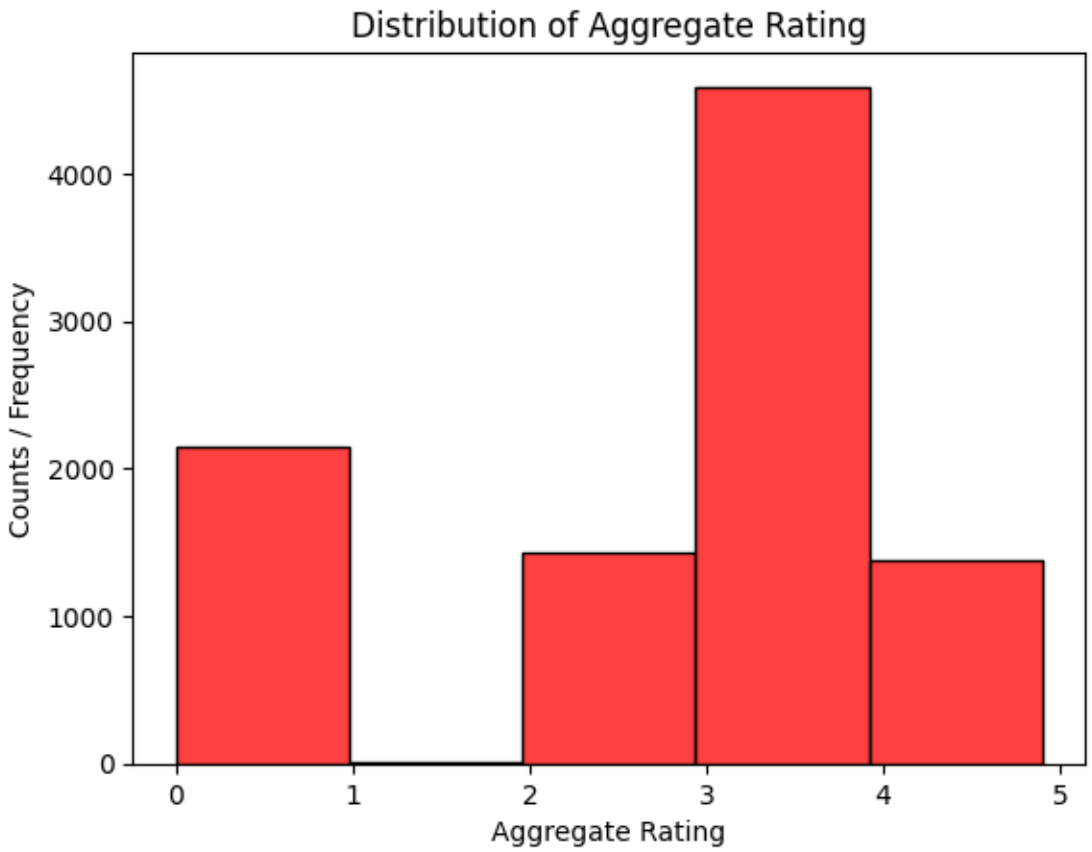
[15]:
```
ds.groupby('Has Online delivery')['Aggregate rating'].mean()
```

[15]:
```
Has Online delivery
No     2.465296
Yes    3.248837
Name: Aggregate rating, dtype: float64
```

Analyze the distribution of aggregate ratings and determine the most common rating range.

[16]:
```
sns.histplot(ds['Aggregate rating'],bins = 5,color = 'red')
plt.title('Distribution of Aggregate Rating')
plt.xlabel('Aggregate Rating')
plt.ylabel('Counts / Frequency')
plt.show
```

[16]:
```
<function matplotlib.pyplot.show(close=None, block=None)>
```



[17]:
```
print(ds['Aggregate rating'].value_counts().idxmax())
print(ds['Aggregate rating'].value_counts().max())
```

```
0.0
2148
```

Calculate the average number of votes received by restaurants

[18]:
```
ds['Votes'].mean()
```

[18]:
```
156.909747670401
```

Identify the most common combinations of cuisines in the dataset

[19]:
```
ds['Cuisines'].value_counts()
```

[19]:
```
Cuisines
North Indian                                936
North Indian, Chinese                       511
Chinese                                     354
Fast Food                                   354
```

```
North Indian, Mughlai                                   334
                                                        …
Bengali, Fast Food                                        1
North Indian, Rajasthani, Asian                           1
Chinese, Thai, Malaysian, Indonesian                      1
Bakery, Desserts, North Indian, Bengali, South Indian     1
Italian, World Cuisine                                    1
Name: count, Length: 1825, dtype: int64
```

[20]:
```
ds['Cuisines'].str.split(', ').explode().value_counts().idxmax()
```

[20]:
```
'North Indian'
```

Determine if certain cuisine combinations tend to have higher ratings

[21]:
```
ds['Combined Cuisines'] = ds['Cuisines'].str.split(', ')
ds.explode('Combined Cuisines').groupby('Combined Cuisines')['Aggregate␣
↪rating'].mean()
```

[21]:
```
Combined Cuisines
Afghani          1.971429
African          3.525000
American         3.661538
Andhra           3.870000
Arabian          3.385714
                   …
Turkish Pizza    4.325000
Vegetarian       4.073913
Vietnamese       3.923810
Western          4.140000
World Cuisine    4.300000
Name: Aggregate rating, Length: 145, dtype: float64
```

[22]:
```
print(ds.groupby(['Cuisines'])['Aggregate rating'].mean().reset_index())
```

```
                                     Cuisines  Aggregate rating
0                                      Afghani             0.725
1                        Afghani, Mughlai, Chinese             0.000
2                            Afghani, North Indian             0.000
3     Afghani, North Indian, Pakistani, Arabian             0.000
4                                      African             4.700
…                                          …                …
1820                     Western, Asian, Cafe             4.200
1821                  Western, Fusion, Fast Food             3.200
1822                                World Cuisine             4.900
1823            World Cuisine, Mexican, Italian             4.400
1824            World Cuisine, Patisserie, Cafe             4.200
```

```
[1825 rows x 2 columns]
```

[23]:
```
ds.groupby(['Cuisines'])['Aggregate rating'].mean().reset_index().max()
```

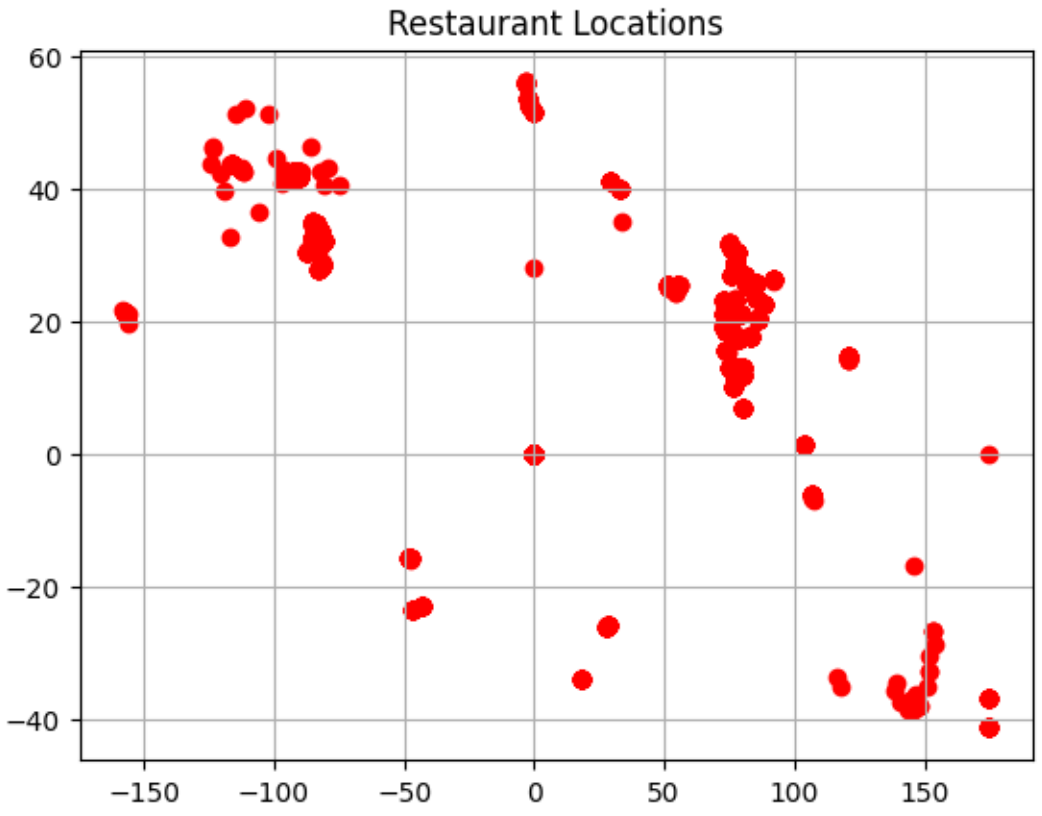
[23]:
```
Cuisines            World Cuisine, Patisserie, Cafe
Aggregate rating                                4.9
dtype: object
```

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

[24]:
```
figure = px.scatter_geo(ds,
                        lat ='Latitude',
                        lon = 'Longitude',
                        color = 'Restaurant Name',
                        hover_name = 'Restaurant Name',
                        title = 'Restaurant locations')
figure.show()
```

Identify any patterns or clusters of restaurants in specific area

[25]:
```
plt.scatter(ds['Longitude'],ds['Latitude'],color='red')
plt.title('Restaurant Locations')
plt.grid(True)
plt.show()
```



Identify if there are any restaurant chains present in the dataset

[26]:
```
chains = ds['Restaurant Name'].value_counts()
chains[chains > 1]
```

[26]:
```
Restaurant Name
Cafe Coffee Day       83
Domino's Pizza        79
Subway                63
Green Chick Chop      51
McDonald's            48
                      ..
Town Hall              2
Halki Aanch            2
Snack Junction         2
Delhi Biryani Hut      2
Beliram Degchiwala     2
Name: count, Length: 734, dtype: int64
```

Analyze the ratings and popularity of different restaurant chains

[27]:
```
ds['Name'] = ds['Restaurant Name']
new_df = pd.DataFrame({
    'Average Rating': ds.groupby('Name')['Aggregate rating'].mean(),
    'Total Votes': ds.groupby('Name')['Votes'].sum()})
new_df.sort_values(by='Average Rating', ascending=False)
```

[27]:

Name	Average Rating	Total Votes
Restaurant Mosaic @ The Orient	4.9	85
Ministry of Crab	4.9	203
Miann	4.9	281
Shorts Burger and Shine	4.9	820
Milse	4.9	754
…	…	…
Cafe Corner	0.0	3
Pheva Tandooris	0.0	0
Pick & Carry	0.0	2
Cafe Brownie	0.0	3
Famous Parantha and Poori Sabzi	0.0	0

[7446 rows x 2 columns]

[ ]:
```

```