and-recommending-best-restaurants

July 8, 2023

[1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from matplotlib import rc
```

[2]:
```
data = pd.read_excel(r'data.xlsx')
```

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

[3]:
```
   Restaurant ID             Restaurant Name  Country Code     City  \
0        7402935                        Skye            94  Jakarta
1        7410290     Satoo - Hotel Shangri-La            94  Jakarta
2        7420899                  Sushi Masa            94  Jakarta
3        7421967              3 Wise Monkeys            94  Jakarta
4        7422489  Avec Moi Restaurant and Bar            94  Jakarta

                                            Address  \
0  Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri…
1              Hotel Shangri-La, Jl. Jend. Sudirman
2                  Jl. Tuna Raya No. 5, Penjaringan
3               Jl. Suryo No. 26, Senopati, Jakarta
4  Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta

                      Locality                        Locality Verbose  \
0  Grand Indonesia Mall, Thamrin  Grand Indonesia Mall, Thamrin, Jakarta
1     Hotel Shangri-La, Sudirman     Hotel Shangri-La, Sudirman, Jakarta
2                    Penjaringan                    Penjaringan, Jakarta
3                       Senopati                       Senopati, Jakarta
4                        Thamrin                        Thamrin, Jakarta

    Longitude  Latitude                    Cuisines  Average Cost for two  \
0  106.821999 -6.196778        Italian, Continental                800000
1  106.818961 -6.203292  Asian, Indonesian, Western                800000
2  106.800144 -6.101298              Sushi, Japanese                500000
3  106.813400 -6.235241                    Japanese                450000
4  106.821023 -6.196270             French, Western                350000
```

```
                 Currency Has Table booking Has Online delivery  Price range  \
0  Indonesian Rupiah(IDR)                No                  No            3
1  Indonesian Rupiah(IDR)                No                  No            3
2  Indonesian Rupiah(IDR)                No                  No            3
3  Indonesian Rupiah(IDR)                No                  No            3
4  Indonesian Rupiah(IDR)                No                  No            3

   Aggregate rating Rating color Rating text  Votes
0               4.1        Green   Very Good   1498
1               4.6   Dark Green   Excellent    873
2               4.9   Dark Green   Excellent    605
3               4.2        Green   Very Good    395
4               4.3        Green   Very Good    243
```

[4]:
```
cc = pd.read_excel(r'C:\Users\Lenovo\Desktop\hh\Country-Code.xlsx')
```

[5]:
```
df_rest=pd.merge(data,cc,on='Country Code',how='left')
df_rest.head()
```

[5]:
```
   Restaurant ID             Restaurant Name  Country Code     City  \
0        7402935                        Skye            94  Jakarta
1        7410290     Satoo - Hotel Shangri-La            94  Jakarta
2        7420899                  Sushi Masa            94  Jakarta
3        7421967              3 Wise Monkeys            94  Jakarta
4        7422489  Avec Moi Restaurant and Bar            94  Jakarta

                                             Address  \
0  Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri…
1               Hotel Shangri-La, Jl. Jend. Sudirman
2                   Jl. Tuna Raya No. 5, Penjaringan
3                 Jl. Suryo No. 26, Senopati, Jakarta
4  Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta

                     Locality                       Locality Verbose  \
0  Grand Indonesia Mall, Thamrin  Grand Indonesia Mall, Thamrin, Jakarta
1     Hotel Shangri-La, Sudirman     Hotel Shangri-La, Sudirman, Jakarta
2                  Penjaringan                   Penjaringan, Jakarta
3                     Senopati                      Senopati, Jakarta
4                      Thamrin                       Thamrin, Jakarta

    Longitude  Latitude                   Cuisines  Average Cost for two  \
0  106.821999 -6.196778        Italian, Continental                800000
1  106.818961 -6.203292  Asian, Indonesian, Western                800000
2  106.800144 -6.101298             Sushi, Japanese                500000
3  106.813400 -6.235241                    Japanese                450000
4  106.821023 -6.196270             French, Western                350000
```

```
                Currency Has Table booking Has Online delivery  Price range  \
0  Indonesian Rupiah(IDR)               No                  No            3
1  Indonesian Rupiah(IDR)               No                  No            3
2  Indonesian Rupiah(IDR)               No                  No            3
3  Indonesian Rupiah(IDR)               No                  No            3
4  Indonesian Rupiah(IDR)               No                  No            3

   Aggregate rating Rating color Rating text  Votes    Country
0               4.1        Green   Very Good   1498  Indonesia
1               4.6   Dark Green   Excellent    873  Indonesia
2               4.9   Dark Green   Excellent    605  Indonesia
3               4.2        Green   Very Good    395  Indonesia
4               4.3        Green   Very Good    243  Indonesia
```

[6]:
```
df_rest.columns = df_rest.columns.str.replace(' ','_')
df_rest.columns
```

[6]:
```
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', 'Price_range', 'Aggregate_rating',
       'Rating_color', 'Rating_text', 'Votes', 'Country'],
      dtype='object')
```

[7]:
```
df_rest.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 9551 entries, 0 to 9550
Data columns (total 20 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   Restaurant_ID         9551 non-null   int64
 1   Restaurant_Name       9550 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  Price_range           9551 non-null   int64
 15  Aggregate_rating      9551 non-null   float64
 16  Rating_color          9551 non-null   object
 17  Rating_text           9551 non-null   object
 18  Votes                 9551 non-null   int64
 19  Country               9551 non-null   object
dtypes: float64(3), int64(5), object(12)
memory usage: 1.5+ MB
```

[8]:
```
df_rest.isnull().sum() #total number of null entries per column
```

[8]:
```
Restaurant_ID           0
Restaurant_Name         1
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
Price_range             0
Aggregate_rating        0
Rating_color            0
Rating_text             0
Votes                   0
Country                 0
dtype: int64
```

[9]:
```
df_rest[df_rest['Restaurant_Name'].isnull()]
```

[9]:
```
      Restaurant_ID Restaurant_Name  Country_Code       City  \
1646         113702             NaN             1  Ahmedabad

                                          Address  Locality  \
1646  Opposite Sindhu Bhawan, Bodakdev, Ahmedabad  Bodakdev

         Locality_Verbose  Longitude   Latitude  \
1646  Bodakdev, Ahmedabad  72.501764  23.040163

                                         Cuisines  Average_Cost_for_two  \
1646  North Indian, Continental, Mexican, Italian                   800

                Currency Has_Table_booking Has_Online_delivery  Price_range  \
1646  Indian Rupees(Rs.)                 No                 No            3

      Aggregate_rating Rating_color Rating_text  Votes Country
1646               4.1        Green   Very Good    769   India
```

[10]:
```
#Since the restaurant name is missing, we dropped the record and reset the␣
 ↪index.
df_rest.dropna(axis=0,subset=['Restaurant_Name'],inplace=True)
df_rest.reset_index(drop=True,inplace=True)
df_rest[df_rest['Cuisines'].isnull()]
```

[10]:
```
      Restaurant_ID                 Restaurant_Name  Country_Code  \
9082       17374552                  Corkscrew Cafe           216
9085       17501439                        Dovetail           216
9093       17059060                       Hillstone           216
9405       17284158                Jimmie's Hot Dogs           216
9493       17142698                 Leonard's Bakery           216
9503       17616465         Tybee Island Social Club           216
9532       17284105                    Cookie Shoppe           216
9534       17284211  Pearly's Famous Country Cookng           216
9538       17606621               HI Lite Bar & Lounge          216

                City                                     Address  \
9082     Gainesville               51 W Main St, Dahlonega, GA 30533
9085           Macon                543 Cherry St, Macon, GA 31201
9093         Orlando  215 South Orlando Avenue, Winter Park, FL 32789
9405          Albany               204 S Jackson St, Albany, GA 31701
9493  Rest of Hawaii             933 Kapahulu Ave, Honolulu, HI 96816
9503        Savannah          1311 Butler Ave, Tybee Island, GA 31328
9532          Albany               115 N Jackson St, Albany, GA 31701
9534          Albany             814 N Slappey Blvd, Albany, GA 31701
9538          Miller             109 N Broadway Ave, Miller, SD 57362

          Locality          Locality_Verbose   Longitude   Latitude Cuisines  \
9082     Dahlonega    Dahlonega, Gainesville  -83.985800  34.531800      NaN
9085         Macon              Macon, Macon  -83.627979  32.836410      NaN
9093   Winter Park      Winter Park, Orlando  -81.365260  28.596682      NaN
9405        Albany            Albany, Albany  -84.153400  31.575100      NaN
9493       Kaimuki  Kaimuki, Rest of Hawaii -157.813432  21.284586      NaN
9503  Tybee Island    Tybee Island, Savannah  -80.848297  31.995810      NaN
9532        Albany            Albany, Albany  -84.154000  31.577200      NaN
9534        Albany            Albany, Albany  -84.175900  31.588200      NaN
9538        Miller            Miller, Miller  -98.989100  44.515800      NaN

      Average_Cost_for_two   Currency Has_Table_booking Has_Online_delivery  \
9082                    40  Dollar($)                No                  No
9085                    40  Dollar($)                No                  No
```

```
9093                  40  Dollar($)               No                 No
9405                  10  Dollar($)               No                 No
9493                  10  Dollar($)               No                 No
9503                  10  Dollar($)               No                 No
9532                   0  Dollar($)               No                 No
9534                   0  Dollar($)               No                 No
9538                   0  Dollar($)               No                 No

      Price_range  Aggregate_rating Rating_color Rating_text  Votes  \
9082            3               3.9       Yellow        Good    209
9085            3               3.8       Yellow        Good    102
9093            3               4.4        Green   Very Good   1158
9405            1               3.9       Yellow        Good    160
9493            1               4.7   Dark Green   Excellent    707
9503            1               3.9       Yellow        Good    309
9532            1               3.4       Orange     Average     34
9534            1               3.4       Orange     Average     36
9538            1               3.4       Orange     Average     11

            Country
9082  United States
9085  United States
9093  United States
9405  United States
9493  United States
9503  United States
9532  United States
9534  United States
9538  United States
```

[11]:
```
#Since there were only 9 records without cuisines, we have replace the null␣
↪values with Others.
df_rest['Cuisines'].fillna('Others',inplace=True)
```

[12]:
```
df_rest.isnull().sum()
df_rest.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9550 entries, 0 to 9549
Data columns (total 20 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   Restaurant_ID         9550 non-null   int64
 1   Restaurant_Name       9550 non-null   object
 2   Country_Code          9550 non-null   int64
 3   City                  9550 non-null   object
 4   Address               9550 non-null   object
 5   Locality              9550 non-null   object
 6   Locality_Verbose      9550 non-null   object
 7   Longitude             9550 non-null   float64
 8   Latitude              9550 non-null   float64
 9   Cuisines              9550 non-null   object
 10  Average_Cost_for_two  9550 non-null   int64
 11  Currency              9550 non-null   object
 12  Has_Table_booking     9550 non-null   object
 13  Has_Online_delivery   9550 non-null   object
 14  Price_range           9550 non-null   int64
 15  Aggregate_rating      9550 non-null   float64
 16  Rating_color          9550 non-null   object
 17  Rating_text           9550 non-null   object
 18  Votes                 9550 non-null   int64
 19  Country               9550 non-null   object
dtypes: float64(3), int64(5), object(12)
memory usage: 1.5+ MB
```

[13]:
```
#Explore the geographical distribution of the restaurants.
#Finding out the cities with maximum / minimum number of restaurants
#Explore the franchise with most national presence
#Ratio between restaurants that allow table booking vs that do not allow table␣
 ↪booking.
#Percentage of restaurants providing online delivery.
#Difference in no. of votes for the restaurants that deliver and the restaurant␣
 ↪that don't.
```

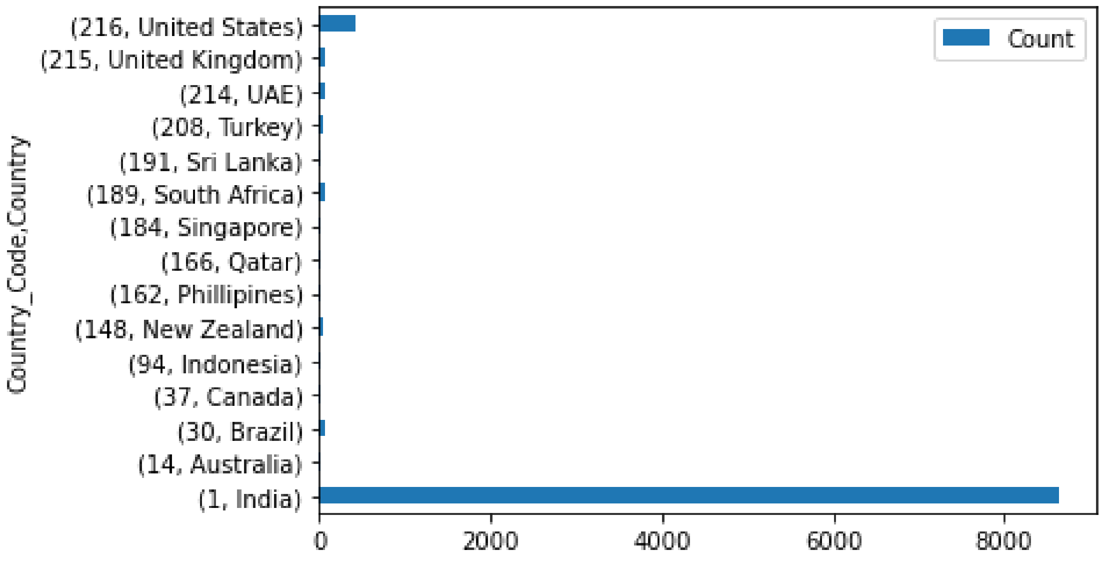
[14]:
```
cntry_dist = df_rest.groupby(['Country_Code','Country']).agg( Count =␣
 ↪('Restaurant_ID','count'))
cntry_dist.sort_values(by='Count',ascending=False)
#We observe that India has then highest number of restaurants with 8651␣
 ↪restaurants and USA is number 2 with 434 restaurants
```

[14]:
```
                              Count
Country_Code Country
1            India             8651
216          United States      434
215          United Kingdom      80
30           Brazil              60
189          South Africa        60
214          UAE                 60
148          New Zealand         40
208          Turkey              34
14           Australia           24
162          Phillipines         22
94           Indonesia           21
166          Qatar               20
```

```
184          Singapore          20
191          Sri Lanka          20
37           Canada              4
```

[15]:
```
cntry_dist.plot(kind='barh')
```

[15]:
```
<AxesSubplot:ylabel='Country_Code,Country'>
```



[16]:
```
city_dist = df_rest.groupby(['Country','City']).agg(Count =␣
  ↪('Restaurant_ID','count'))
city_dist.describe()
#city with max restaurant has count = 5473
#city with min restaurant has count = 1
```

[16]:
```
            Count
count  141.000000
mean    67.730496
std    476.723952
min      1.000000
25%      1.000000
50%     20.000000
75%     20.000000
max   5473.000000
```

[17]:
```
city_dist.sort_values(by='Count',ascending=False)
# we see that new Delhi has the maximum restaurant with 5473
# we observe that multiple cities have only one restaurant.
```

```
[17]:                                Count
      Country       City
      India         New Delhi         5473
                    Gurgaon           1118
                    Noida             1080
                    Faridabad          251
                    Ghaziabad           25
      …                              …
                    Panchkula            1
      Australia     Balingup             1
      Indonesia     Bandung              1
      Phillipines   Quezon City          1
      United States Winchester Bay       1

      [141 rows x 1 columns]
```

```
[18]: min_cnt_rest = city_dist[city_dist['Count']==1]
      min_cnt_rest.info()
      min_cnt_rest
      #There are 46 cities in 7 different countries with 1 restaurants
```

```
<class 'pandas.core.frame.DataFrame'>
MultiIndex: 46 entries, ('Australia', 'Armidale') to ('United States',
'Winchester Bay')
Data columns (total 1 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Count   46 non-null     int64
dtypes: int64(1)
memory usage: 1.8+ KB
```

```
[18]:                                   Count
      Country       City
      Australia     Armidale                1
                    Balingup                1
                    Beechworth              1
                    Dicky Beach             1
                    East Ballina            1
                    Flaxton                 1
                    Forrest                 1
                    Huskisson               1
                    Inverloch               1
                    Lakes Entrance          1
                    Lorn                    1
                    Macedon                 1
                    Mayfield                1
                    Middleton Beach         1
```

```
              Montville             1
              Palm Cove             1
              Paynesville           1
              Penola                1
              Phillip Island        1
              Tanunda               1
              Trentham East         1
              Victor Harbor         1
Canada        Chatham-Kent          1
              Consort               1
              Vineland Station      1
              Yorkton               1
India         Mohali                1
              Panchkula             1
Indonesia     Bandung               1
Phillipines   Quezon City           1
              Tagaytay City         1
South Africa  Randburg              1
United States Clatskanie            1
              Cochrane              1
              Fernley               1
              Lakeview              1
              Lincoln               1
              Mc Millan             1
              Miller                1
              Monroe                1
              Ojo Caliente          1
              Potrero               1
              Princeton             1
              Vernonia              1
              Weirton               1
              Winchester Bay        1
```

[19]:
```python
franch_dist = df_rest.groupby(['Restaurant_Name','Country']).agg(Count =␣
 ↪('Country','count'))
franch_dist.describe()
```

[19]:
```
             Count
count  7472.000000
mean      1.278105
std       2.165675
min       1.000000
25%       1.000000
50%       1.000000
75%       1.000000
max      83.000000
```

[20]:
```
franch_dist.sort_values(by='Count',ascending=False)
#cafe Coffe day has most national prsesence
```

[20]:
```
                                                    Count
Restaurant_Name                 Country
Cafe Coffee Day                 India                  83
Domino's Pizza                  India                  79
Subway                          India                  63
Green Chick Chop                India                  51
McDonald's                      India                  48
…                                                   …
Gibson's Gourmet Burgers & Ribs South Africa            1
Giapo                           New Zealand             1
Giani's di Hatti                India                   1
Gian Ji Punjabi Dhaba           India                   1
Ìàukura€Ùa Sofras€±             Turkey                  1

[7472 rows x 1 columns]
```

[21]:
```
df_rest1 = df_rest.copy()
df_rest1.columns
```

[21]:
```
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', 'Price_range', 'Aggregate_rating',
       'Rating_color', 'Rating_text', 'Votes', 'Country'],
      dtype='object')
```

[22]:
```
dummy = ['Has_Table_booking','Has_Online_delivery']
df_rest1 = pd.get_dummies(df_rest1,columns=dummy,drop_first=True)
df_rest1.head()
# 0 indicates 'NO'
# 1 indicates 'YES'
```

[22]:
```
   Restaurant_ID              Restaurant_Name  Country_Code     City  \
0        7402935                         Skye            94  Jakarta
1        7410290     Satoo - Hotel Shangri-La            94  Jakarta
2        7420899                   Sushi Masa            94  Jakarta
3        7421967               3 Wise Monkeys            94  Jakarta
4        7422489  Avec Moi Restaurant and Bar            94  Jakarta

                                             Address  \
0  Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri…
1               Hotel Shangri-La, Jl. Jend. Sudirman
2                   Jl. Tuna Raya No. 5, Penjaringan
3                 Jl. Suryo No. 26, Senopati, Jakarta
```

```
4  Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta

                     Locality                          Locality_Verbose  \
0  Grand Indonesia Mall, Thamrin  Grand Indonesia Mall, Thamrin, Jakarta
1     Hotel Shangri-La, Sudirman     Hotel Shangri-La, Sudirman, Jakarta
2                    Penjaringan                    Penjaringan, Jakarta
3                       Senopati                       Senopati, Jakarta
4                        Thamrin                        Thamrin, Jakarta

    Longitude  Latitude                    Cuisines  Average_Cost_for_two  \
0  106.821999 -6.196778        Italian, Continental                800000
1  106.818961 -6.203292  Asian, Indonesian, Western                800000
2  106.800144 -6.101298             Sushi, Japanese                500000
3  106.813400 -6.235241                    Japanese                450000
4  106.821023 -6.196270             French, Western                350000

                Currency  Price_range  Aggregate_rating Rating_color  \
0  Indonesian Rupiah(IDR)            3               4.1        Green
1  Indonesian Rupiah(IDR)            3               4.6   Dark Green
2  Indonesian Rupiah(IDR)            3               4.9   Dark Green
3  Indonesian Rupiah(IDR)            3               4.2        Green
4  Indonesian Rupiah(IDR)            3               4.3        Green

  Rating_text  Votes    Country  Has_Table_booking_Yes  \
0   Very Good   1498  Indonesia                      0
1   Excellent    873  Indonesia                      0
2   Excellent    605  Indonesia                      0
3   Very Good    395  Indonesia                      0
4   Very Good    243  Indonesia                      0

   Has_Online_delivery_Yes
0                        0
1                        0
2                        0
3                        0
4                        0
```

[23]:

```
#Ration between restaurants allowing table booking and those which dont
table_booking = df_rest1[df_rest1['Has_Table_booking_Yes']==1]['Restaurant_ID'].
 ↪count()
table_nbooking =df_rest1[df_rest1['Has_Table_booking_Yes']==0]['Restaurant_ID'].
 ↪count()
print('Ratio between restaurants that allow table booking vs. those that do not␣
 ↪allow table booking: ',
      round((table_booking/table_nbooking),2))
```

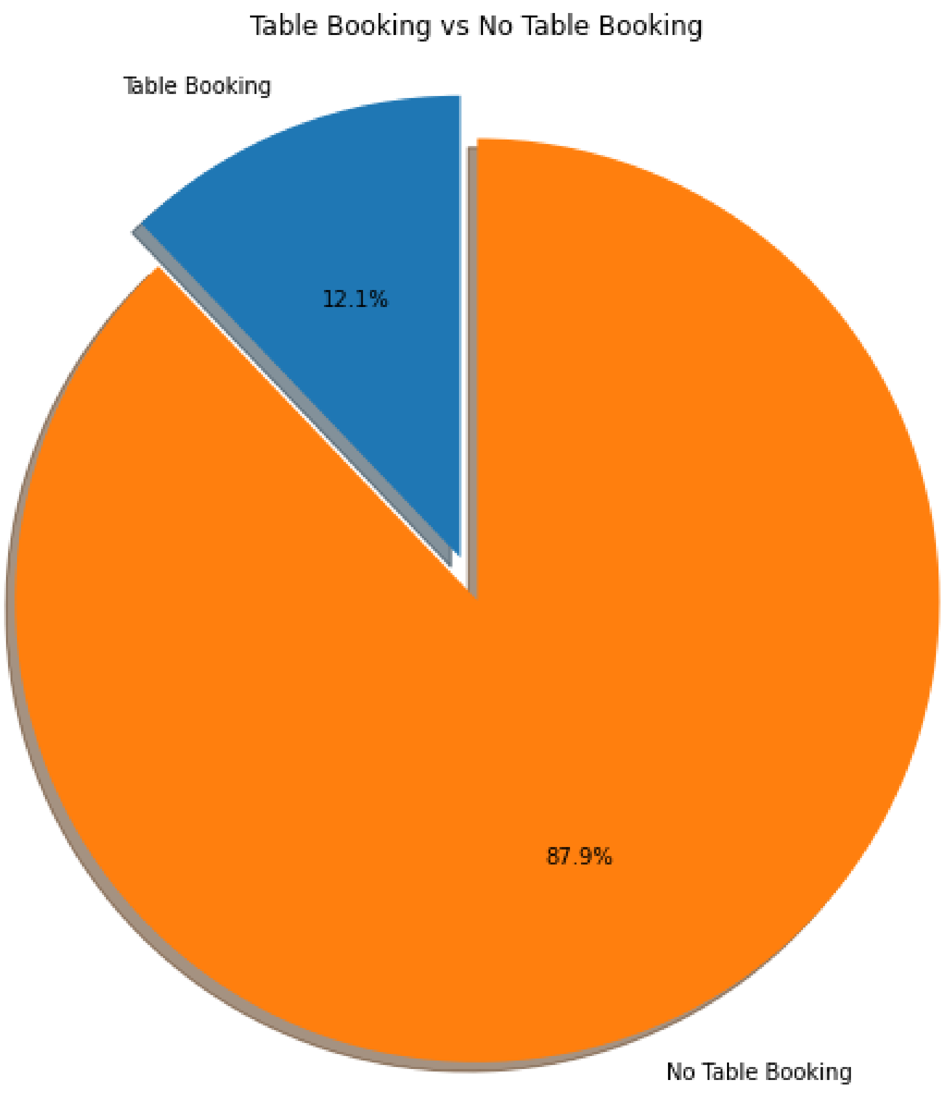
```
Ratio between restaurants that allow table booking vs. those that do not allow
```

```
table booking:  0.14
```

[24]:
```
print(table_booking,table_nbooking)
```

```
1158 8392
```

[25]:
```
#Pie chart to show percentage of restaurants which allow table booking and␣
 ↪those which don't
labels = 'Table Booking', 'No Table Booking'
sizes = [table_booking,table_nbooking]
explode = (0.1, 0)  # only "explode" the 2nd slice (i.e. 'Hogs')

fig1, ax1 = plt.subplots(figsize=(9,9))
ax1.pie(sizes, explode=explode, labels=labels, autopct='%1.1f%%',shadow=True,␣
 ↪startangle=90)
ax1.set_title("Table Booking vs No Table Booking")
ax1.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a circle.

plt.show()
```

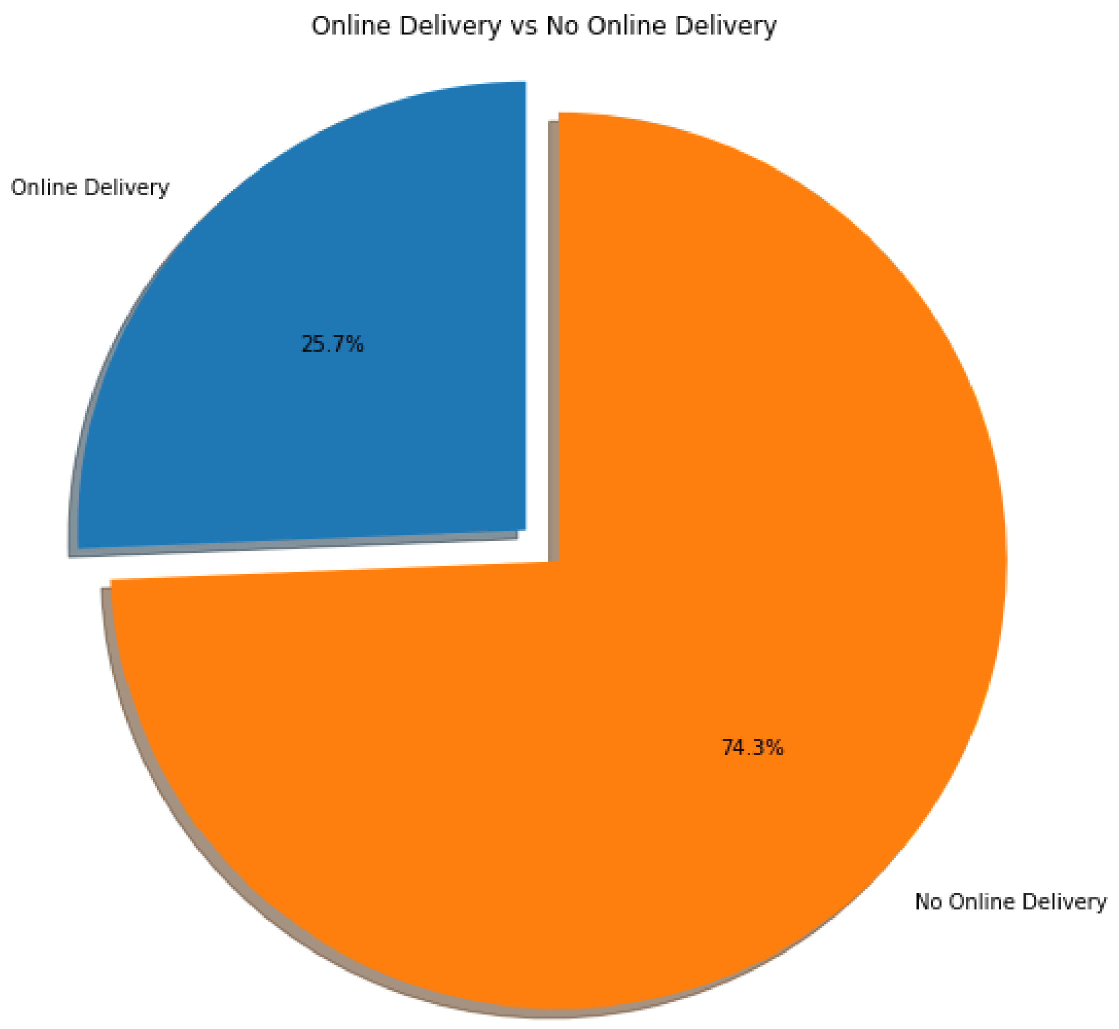


[26]:
```
#Percentage of restaurant that has online delivery
rest_od = df_rest1[df_rest1['Has_Online_delivery_Yes'] == 1]['Restaurant_ID'].
  ↪count()
rest_nod = df_rest1[df_rest1['Has_Online_delivery_Yes'] == 0]['Restaurant_ID'].
  ↪count()
print('Percentage of restaurants providing online delivery : {} %'.
  ↪format((round(rest_od/len(df_rest1),3)*100)))
```

```
Percentage of restaurants providing online delivery : 25.7 %
```

[27]:
```
#pie chart to show percentages of restaurants allowing online delivery vs those␣
  ↪which do not have online delivery
labels = 'Online Delivery','No Online Delivery'
```

```
size = [rest_od,rest_nod]
explode = (0.1,0)
fig1,ax1 = plt.subplots(figsize=(9,9))
ax1.pie(size,explode=explode,labels=labels,autopct='%1.
 ↪1f%%',shadow=True,startangle=90)
ax1.set_title("Online Delivery vs No Online Delivery")
ax1.axis('equal')
plt.show()
```



[28]:
```
rest_deliver = df_rest1[df_rest1['Has_Table_booking_Yes'] == 1]['Votes'].sum()
rest_ndeliver = df_rest1[df_rest1['Has_Table_booking_Yes'] == 0]['Votes'].sum()
print('Difference in number of votes for restaurants that deliver and dont␣
 ↪deliver: ',abs((rest_deliver - rest_ndeliver)))
```

```
Difference in number of votes for restaurants that deliver and dont deliver:
```

```
680082
```

[30]:
```
df_rest.columns
cuisines = df_rest['Cuisines'].apply(lambda x: pd.Series(x.split(',')))
```

[31]:
```
cuisines.columns =␣
 ↪['Cuisine_1','Cuisine_2','Cuisine_3','Cuisine_4','Cuisine_5','Cuisine_6','Cuisine_7','Cuisi
cuisines.tail()
```

[31]:
```
        Cuisine_1      Cuisine_2     Cuisine_3   Cuisine_4 Cuisine_5  \
9545      Chinese   North Indian     Fast Food         NaN       NaN
9546       Indian        Chinese   Continental         NaN       NaN
9547         Cafe    Continental      Desserts   Ice Cream   Italian
9548  Street Food            NaN           NaN         NaN       NaN
9549      Chinese   North Indian           NaN         NaN       NaN

       Cuisine_6 Cuisine_7 Cuisine_8
9545         NaN       NaN       NaN
9546         NaN       NaN       NaN
9547   Beverages       NaN       NaN
9548         NaN       NaN       NaN
9549         NaN       NaN       NaN
```

[32]:
```
df_cuisines = pd.concat([df_rest,cuisines],axis=1)
df_cuisines.head()
```

[32]:
```
   Restaurant_ID              Restaurant_Name  Country_Code     City  \
0        7402935                         Skye            94  Jakarta
1        7410290     Satoo - Hotel Shangri-La            94  Jakarta
2        7420899                   Sushi Masa            94  Jakarta
3        7421967              3 Wise Monkeys            94  Jakarta
4        7422489  Avec Moi Restaurant and Bar            94  Jakarta

                                          Address  \
0  Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri…
1              Hotel Shangri-La, Jl. Jend. Sudirman
2                  Jl. Tuna Raya No. 5, Penjaringan
3                Jl. Suryo No. 26, Senopati, Jakarta
4  Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta

                     Locality                          Locality_Verbose  \
0  Grand Indonesia Mall, Thamrin  Grand Indonesia Mall, Thamrin, Jakarta
1     Hotel Shangri-La, Sudirman     Hotel Shangri-La, Sudirman, Jakarta
2                    Penjaringan                    Penjaringan, Jakarta
3                       Senopati                       Senopati, Jakarta
4                        Thamrin                        Thamrin, Jakarta
```

```
    Longitude  Latitude                      Cuisines  …  Votes    Country  \
0  106.821999 -6.196778        Italian, Continental  …   1498  Indonesia
1  106.818961 -6.203292  Asian, Indonesian, Western  …    873  Indonesia
2  106.800144 -6.101298             Sushi, Japanese  …    605  Indonesia
3  106.813400 -6.235241                    Japanese  …    395  Indonesia
4  106.821023 -6.196270             French, Western  …    243  Indonesia

  Cuisine_1     Cuisine_2  Cuisine_3  Cuisine_4 Cuisine_5 Cuisine_6  \
0   Italian   Continental        NaN        NaN       NaN       NaN
1     Asian    Indonesian    Western        NaN       NaN       NaN
2     Sushi      Japanese        NaN        NaN       NaN       NaN
3  Japanese           NaN        NaN        NaN       NaN       NaN
4    French       Western        NaN        NaN       NaN       NaN

  Cuisine_7 Cuisine_8
0       NaN       NaN
1       NaN       NaN
2       NaN       NaN
3       NaN       NaN
4       NaN       NaN

[5 rows x 28 columns]
```

[33]:
```
cuisine_loc = pd.
 ↪DataFrame(df_cuisines[['Country','City','Locality_Verbose','Cuisine_1','Cuisine_2','Cuisine
                                                                        ␣
 ↪'Cuisine_4','Cuisine_5','Cuisine_6','Cuisine_7','Cuisine_8']])
```

[34]:
```
cuisine_loc_stack=pd.DataFrame(cuisine_loc.stack()) #stacking the columns
cuisine_loc.head()
```

[34]:
```
     Country     City                        Locality_Verbose Cuisine_1  \
0  Indonesia  Jakarta  Grand Indonesia Mall, Thamrin, Jakarta   Italian
1  Indonesia  Jakarta     Hotel Shangri-La, Sudirman, Jakarta     Asian
2  Indonesia  Jakarta                   Penjaringan, Jakarta     Sushi
3  Indonesia  Jakarta                      Senopati, Jakarta  Japanese
4  Indonesia  Jakarta                       Thamrin, Jakarta    French

     Cuisine_2 Cuisine_3 Cuisine_4 Cuisine_5 Cuisine_6 Cuisine_7 Cuisine_8
0  Continental       NaN       NaN       NaN       NaN       NaN       NaN
1   Indonesian   Western       NaN       NaN       NaN       NaN       NaN
2     Japanese       NaN       NaN       NaN       NaN       NaN       NaN
3          NaN       NaN       NaN       NaN       NaN       NaN       NaN
4      Western       NaN       NaN       NaN       NaN       NaN       NaN
```

[35]:
```
keys = [c for c in cuisine_loc  if c.startswith('Cuisine')]
```

```
a=pd.melt(cuisine_loc, id_vars='Locality_Verbose', value_vars=keys,␣
 ↪value_name='Cuisines')
#melting the stack into one row
max_rate=pd.DataFrame(a.groupby(by=['Locality_Verbose','variable','Cuisines']).
 ↪size().reset_index())
#find the highest restuarant in the city
max_rate
del max_rate['variable']
max_rate.columns=['Locality_Verbose','Cuisines','Count']
max_rate.head()
```

[35]:
```
                                 Locality_Verbose      Cuisines  Count
0      ILD Trade Centre Mall, Sohna Road, Gurgaon          Cafe      1
1      ILD Trade Centre Mall, Sohna Road, Gurgaon  North Indian      1
2      ILD Trade Centre Mall, Sohna Road, Gurgaon     Beverages      1
3      ILD Trade Centre Mall, Sohna Road, Gurgaon       Mughlai      1
4  12th Square Building, Banjara Hills, Hyderabad       Mughlai      1
```

[36]:
```
#find the highest restuarant in the city
loc=max_rate.sort_values('Count', ascending=False).
 ↪groupby(by=['Locality_Verbose'],as_index=False).first()
loc.head()
```

[36]:
```
                                 Locality_Verbose        Cuisines  Count
0      ILD Trade Centre Mall, Sohna Road, Gurgaon            Cafe      1
1  12th Square Building, Banjara Hills, Hyderabad         Mughlai      1
2                  A Hotel, Gurdev Nagar, Ludhiana         Chinese      1
3             ARSS Mall, Paschim Vihar, New Delhi    North Indian      1
4                         Aaya Nagar, New Delhi  Cuisine Varies      1
```

[37]:
```
rating_res=loc.
 ↪merge(df_rest,left_on='Locality_Verbose',right_on='Locality_Verbose',how='inner')
#inner join to merge the two dataframe
df=pd.
 ↪DataFrame(rating_res[['Country','City','Locality_Verbose','Cuisines_x','Count']])
#making a dataframe of rating restaurant
country=rating_res.sort_values('Count', ascending=False).
 ↪groupby(by=['Country'],as_index=False).first()
#grouping the data by country code
con=pd.DataFrame(country[['Country','City','Locality','Cuisines_x','Count']])
con.columns=['Country','City','Locality','Cuisines','Number of restaurants in␣
 ↪the country']
#renaming the columns
con1=con.sort_values('Number of restaurants in the country', ascending=False)
#sorting the restaurants on the basis of the number of restaurants in the␣
 ↪country
```

```
con1[:10]
final_con=con1.drop(con1.index[[7,10]])
```

[38]:
```
final_con
```

[38]:
```
         Country               City  \
3          India          New Delhi
14 United States            Dubuque
5    New Zealand    Wellington City
1         Brazil     Rio de Janeiro
6    Phillipines  Mandaluyong City
8      Singapore          Singapore
9   South Africa          Cape Town
11        Turkey             Ankara
12           UAE          Abu Dhabi
0      Australia      Victor Harbor
2         Canada   Vineland Station
4      Indonesia            Jakarta
7          Qatar               Doha

                                    Locality        Cuisines  \
3                            Connaught Place    North Indian
14                                   Dubuque        American
5                                     Te Aro            Cafe
1                                    Ipanema       Brazilian
6        SM Megamall, Ortigas, Mandaluyong City        Japanese
8                 Marina Centre, Downtown Core         Seafood
9                                Green Point           Grill
11                           Gazi Osman PaÅÙa   World Cuisine
12  Abu Dhabi Mall, Tourist Club Area  (Al Zahiyah)        American
0                              Victor Harbor  Coffee and Tea
2                           Vineland Station         Italian
4                                      Tebet         Western
7   The Westin Doha Hotel & Spa, Fereej Bin Mahmoud            Thai

    Number of restaurants in the country
3                                     48
14                                     9
5                                      5
1                                      3
6                                      2
8                                      2
9                                      2
11                                     2
12                                     2
0                                      1
2                                      1
```

```
4                                       1
7                                       1
```

[39]:
```
rest_cuisine = pd.
  ↪DataFrame(df_cuisines[['Restaurant_Name','City','Cuisine_1','Cuisine_2','Cuisine_3','Cuisin
                                                                                          ␣
  ↪'Cuisine_5','Cuisine_6','Cuisine_7','Cuisine_8']])
rest_cuisine_stack=pd.DataFrame(rest_cuisine.stack()) #stacking the columns
rest_cuisine.head()
```

[39]:
```
               Restaurant_Name     City Cuisine_1    Cuisine_2 Cuisine_3  \
0                         Skye  Jakarta   Italian  Continental       NaN
1     Satoo - Hotel Shangri-La  Jakarta     Asian   Indonesian   Western
2                   Sushi Masa  Jakarta     Sushi     Japanese       NaN
3              3 Wise Monkeys  Jakarta  Japanese          NaN       NaN
4  Avec Moi Restaurant and Bar  Jakarta    French      Western       NaN

  Cuisine_4 Cuisine_5 Cuisine_6 Cuisine_7 Cuisine_8
0       NaN       NaN       NaN       NaN       NaN
1       NaN       NaN       NaN       NaN       NaN
2       NaN       NaN       NaN       NaN       NaN
3       NaN       NaN       NaN       NaN       NaN
4       NaN       NaN       NaN       NaN       NaN
```

[40]:
```
keys1 = [c for c in rest_cuisine  if c.startswith('Cuisine')]
b=pd.melt(rest_cuisine, id_vars='Restaurant_Name', value_vars=keys,␣
  ↪value_name='Cuisines')
#melting the stack into one row
max_rate1=pd.DataFrame(b.groupby(by=['Restaurant_Name','variable','Cuisines']).
  ↪size().reset_index())
#find the highest restuarant in the city
max_rate1
del max_rate1['variable']
max_rate1.columns=['Restaurant_Name','Cuisines','Count']
max_rate1.head(20)
```

[40]:
```
            Restaurant_Name       Cuisines  Count
0                     12212      Fast Food      1
1               Let's Burrrp        Chinese      1
2               Let's Burrrp   North Indian      1
3                        #45           Cafe      1
4               #Dilliwaala6   North Indian      1
5               #InstaFreeze      Ice Cream      1
6                #OFF Campus           Cafe      1
7                #OFF Campus    Continental      1
8                #OFF Campus        Italian      1
9                #OFF Campus      Fast Food      1
```

```
10             #Urban CafÌ©   North Indian      1
11             #Urban CafÌ©        Chinese      1
12             #Urban CafÌ©        Italian      1
13                 #hashtag           Cafe      1
14                   'Ohana       Hawaiian      1
15        10 Downing Street   North Indian      2
16        10 Downing Street        Chinese      2
17        10 To 10 In Delhi         Indian      1
18        10 To 10 In Delhi           Cafe      1
19  11th Avenue Cafe Bistro           Cafe      1
```

[41]:
```
max_rate1.sort_values('Count',ascending=False)
#Cafe Coffee Day has the max number of cuisines and The least number of␣
↪cuisines in a resaurant is 1.
```

[41]:
```
              Restaurant_Name       Cuisines  Count
2479          Cafe Coffee Day           Cafe     83
4596           Domino's Pizza          Pizza     79
4597           Domino's Pizza      Fast Food     78
12984                  Subway          Salad     63
12985                  Subway   Healthy Food     63
…                         …             …    …
5568   Gabbar's Bar & Kitchen        Chinese      1
5569   Gabbar's Bar & Kitchen        Mexican      1
5570   Gabbar's Bar & Kitchen        Italian      1
5571             Gaga Manjero  World Cuisine      1
15963     Ìàukura€Ùa Sofras€±         Izgara      1

[15964 rows x 3 columns]
```

[42]:
```
rating =␣
↪df_rest1[['Restaurant_ID','Restaurant_Name','Country','City','Aggregate_rating','Average_Co
```

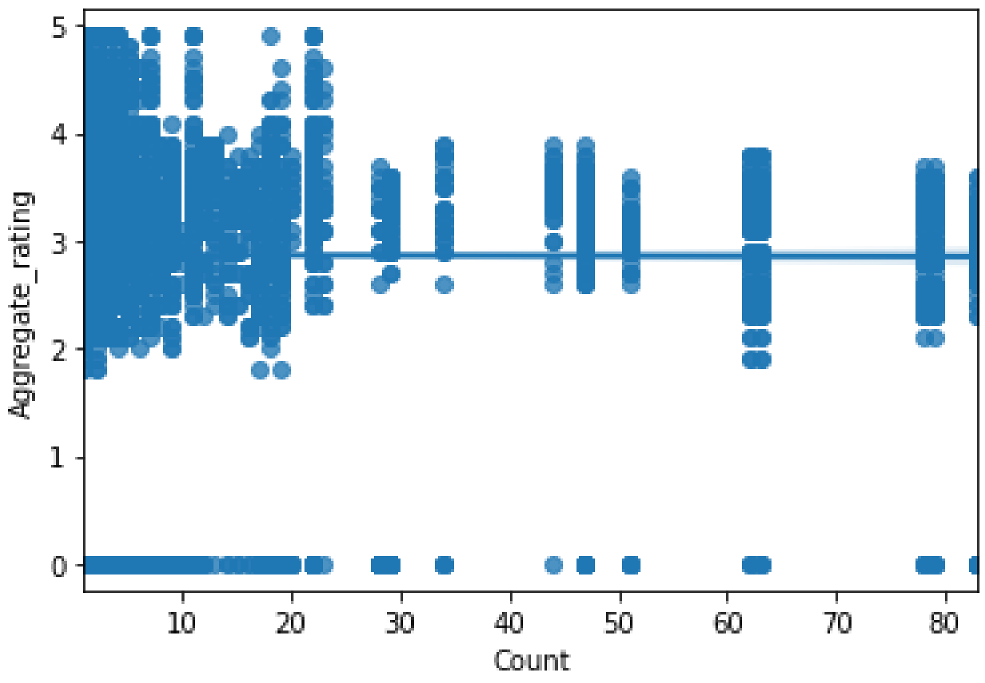
[43]:
```
rating = rating.
↪merge(max_rate1,left_on='Restaurant_Name',right_on='Restaurant_Name',how='left')
rating
```

[43]:
```
      Restaurant_ID           Restaurant_Name    Country      City  \
0           7402935                      Skye  Indonesia   Jakarta
1           7402935                      Skye  Indonesia   Jakarta
2           7410290  Satoo - Hotel Shangri-La  Indonesia   Jakarta
3           7410290  Satoo - Hotel Shangri-La  Indonesia   Jakarta
4           7410290  Satoo - Hotel Shangri-La  Indonesia   Jakarta
…               …                        …        …        …
23810      18312106                UrbanCrave      India    Kanpur
23811      18312106                UrbanCrave      India    Kanpur
23812       3900245        Deena Chat Bhandar      India  Varanasi
```

```
23813       18246202          VNS Live Studio      India  Varanasi
23814       18246202          VNS Live Studio      India  Varanasi

       Aggregate_rating  Average_Cost_for_two  Votes  Price_range  \
0                   4.1                800000   1498            3
1                   4.1                800000   1498            3
2                   4.6                800000    873            3
3                   4.6                800000    873            3
4                   4.6                800000    873            3
…                 …                   …     …           …
23810               3.9                     0    127            1
23811               3.9                     0    127            1
23812               3.8                     0     78            1
23813               3.5                     0    109            1
23814               3.5                     0    109            1

       Has_Table_booking_Yes  Has_Online_delivery_Yes       Cuisines  Count
0                          0                        0        Italian      1
1                          0                        0    Continental      1
2                          0                        0          Asian      1
3                          0                        0     Indonesian      1
4                          0                        0        Western      1
…                      …                       …           …    …
23810                      0                        0        Italian      1
23811                      0                        0      Beverages      1
23812                      0                        0    Street Food      1
23813                      0                        0        Chinese      1
23814                      0                        0   North Indian      1

[23815 rows x 12 columns]
```

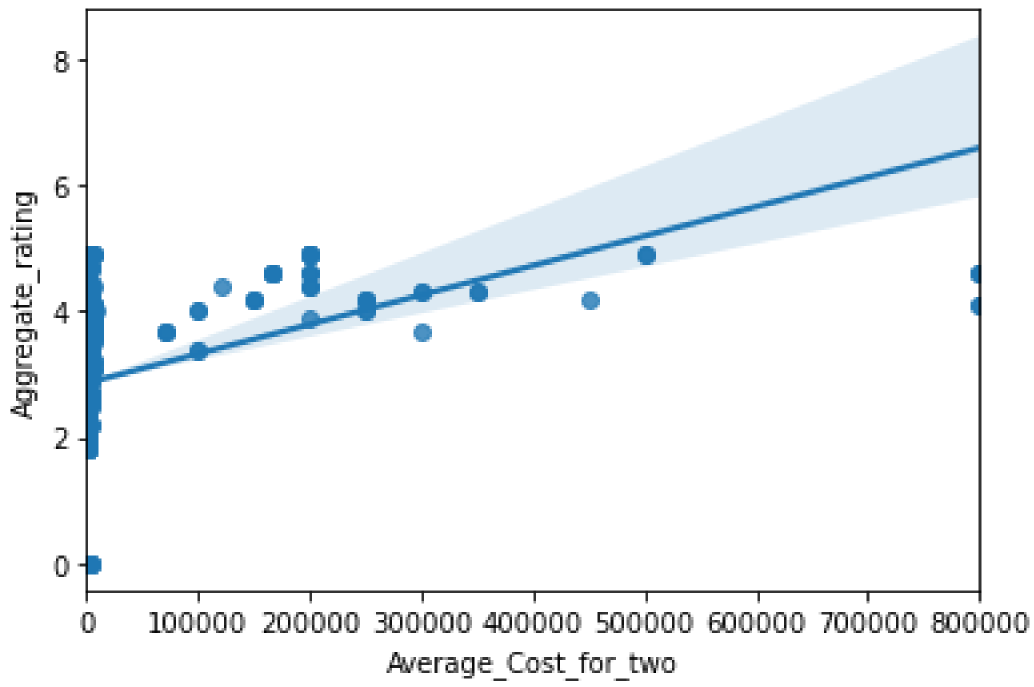
[44]:
```
sns.regplot(x='Count',y='Aggregate_rating',data=rating)
rating[["Count", "Aggregate_rating"]].corr()
#Number of cuisines is not a good factor to decide the rating of a restaurant
```

[44]:
```
                     Count  Aggregate_rating
Count             1.000000         -0.001642
Aggregate_rating -0.001642          1.000000
```



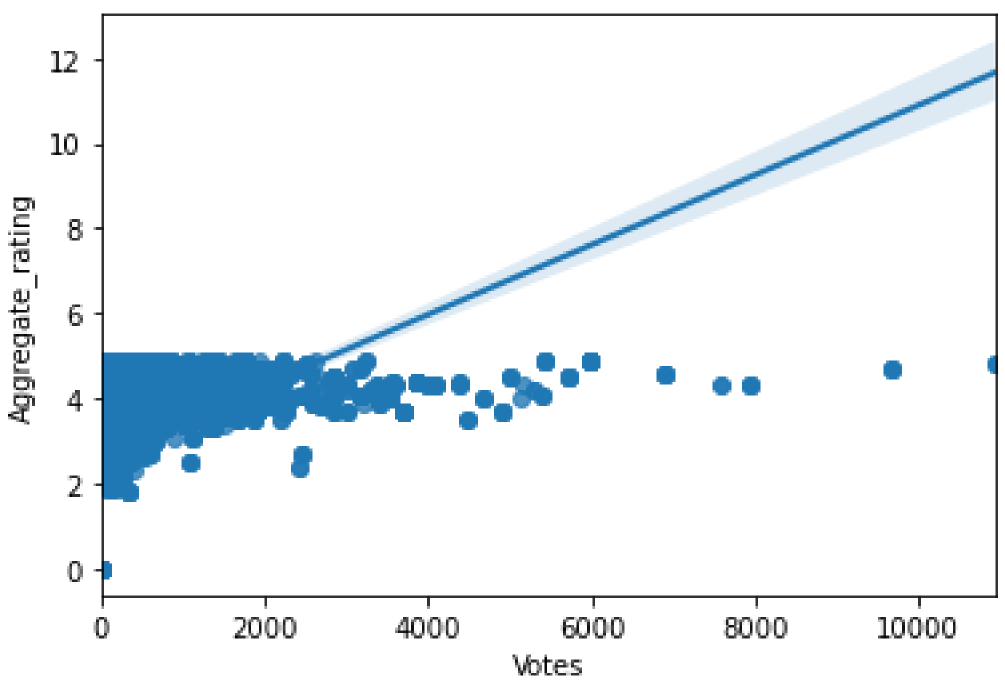
```
[45]: sns.regplot(x='Average_Cost_for_two',y='Aggregate_rating',data=rating)
      rating[["Average_Cost_for_two", "Aggregate_rating"]].corr()
      #Average cost for two is a weak positive factor to decide the rating of a␣
       ↪restaurant
```

```
[45]:                       Average_Cost_for_two  Aggregate_rating
      Average_Cost_for_two               1.00000           0.05011
      Aggregate_rating                   0.05011           1.00000
```



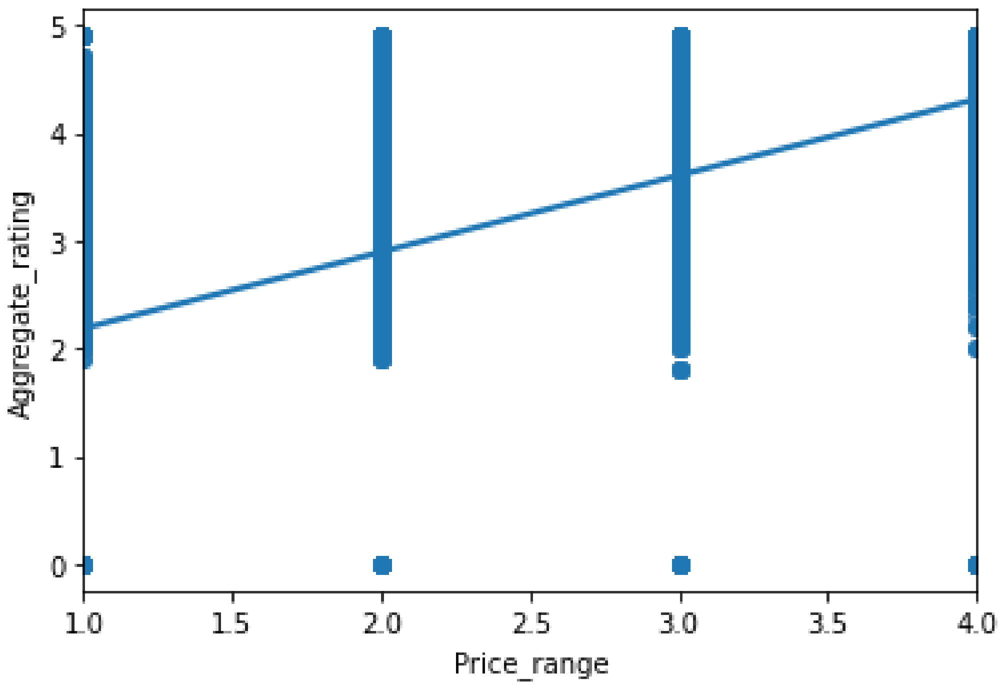
```
[46]: sns.regplot(x='Votes',y='Aggregate_rating',data=rating)
      rating[['Votes','Aggregate_rating']].corr()
      ##Average cost for two can be a factor to decide the rating of a restaurant
```

```
[46]:                      Votes  Aggregate_rating
      Votes             1.000000          0.318667
      Aggregate_rating  0.318667          1.000000
```



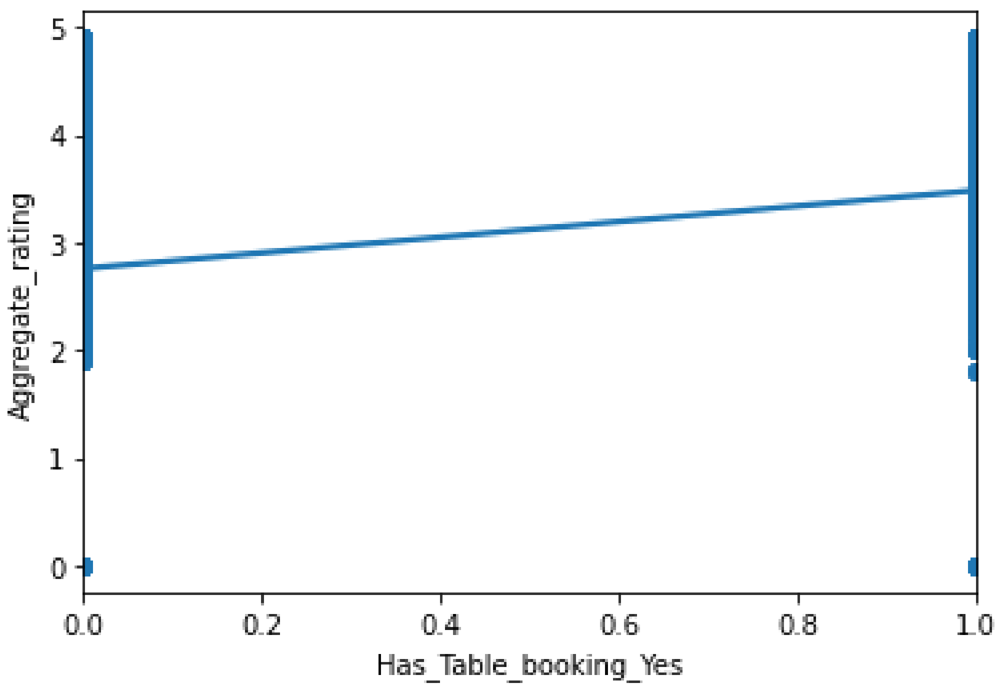
[47]:
```
abc = df_rest1[df_rest1['Has_Online_delivery_Yes'] == 1]['Aggregate_rating'].
  ↪mean()
xyz = df_rest1[df_rest1['Has_Online_delivery_Yes'] == 0]['Aggregate_rating'].
  ↪mean()
sns.regplot(x='Price_range',y='Aggregate_rating',data=rating)
rating[['Price_range','Aggregate_rating']].corr()
##Price range can be a factor to decide the rating of a restaurant
```

[47]:
```
                  Price_range  Aggregate_rating
Price_range          1.000000          0.462983
Aggregate_rating     0.462983          1.000000
```



[48]:
```
sns.regplot(x='Has_Table_booking_Yes',y='Aggregate_rating',data=rating)
rating[['Has_Table_booking_Yes','Aggregate_rating']].corr()
##Table booking can be a factor to decide the rating of a restaurant
```

[48]:
```
                       Has_Table_booking_Yes  Aggregate_rating
Has_Table_booking_Yes               1.000000          0.181843
Aggregate_rating                    0.181843          1.000000
```



```
[49]: max_rate = df_rest.sort_values(by='Aggregate_rating',ascending=False).
        ↪groupby(['Country','City'],as_index=False).first()
      #highest rating restaurants

      min_rate = df_rest.sort_values(by='Aggregate_rating',ascending=False).
        ↪groupby(['Country','City'],as_index=False).last()
      #lowest rating restaurants

      df_max=max_rate[['Country','City','Restaurant_Name','Aggregate_rating']] #new␣
        ↪dataframe created for high rated restaurants

      df_min=min_rate[['Country','City','Restaurant_Name','Aggregate_rating']] #new␣
        ↪dataframe created for low rated restaurants

      rating_rest=df_max.merge(df_min,left_on='City',right_on='City',how='inner')␣
        ↪#merge into single dataframe
```

```
[50]: rating_rest
```

```
[50]:      Country_x         City                       Restaurant_Name_x  \
      0    Australia    Armidale                       Whitebull Hotel
      1    Australia    Balingup                       Taste of Balingup
      2    Australia  Beechworth                     Bridge Road Brewers
      3    Australia Dicky Beach                       The Giggling Goat
```

```
4        Australia    East Ballina                         The Belle General
..             …             …                                     …
136  United States        Valdosta                          Smok'n Pig B-B-Q
137  United States        Vernonia                           Blue House Cafe
138  United States        Waterloo                     Four Queens Dairy Cream
139  United States         Weirton  Theo Yianni's Authentic Greek Restaurant
140  United States  Winchester Bay              Fishpatrick's Crabby Cafe

     Aggregate_rating_x      Country_y  \
0                   3.5      Australia
1                   3.2      Australia
2                   4.6      Australia
3                   3.6      Australia
4                   4.1      Australia
..                  …             …
136                 4.1  United States
137                 4.3  United States
138                 3.9  United States
139                 3.9  United States
140                 3.2  United States

                          Restaurant_Name_y  Aggregate_rating_y
0                            Whitebull Hotel                 3.5
1                          Taste of Balingup                 3.2
2                        Bridge Road Brewers                 4.6
3                          The Giggling Goat                 3.6
4                          The Belle General                 4.1
..                                       …                  …
136              El Toreo Mexican Restaurant                 3.1
137                          Blue House Cafe                 4.3
138              Masala Grill & Coffee House                 3.2
139  Theo Yianni's Authentic Greek Restaurant                3.9
140                Fishpatrick's Crabby Cafe                 3.2

[141 rows x 7 columns]
```

[51]:
```python
rating_rest.drop(columns='Country_y',axis=1,inplace=True)
rating_rest.columns = ['Country','City','Highest Rated Restaurant','Rating␣
  ↪Max','Lowest Rated Restaurant','Rating Min']
rating_rest
```

[51]:
```
           Country            City                  Highest Rated Restaurant  \
0        Australia        Armidale                           Whitebull Hotel
1        Australia        Balingup                         Taste of Balingup
2        Australia      Beechworth                       Bridge Road Brewers
3        Australia     Dicky Beach                         The Giggling Goat
4        Australia    East Ballina                         The Belle General
```

```
..            …             …                                       …
136  United States      Valdosta                         Smok'n Pig B-B-Q
137  United States      Vernonia                          Blue House Cafe
138  United States      Waterloo                     Four Queens Dairy Cream
139  United States       Weirton  Theo Yianni's Authentic Greek Restaurant
140  United States  Winchester Bay                 Fishpatrick's Crabby Cafe

     Rating Max                     Lowest Rated Restaurant  Rating Min
0           3.5                              Whitebull Hotel         3.5
1           3.2                            Taste of Balingup         3.2
2           4.6                          Bridge Road Brewers         4.6
3           3.6                             The Giggling Goat         3.6
4           4.1                             The Belle General         4.1
..          …                                          …          …
136         4.1                   El Toreo Mexican Restaurant         3.1
137         4.3                               Blue House Cafe         4.3
138         3.9                   Masala Grill & Coffee House         3.2
139         3.9  Theo Yianni's Authentic Greek Restaurant         3.9
140         3.2                     Fishpatrick's Crabby Cafe         3.2

[141 rows x 6 columns]
```

[ ]:
```
rating_rest_city_india=rating_rest[rating_rest['Country']=='India'] #storing␣
 ↪the dataframe only for country 'India'
rating_rest_city_india #In India
city=rating_rest_city_india['City'].tolist()#converting the series to list
rate_max=rating_rest_city_india['Rating Max'].tolist()#converting the series to␣
 ↪list
rate_min=rating_rest_city_india['Rating Min'].tolist()#converting the series to␣
 ↪list
rest_name_high=rating_rest_city_india['Highest Rated Restaurant'].
 ↪tolist()#converting the series to list
rest_name_low=rating_rest_city_india['Lowest Rated Restaurant'].tolist()
```

[ ]:
```
stack0 = go.Bar( # GroupBarChart 1 (Highest Rated Resturant)
    x=city,#x axis label
    y=rate_max,# y axis label
    text=rest_name_high,# the value of the restaurant
    name='Highest Rated Restaurant',
     marker=dict(
        color='rgb(76,153,0)', #color of the bar graph's marker
        line=dict(
            color='rgb(76,153,0)', #color of the bar graph's line
            width=1.5, #width of the bar graph
        )
    ),
    opacity=1.0
)
stack1 = go.Bar( # GroupBarChart 2 (Lowest Rated Resturant)
    x=city,
    y=rate_min,
    text=rest_name_low,
    name='Lowest Rated Restaurant',
     marker=dict(
        color='rgb(255,0,0)',#color of the bar graph's marker
        line=dict(
            color='rgb(255,0,0)',#color of the bar graph's line
            width=1.5, #width of the bar graph
        )
    ),
    opacity=1.0
)

data = [stack0,stack1]
layout = go.Layout(
    legend=dict( #the layout of the graph( beautification)
        x=0,
        y=1,
        traceorder='normal',
        font=dict(
            family='sans-serif',
            size=12,
            color='#000'
        ),
        bgcolor='#E2E2E2',
        bordercolor='#FFFFFF',
        borderwidth=2
    ),
    autosize=False,
    width=1000, # size of the graph
    height=450,
    barmode='group',
    title="Graph 1.1: Restaurants rating of India <br>\
    <i>hover with cursor to see restaurant's name</i>", #title of the graph
    plot_bgcolor='rgba(245, 246, 249, 1)',
    xaxis=dict(tickangle=-45,title= 'City of India'), #making the graphs label␣
 ↪inclined at 45 deg
    yaxis= {'title': 'Rating(scale of 5)'} #label of y-axis
)
fig = go.Figure(data=data, layout=layout) #plotting the graph
iplot(fig, filename='style-barbar')
```

```
[1]: stack0 = go.Bar( # GroupBarChart 1 (Highest Rated Resturant)
         x=cityu,#x axis label
```

```
    y=rate_maxu,# y axis label
    text=rest_name_highu,# the value of the restaurant
    name='Highest Rated Restaurant',
     marker=dict(
        color='rgb(76,153,0)', #color of the bar graph's marker
        line=dict(
            color='rgb(76,153,0)', #color of the bar graph's line
            width=1.5, #width of the bar graph
        )
    ),
    opacity=1.0
)
stack1 = go.Bar( # GroupBarChart 2 (Lowest Rated Resturant)
    x=cityu,
    y=rate_minu,
    text=rest_name_lowu,
    name='Lowest Rated Restaurant',
     marker=dict(
        color='rgb(255,0,0)',#color of the bar graph's marker
        line=dict(
            color='rgb(255,0,0)',#color of the bar graph's line
            width=1.5, #width of the bar graph
        )
    ),
    opacity=1.0
)

data = [stack0,stack1]
layout = go.Layout(
    legend=dict( #the layout of the graph( beautification)
        x=0,
        y=1,
        traceorder='normal',
        font=dict(
            family='sans-serif',
            size=12,
            color='#000'
        ),
        bgcolor='#E2E2E2',
        bordercolor='#FFFFFF',
        borderwidth=2
    ),
    autosize=False,
    width=1000, # size of the graph
    height=450,
    barmode='group',
    title="Graph 1.1: Restaurants rating of USA <br>\
    <i>hover with cursor to see restaurant's name</i>", #title of the graph
    plot_bgcolor='rgba(245, 246, 249, 1)',
    xaxis=dict(tickangle=-45,title= 'City of USA'), #making the graphs label␣
 ↪inclined at 45 deg
    yaxis= {'title': 'Rating(scale of 5)'} #label of y-axis
)
fig = go.Figure(data=data, layout=layout) #plotting the graph
iplot(fig, filename='style-barbar')
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-1-ffc20ab462e9> in <module>
----> 1 stack0 = go.Bar( # GroupBarChart 1 (Highest Rated Resturant)

      2     x=cityu,#x axis label
      3     y=rate_maxu,# y axis label
      4     text=rest_name_highu,# the value of the restaurant
      5     name='Highest Rated Restaurant',

NameError: name 'go' is not defined
```

[54]:
```
df_rest1 = df_rest.copy()
df_rest1.columns
```

[54]:
```
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', 'Price_range', 'Aggregate_rating',
       'Rating_color', 'Rating_text', 'Votes', 'Country'],
      dtype='object')
```

[55]:
```
dummy = ['Has_Table_booking','Has_Online_delivery']
df_rest1 = pd.get_dummies(df_rest1,columns=dummy,drop_first=True)
df_rest1.head()
# 0 indicates 'NO'
# 1 indicates 'YES'
```

[55]:
```
   Restaurant_ID             Restaurant_Name  Country_Code     City  \
0        7402935                        Skye            94  Jakarta
1        7410290     Satoo - Hotel Shangri-La            94  Jakarta
2        7420899                  Sushi Masa            94  Jakarta
3        7421967              3 Wise Monkeys            94  Jakarta
4        7422489  Avec Moi Restaurant and Bar            94  Jakarta

                                             Address  \
0  Menara BCA, Lantai 56, Jl. MH. Thamrin, Thamri…
1                Hotel Shangri-La, Jl. Jend. Sudirman
```

```
2                  Jl. Tuna Raya No. 5, Penjaringan
3               Jl. Suryo No. 26, Senopati, Jakarta
4  Gedung PIC, Jl. Teluk Betung 43, Thamrin, Jakarta

                      Locality                        Locality_Verbose  \
0  Grand Indonesia Mall, Thamrin  Grand Indonesia Mall, Thamrin, Jakarta
1     Hotel Shangri-La, Sudirman     Hotel Shangri-La, Sudirman, Jakarta
2                    Penjaringan                    Penjaringan, Jakarta
3                       Senopati                       Senopati, Jakarta
4                        Thamrin                        Thamrin, Jakarta

    Longitude  Latitude                     Cuisines  Average_Cost_for_two  \
0  106.821999 -6.196778        Italian, Continental                800000
1  106.818961 -6.203292  Asian, Indonesian, Western                800000
2  106.800144 -6.101298             Sushi, Japanese                500000
3  106.813400 -6.235241                    Japanese                450000
4  106.821023 -6.196270             French, Western                350000

                 Currency  Price_range  Aggregate_rating Rating_color  \
0  Indonesian Rupiah(IDR)            3               4.1        Green
1  Indonesian Rupiah(IDR)            3               4.6   Dark Green
2  Indonesian Rupiah(IDR)            3               4.9   Dark Green
3  Indonesian Rupiah(IDR)            3               4.2        Green
4  Indonesian Rupiah(IDR)            3               4.3        Green

  Rating_text  Votes    Country  Has_Table_booking_Yes  \
0   Very Good   1498  Indonesia                      0
1   Excellent    873  Indonesia                      0
2   Excellent    605  Indonesia                      0
3   Very Good    395  Indonesia                      0
4   Very Good    243  Indonesia                      0

   Has_Online_delivery_Yes
0                       0
1                       0
2                       0
3                       0
4                       0
```