```
i
```

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

Importing and inspecting data

```
df=pd.read_excel("Resturant.xlsx")
```

```
df1=pd.read_excel("Country-Code.xlsx")
```

```
df.head()
```

```
   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
```

```
df_original = df.copy()
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9551 entries, 0 to 9550
Data columns (total 19 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
dtypes: float64(3), int64(5), object(11)
memory usage: 1.4+ MB
```

```
df.columns
```

```
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'],
      dtype='object')
```

```
df.describe()
```

```
       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
```

```
df.size
```

```
181469
```

```
df.shape
```

```
(9551, 19)
```

```
df.isnull().sum()
```

```
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
dtype: int64
```

```
df.duplicated().sum()
```

```
0
```

```
(df==0).sum()
```

```
Restaurant ID              0
Restaurant Name            0
Country Code               0
City                       0
Address                    0
Locality                   0
Locality Verbose           0
```

```
Longitude                498
Latitude                 498
Cuisines                   0
Average Cost for two      18
Currency                   0
Has Table booking          0
Has Online delivery        0
Price range                0
Aggregate rating        2148
Rating color               0
Rating text                0
Votes                   1094
dtype: int64
```

Based on the findings from the previous questions, identify duplicates and remove

```
df=df.dropna()
```

```
df.isnull().sum()
```

```
Restaurant ID           0
Restaurant Name         0
Country Code            0
City                    0
Address                 0
Locality                0
Locality Verbose        0
Longitude               0
Latitude                0
Cuisines                0
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
dtype: int64
```

```
df.shape
```

```
(9541, 19)
```

missing values for longitude_n_latitude.

```
missing_city = df[(df.Longitude ==0)|(df.Latitude ==
0) ].City.unique()
len(missing_city)
```

```
0
```

filling missing values using city names

```
lat_n_long = df.groupby('City').agg('mean')
[['Latitude','Longitude']].loc[missing_city]
missing_city_loc = {x:tuple(lat_n_long.loc[x]) for x in missing_city}
((df.Latitude == 0) | (df.Longitude == 0)).sum()
```

```
499
```

```
len(lat_n_long)
```

```
28
```

```
for i in df.index:
    if (df.loc[i,'Latitude'] == 0) or (df.loc[i , 'Longitude'] == 0):
        city = df.loc[i , 'City']
        lat, long = missing_city_loc[city]
        df.loc[i,'Latitude'] = lat
        df.loc[i,'Longitude'] = long
```

```
((df.Latitude == 0) | (df.Longitude == 0)).sum()
```

```
0
```

Performing EDA

```
df1.head()
```

```
   Country Code    Country
0             1      India
1            14  Australia
2            30     Brazil
3            37     Canada
4            94  Indonesia
```

Replace columns shape by under_score.

```
df.columns= df.columns.str.replace(' ','_')
df1.columns = df1.columns.str.replace(' ','_')
```

```
df = pd.merge(df, df1, on='Country_Code')
```

```
df.head()
```

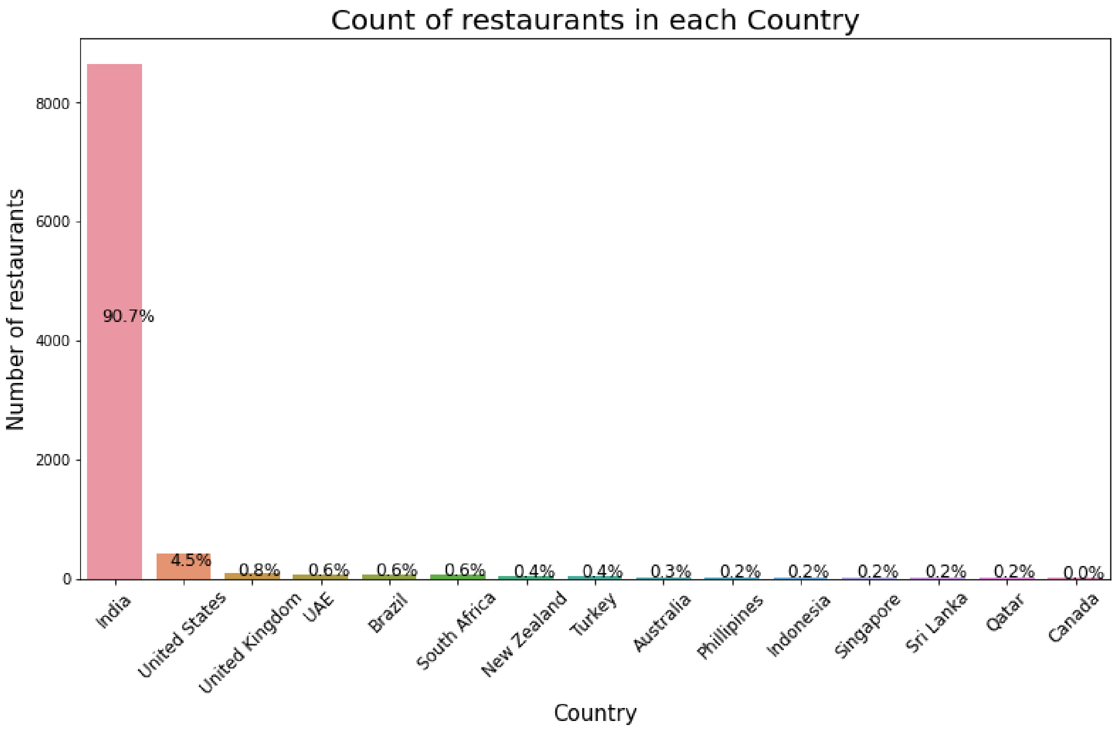
```
   Restaurant_ID              Restaurant_Name  Country_Code
City  \
0        7402935                         Skye            94  Jakarta

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
```

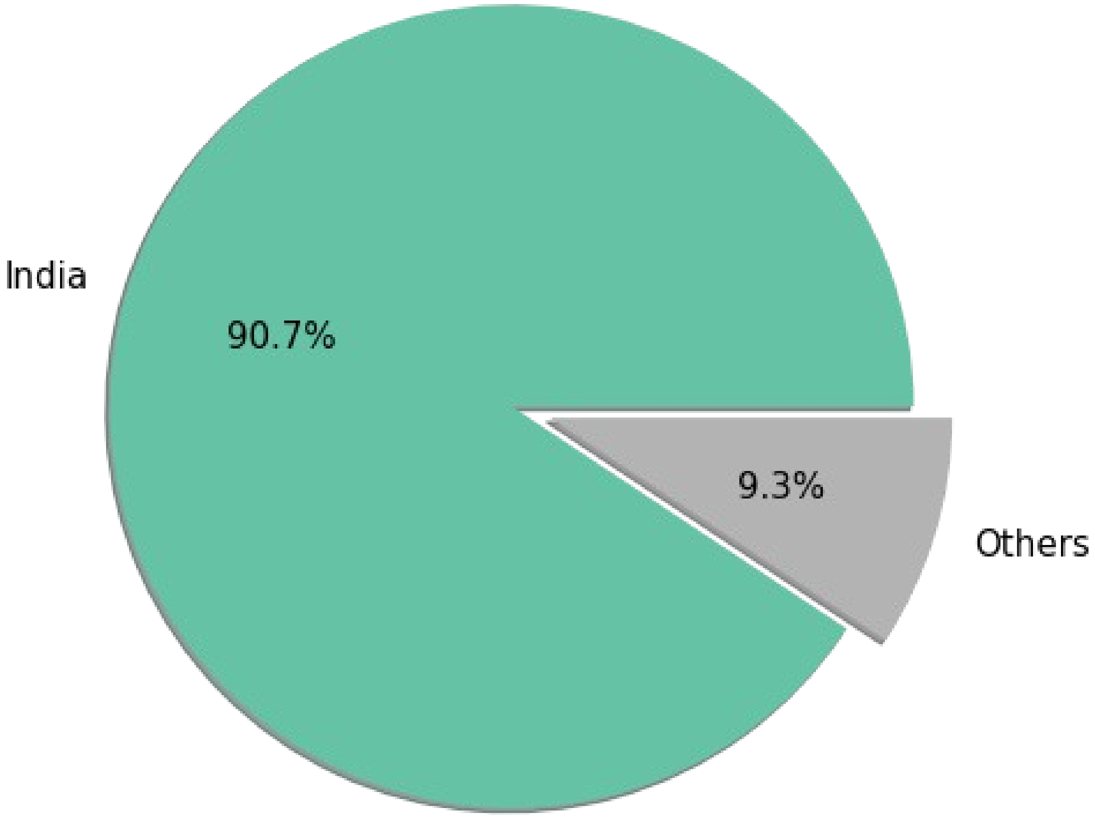
Explore the geographical distribution of the restaurants and identify the cities with the maximum and minimum number of restaurants

```
vc =
pd.DataFrame(df.Country.value_counts()).rename({'Country':'Freq'},
axis=1)
vc['Perc'] = (vc.Freq/vc.Freq.sum()*100).round(1)

plt.figure(figsize=(13,7))
sns.countplot(x='Country', data=df , order=vc.index)

for i in range(len(vc)):
    plt.annotate(str(vc.Perc[i]) +'%', xy = (i -0.2,
int(vc.Freq[i]/2)), fontsize=12)
plt.xticks(size=12, rotation=45)
plt.xlabel('Country', size = 15)
plt.ylabel('Number of restaurants', size = 15)
plt.title('Count of restaurants in each Country', size=20)
plt.show()
```



```
vc = pd.Series()
vc['India'] = len(df[df.Country == 'India'])
vc['Others'] = len(df[df.Country != 'India'])
vc.plot.pie(radius = 2,autopct = '%1.1f%%' , textprops = {'size':15 },
explode= [0.1,0.1], shadow = True, cmap ='Set2')
plt.xticks(size = 12, rotation = 10)
plt.ylabel('')
plt.show()
```

```
/usr/local/lib/python3.7/site-packages/ipykernel_launcher.py:1:
DeprecationWarning: The default dtype for empty Series will be
'object' instead of 'float64' in a future version. Specify a dtype
explicitly to silence this warning.
  """Entry point for launching an IPython kernel.
```



----->in the overall data Appx.91% of data contains India's market. So from now drop others country data and focus only on India's data.

```
df = df[df.Country=='India']
```

```
df.head()
```

```
    Restaurant_ID                                    Restaurant_Name
Country_Code  \
21          2701           Orient Express - Taj Palace Hotel
1
```

```
22         309548    Tian - Asian Cuisine Studio - ITC Maurya
1
23           2742                        Bukhara - ITC Maurya
1
24         301523  Nostalgia at 1911 Brasserie - The Imperial
1
25           2724                          1911 - The Imperial
1

         City                                            Address  \
21  New Delhi  Taj Palace Hotel, Diplomatic Enclave, Chanakya...
22  New Delhi  ITC Maurya, Diplomatic Enclave, Chanakyapuri, ...
23  New Delhi               ITC Maurya, Chanakyapuri, New Delhi
24  New Delhi                  The Imperial, Janpath, New Delhi
25  New Delhi                  The Imperial, Janpath, New Delhi

                              Locality  \
21  The Taj Palace Hotel, Chanakyapuri
22            ITC Maurya, Chanakyapuri
23            ITC Maurya, Chanakyapuri
24               The Imperial, Janpath
25               The Imperial, Janpath

                                 Locality_Verbose  Longitude
Latitude  \
21  The Taj Palace Hotel, Chanakyapuri, New Delhi  77.170087
28.595008
22            ITC Maurya, Chanakyapuri, New Delhi  77.173455
28.597351
23            ITC Maurya, Chanakyapuri, New Delhi  77.173724
28.597466
24               The Imperial, Janpath, New Delhi  77.218187
28.625445
25               The Imperial, Janpath, New Delhi  77.218185
28.625443

                                        Cuisines  Average_Cost_for_two
\
21                                      European                  8000

22        Asian, Japanese, Korean, Thai, Chinese                  7000

23                                  North Indian                  6500

24                          European, Continental                  6000

25  North Indian, Chinese, South Indian, Italian                  6000
```

```
              Currency Has_Table_booking Has_Online_delivery
Price_range  \
21  Indian Rupees(Rs.)               Yes                  No
4
22  Indian Rupees(Rs.)                No                  No
4
23  Indian Rupees(Rs.)                No                  No
4
24  Indian Rupees(Rs.)               Yes                  No
4
25  Indian Rupees(Rs.)               Yes                  No
4

    Aggregate_rating Rating_color Rating_text  Votes Country
21               4.0        Green   Very Good    145   India
22               4.1        Green   Very Good    188   India
23               4.4        Green   Very Good   2826   India
24               3.2       Orange     Average     12   India
25               3.9       Yellow        Good    272   India
```

```
print("All unique cities of restaurants in India")
df.City.unique()
```

```
All unique cities of restaurants in India

array(['New Delhi', 'Gurgaon', 'Agra', 'Noida', 'Kanpur', 'Ghaziabad',
       'Jaipur', 'Bangalore', 'Chandigarh', 'Pune', 'Chennai', 'Goa',
       'Hyderabad', 'Indore', 'Lucknow', 'Ludhiana', 'Panchkula',
       'Ranchi', 'Faridabad', 'Kolkata', 'Ahmedabad', 'Aurangabad',
       'Bhopal', 'Mysore', 'Vizag', 'Guwahati', 'Dehradun',
'Mangalore',
       'Nagpur', 'Patna', 'Bhubaneshwar', 'Coimbatore', 'Kochi',
'Mumbai',
       'Nashik', 'Puducherry', 'Surat', 'Vadodara', 'Amritsar',
       'Varanasi', 'Allahabad', 'Secunderabad', 'Mohali'],
dtype=object)
```

```
print("Count of restaurants at unique Cities")
City_Count=df['City'].value_counts().sort_values(ascending=True)
City_Count
```

```
Count of restaurants at unique Cities

Mohali              1
Panchkula           1
Secunderabad        2
Hyderabad          18
Chandigarh         18
Mangalore          20
Varanasi           20
Nashik             20
```

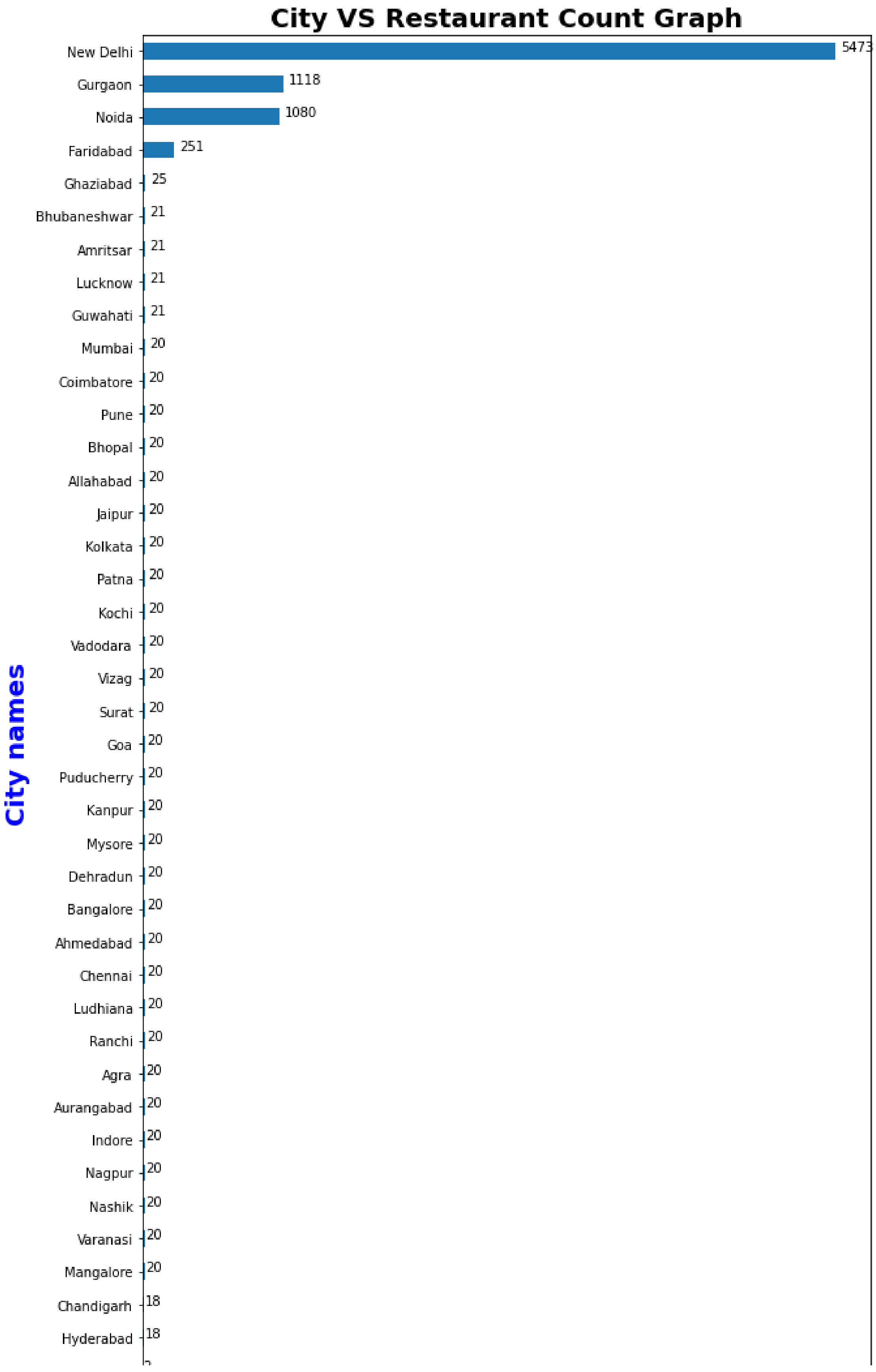
```
Nagpur              20
Indore              20
Aurangabad          20
Agra                20
Ranchi              20
Ludhiana            20
Chennai             20
Ahmedabad           20
Bangalore           20
Dehradun            20
Mysore              20
Kanpur              20
Puducherry          20
Goa                 20
Surat               20
Vizag               20
Vadodara            20
Kochi               20
Patna               20
Kolkata             20
Jaipur              20
Allahabad           20
Bhopal              20
Pune                20
Coimbatore          20
Mumbai              20
Guwahati            21
Lucknow             21
Amritsar            21
Bhubaneshwar        21
Ghaziabad           25
Faridabad          251
Noida             1080
Gurgaon           1118
New Delhi         5473
Name: City, dtype: int64
```

checking maximum count and Minimun count

```
print("Maximum number of Resaturants Present at:")
count_max=max(City_Count)
for x,y in City_Count.items():
    if(y==count_max):
        print(x)

print("Minimum number of Resaturants Present at:")
count_min=min(City_Count)
for x,y in City_Count.items():
    if(y==count_min):
        print(x)
```

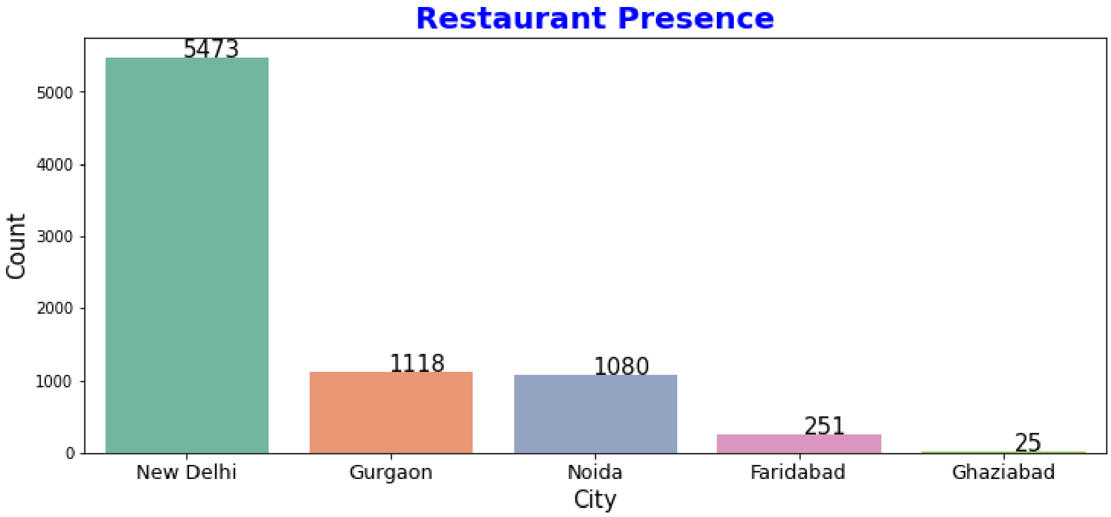
```
Maximum number of Resaturants Present at:
New Delhi
Minimum number of Resaturants Present at:
Mohali
Panchkula
```

```python
fig=plt.figure(figsize=(10,20))
City_Count.plot(kind="barh",fontsize=10)
plt.ylabel("City names",fontsize=20,color="blue",fontweight='bold')
plt.title("City VS Restaurant Count
Graph",fontsize=20,color="BLACK",fontweight='bold')
for v in range(len(City_Count)):

plt.text(v+City_Count[v],v,City_Count[v],fontsize=10,color="BLACK")
```


City VS Restaurant Count Graph
City names
New Delhi 5473
Gurgaon 1118
Noida 1080
Faridabad 251
Ghaziabad 25
Bhubaneshwar 21
Amritsar 21
Lucknow 21
Guwahati 21
Mumbai 20
Coimbatore 20
Pune 20
Bhopal 20
Allahabad 20
Jaipur 20
Kolkata 20
Patna 20
Kochi 20
Vadodara 20
Vizag 20
Surat 20
Goa 20
Puducherry 20
Kanpur 20
Mysore 20
Dehradun 20
Bangalore 20
Ahmedabad 20
Chennai 20
Ludhiana 20
Ranchi 20
Agra 20
Aurangabad 20
Indore 20
Nagpur 20
Nashik 20
Varanasi 20
Mangalore 20
Chandigarh 18
Hyderabad 18

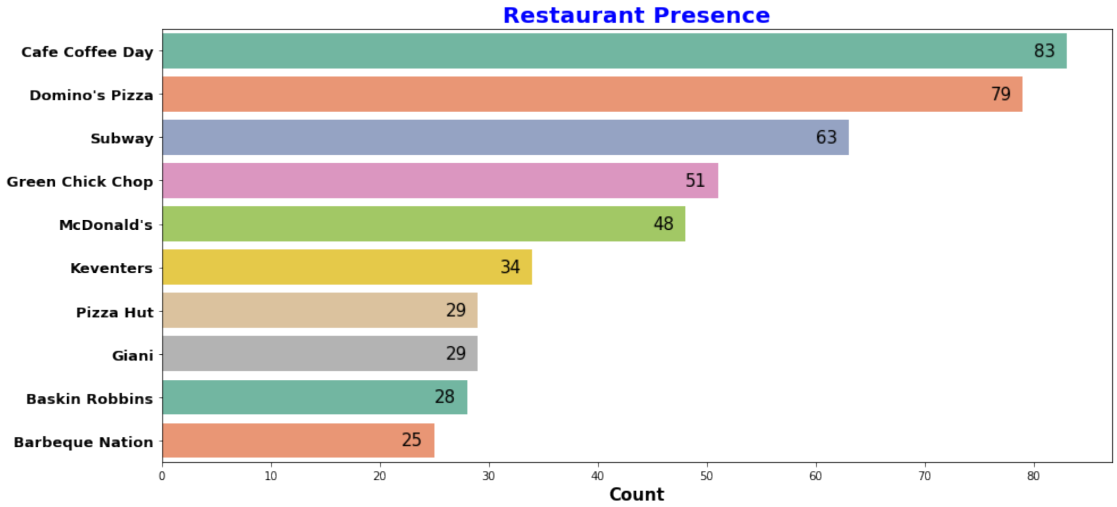
Restaurant franchise is a thriving venture. So, it becomes very important to explore the franchise with most national presence

```
plt.figure(figsize = (12,5))
vc = df.City.value_counts()[:5]
g = sns.barplot(x = vc.index, y = vc.values, palette = 'Set2')
g.set_xticklabels(g.get_xticklabels(),fontsize = 13)
for i in range(5):
    value = vc[i]
    g.text(y = value - 2,x = i +0.125 , s = value, color='black',
ha="center",fontsize = 15)
g.set_ylabel('Count', fontsize = 15)
g.set_xlabel('City', fontsize=15)
g.set_title('Restaurant Presence', fontsize = 20, color =
'blue',fontweight='bold')
plt.show()
```



----->It is already knew that India has the largest market in this data, on that New Delhi has the most number of restaurants followed by Gurgaon, Noida, Faridabad, Ghaziabad. Remaining cities has less number of restaurants which are not noticable.

```
plt.figure(figsize = (15,7))
vc = df.Restaurant_Name.value_counts()[:10]
g = sns.barplot(y = vc.index, x = vc.values, palette = 'Set2')
g.set_yticklabels(g.get_yticklabels(),fontsize = 13,fontweight='bold')
for i in range(10):
    value = vc[i]
    g.text(x = value - 2,y = i +0.125 , s = value, color='black',
ha="center",fontsize = 15)
g.set_xlabel('Count', fontsize = 15,fontweight='bold')
g.set_title('Restaurant Presence', fontsize = 20, color =
'blue',fontweight='bold')
plt.show()
```



The ratio between restaurants that allow table booking vs. those that do not allow table booking

```
print("No. of restaurants with table booking facility:")
(df.Has_Table_booking== 'Yes').sum()
```

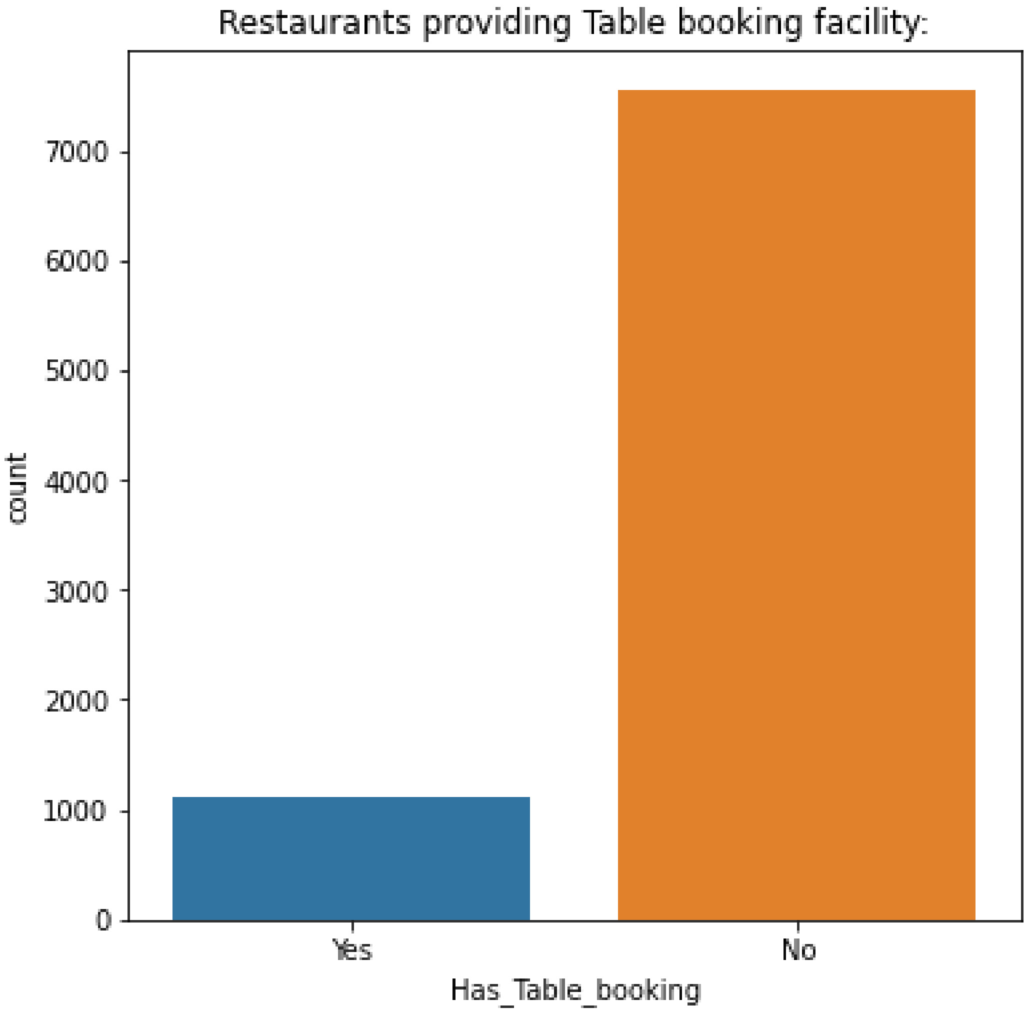
```
No. of restaurants with table booking facility:

1111
```

```
print("No. of restaurants which does not provide table booking facility:")
(df.Has_Table_booking== 'No').sum()
```

```
No. of restaurants which does not provide table booking facility:

7540
```

```
sns.countplot(x=df['Has_Table_booking'])
fig = plt.gcf()
fig.set_size_inches(6,6)
plt.title('Restaurants providing Table booking facility:')
```

```
Text(0.5, 1.0, 'Restaurants providing Table booking facility:')
```



percentage of restaurants providing online delivery

```
print("No. of restaurants with online delivery:")
(df.Has_Online_delivery == 'Yes').sum()
```

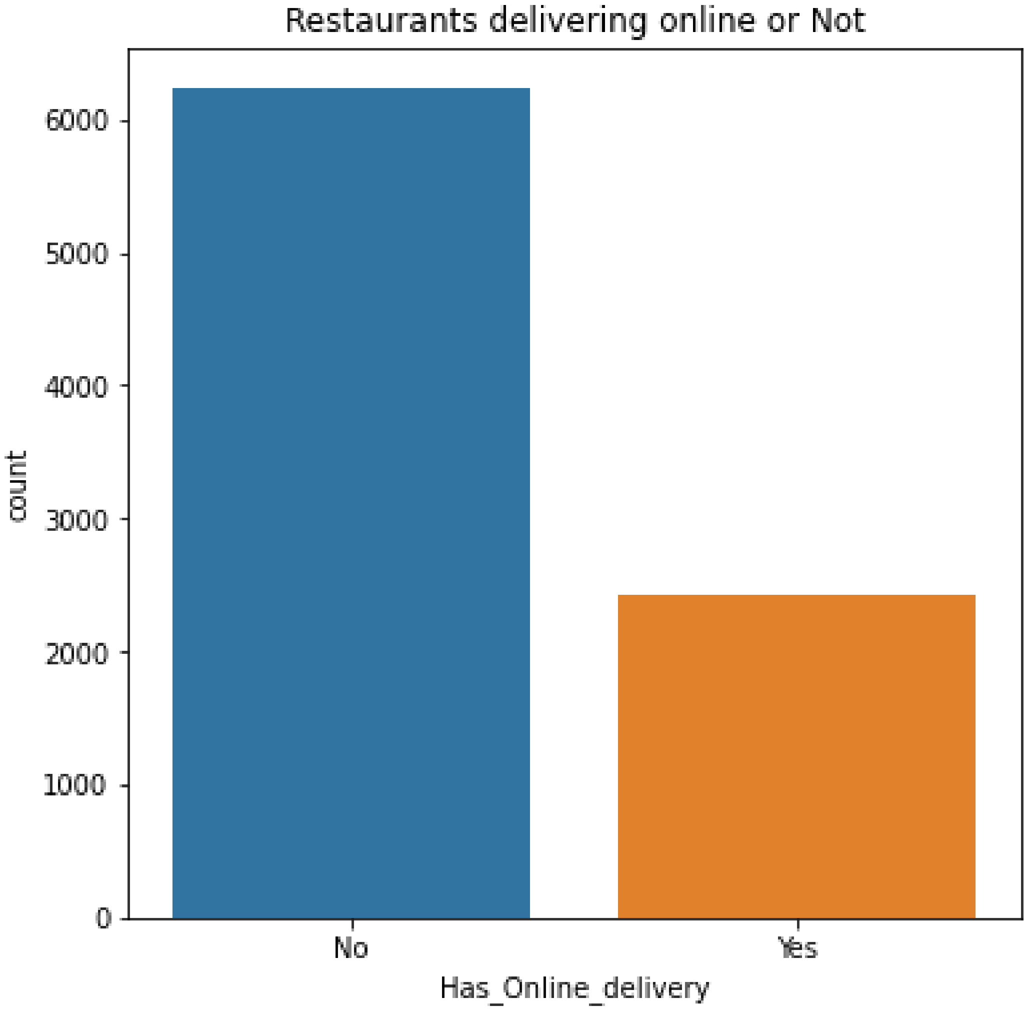
```
No. of restaurants with online delivery:

2423
```

```
print("No. of restaurants which does not delivery online:")
(df.Has_Online_delivery == 'No').sum()
```

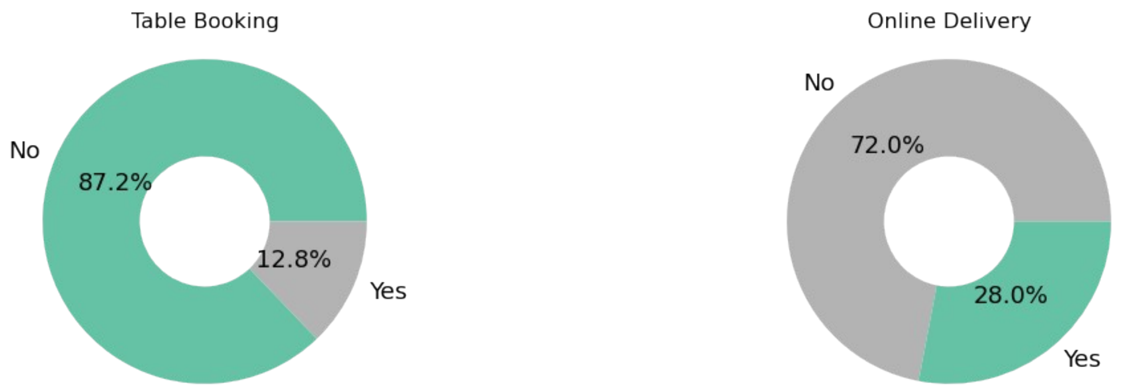
```
No. of restaurants which does not delivery online:

6228
```

```
sns.countplot(x=df['Has_Online_delivery'])
fig = plt.gcf()
fig.set_size_inches(6,6)
plt.title('Restaurants delivering online or Not')
```

```
Text(0.5, 1.0, 'Restaurants delivering online or Not')
```



```
f,axes = plt.subplots(1,2,figsize = (15,5))
df.Has_Table_booking.value_counts().plot.pie(ax = axes[0],autopct =
'%0.1f%%', radius = 1.25, wedgeprops = {'width' : 0.75}, cmap =
'Set2',
textprops = {'size' : 18,} )
axes[0].set_title('Table Booking\n',fontsize = 16)
axes[0].set_ylabel('')
df.Has_Online_delivery.value_counts().plot.pie(ax = axes[1], autopct =
'%0.1f%%', radius = 1.25,wedgeprops = {'width' : 0.75}, cmap =
'Set2_r',
textprops = {'size' : 18} )
axes[1].set_title('Online Delivery\n', fontsize = 16)
axes[1].set_ylabel('')
plt.tight_layout(w_pad = 20, h_pad = 10, pad = 4)
plt.show()
```



```
pd.crosstab(df.Has_Online_delivery,df.Has_Table_booking)
```

```
Has_Table_booking      No  Yes
Has_Online_delivery
No                   5544  684
Yes                  1996  427
```

Calculation of the difference in number of votes for the restaurants that deliver and the restaurants that do not deliver

```
Number_of_votes = df.groupby('Has_Online_delivery')['Votes'].sum()
Number_of_votes
```

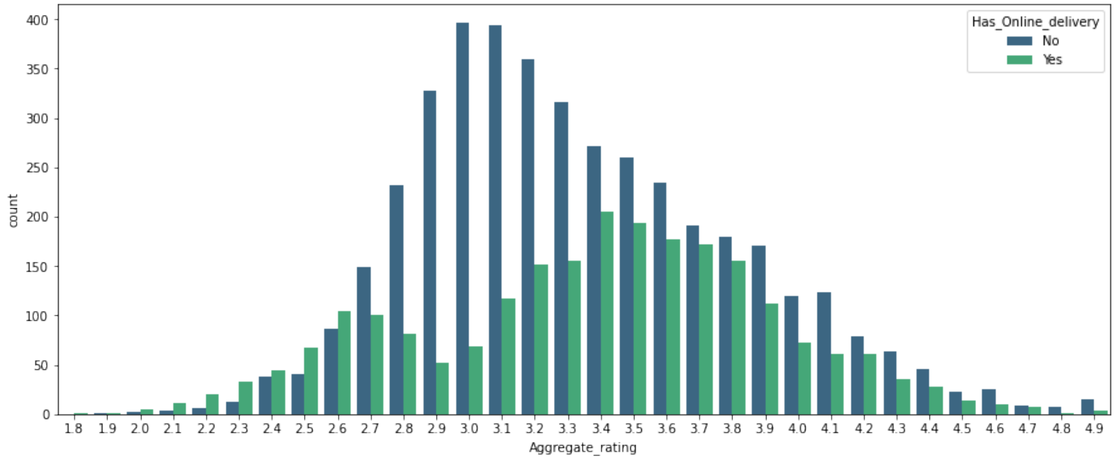
```
Has_Online_delivery
No     679780
Yes    506614
Name: Votes, dtype: int64
```

```
print('number of votes for the restaurants that deliver and the 
restaurants that do not deliver :',Number_of_votes[0] - 
Number_of_votes[1])
```

```
number of votes for the restaurants that deliver and the restaurants 
that do not deliver : 173166
```

difference of votes as per ratings

```
plt.figure(figsize=(15,6))
sns.countplot(data=df[df.Aggregate_rating !
=0],x='Aggregate_rating',hue='Has_Online_delivery',palette='viridis')
plt.show()
```



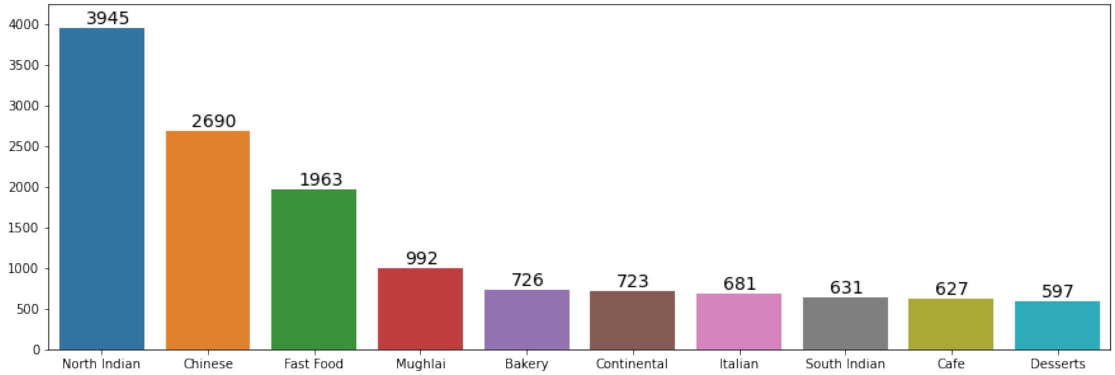
Top 10 cuisines which are served across cities

```
top10_City = df.City.value_counts()[:10]
top10_City
```

```
New Delhi       5473
Gurgaon         1118
Noida           1080
Faridabad        251
Ghaziabad         25
Bhubaneshwar      21
Amritsar          21
Lucknow           21
Guwahati          21
Jaipur            20
Name: City, dtype: int64
```

```
l = []
for i in df.Cuisines.str.split(','):
    l.extend(i)
s = pd.Series([i.strip() for i in l])
```

```
plt.figure(figsize = (15,5))
sns.barplot(x = s.value_counts()[:10].index, y = s.value_counts()
[:10])
for i in range(10):
    plt.annotate(s.value_counts()[i], xy = (i-0.15,s.value_counts()[i]
+50),fontsize = 14)
plt.ylim(0, round(s.value_counts()[0]+300))
plt.show()
```

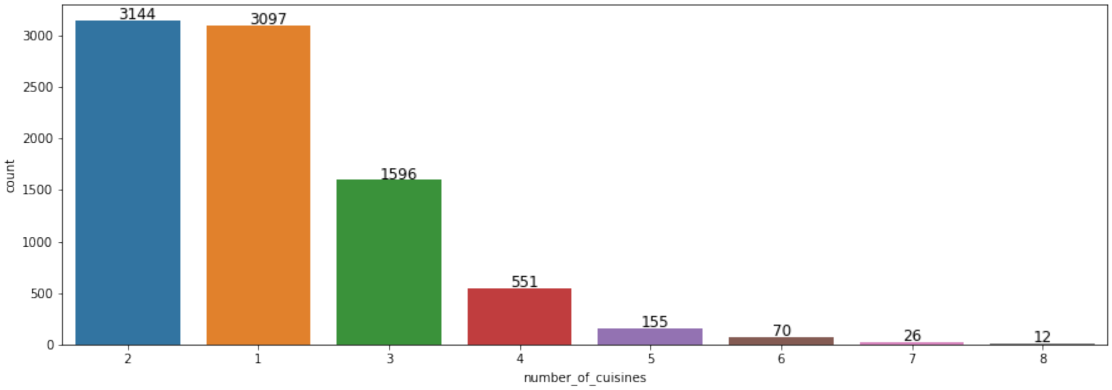


Maximum and minimum number of cuisines that a restaurant serves, along with most served cuisine across the restaurant for each city

```
df['number_of_cuisines'] = df.Cuisines.str.split(',').apply(len)
```

```
plt.figure(figsize = (15,5))
vc = df.number_of_cuisines.value_counts()
sns.countplot('number_of_cuisines', data=df, order = vc.index)
for i in range(len(vc)):
    plt.annotate(vc.iloc[i], xy = (i-0.07,vc.iloc[i]+10), fontsize =
12)
plt.show()
```

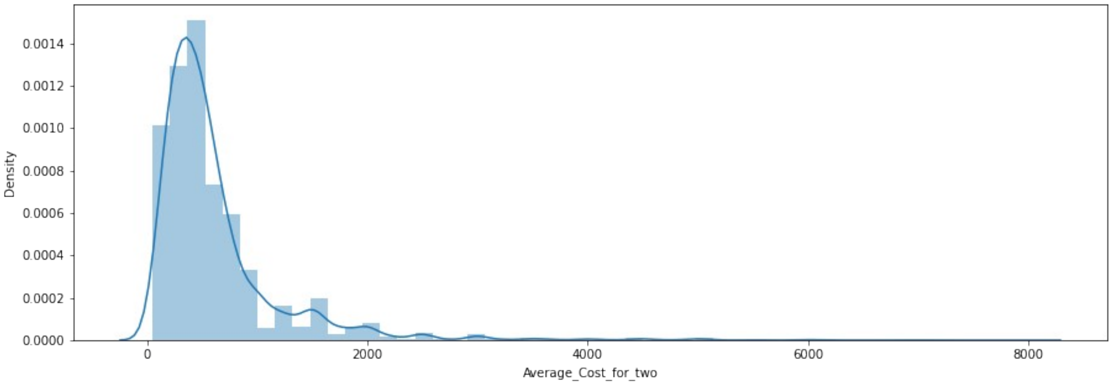
```
/usr/local/lib/python3.7/site-packages/seaborn/_decorators.py:43:
FutureWarning: Pass the following variable as a keyword arg: x. From
version 0.12, the only valid positional argument will be `data`, and
passing other arguments without an explicit keyword will result in an
error or misinterpretation.
  FutureWarning
```



Distribution cost across the restaurants

```
plt.figure(figsize = (15,5))
sns.distplot(df[df.Average_Cost_for_two != 0].Average_Cost_for_two)
plt.show()
```

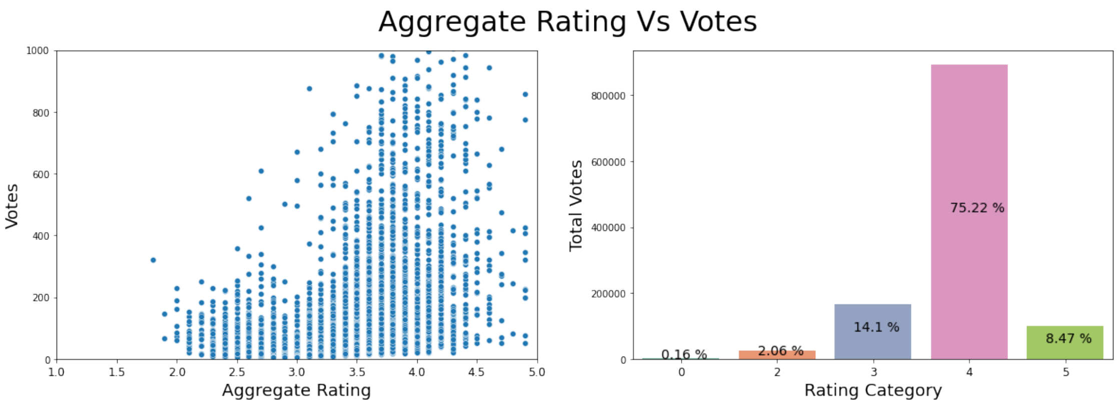
```
/usr/local/lib/python3.7/site-packages/seaborn/distributions.py:2619:
FutureWarning: `distplot` is a deprecated function and will be removed
in a future version. Please adapt your code to use either `displot` (a
figure-level function with similar flexibility) or `histplot` (an
axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```



How ratings are distributed among the various factors?

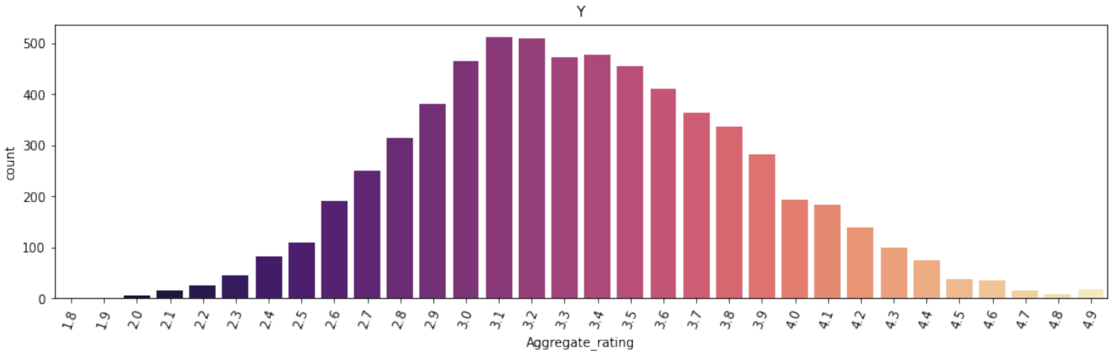
```
df['Rating_cat'] = df['Aggregate_rating'].round(0).astype(int)

f,ax = plt.subplots(1,2,figsize=(20,6))
sns.scatterplot(data=df,x='Aggregate_rating',y='Votes', ax = ax[0],
palette ='Set2')
agg = df.pivot_table(index = 'Rating_cat', values = 'Votes', aggfunc =
'sum').reset_index()
agg['Perc_votes']= (agg.Votes/agg.Votes.sum()*100).round(2)
sns.barplot(x = 'Rating_cat', y = 'Votes', data = agg, ax = ax[1],
palette='Set2')
for i in range(len(agg)):
    ax[1].annotate(str(agg.Perc_votes[i])+' %', xy = (i-
0.2,int(agg.Votes[i]/2)), fontsize = 14, fontweight = 'medium')
ax[0].set_ylim(0,1000)
ax[0].set_xlim(1,5)
ax[0].set_ylabel('Votes',fontsize = 18 )
ax[0].set_xlabel('Aggregate Rating',fontsize = 18 )
ax[0].set_xticklabels(ax[0].get_xticks(),fontsize = 12)
ax[1].set_ylabel('Total Votes',fontsize = 18 )
ax[1].set_xlabel('Rating Category',fontsize = 18 )
ax[1].set_xticklabels(agg.Rating_cat,fontsize = 12)
plt.suptitle('Aggregate Rating Vs Votes', size = 30)
plt.show()
```

```
/usr/local/lib/python3.7/site-packages/ipykernel_launcher.py:12:
UserWarning: FixedFormatter should only be used together with
FixedLocator
  if sys.path[0] == '':
```



```
plt.figure( figsize = (15, 4))
sns.countplot('Aggregate_rating', data = df[df.Aggregate_rating !=0] ,
palette = 'magma')
plt.tick_params('x', rotation = 70)
plt.title('Y')
plt.show()
```

```
/usr/local/lib/python3.7/site-packages/seaborn/_decorators.py:43:
FutureWarning: Pass the following variable as a keyword arg: x. From
version 0.12, the only valid positional argument will be `data`, and
passing other arguments without an explicit keyword will result in an
error or misinterpretation.
  FutureWarning
```



```
df["Rating_color"].value_counts()
Color_represents = df.groupby(['Rating_color'],as_index =False)
['Aggregate_rating'].mean()

Color_represents.columns = ['Rating_color','Average_rating']

Color_represents
=Color_represents.sort_values(by='Average_rating',ascending=False)

Color_represents = Color_represents[0:5]
Color_represents['Ratings'] = ['Excellent','Very
Good','Good','Okay','Poor']

Color_represents
```

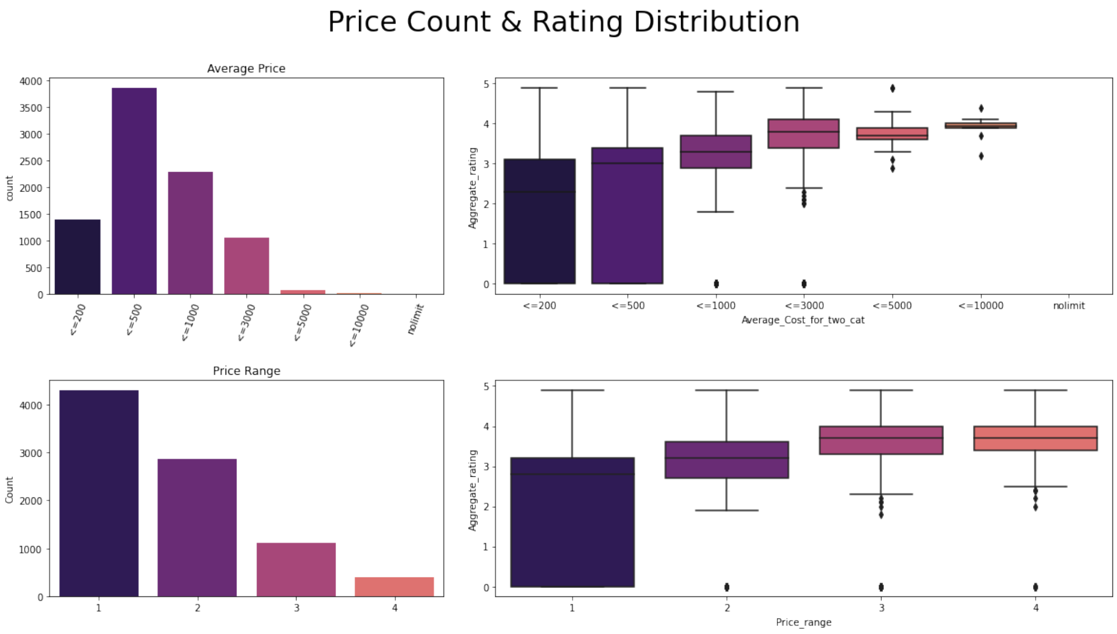
```
  Rating_color  Average_rating    Ratings
0   Dark Green        4.646552  Excellent
1        Green        4.153401  Very Good
5       Yellow        3.677423       Good
2       Orange        3.048722       Okay
3          Red        2.296111       Poor
```

Explaing the factors in the data that may have an effect on ratings. For example, number of cuisines, cost, delivery option, etc.

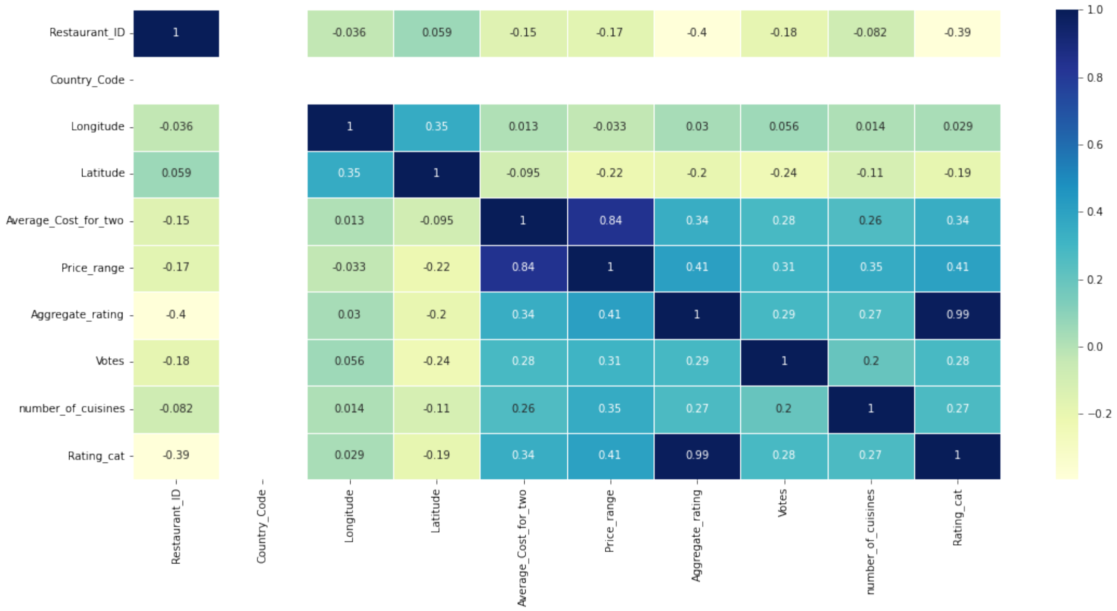
```
df['Average_Cost_for_two_cat']= pd.cut(df[df.Average_Cost_for_two !=
0].Average_Cost_for_two,
bins = [0, 200, 500, 1000, 3000, 5000,10000, 800000000],
labels = ['<=200', '<=500', '<=1000', '<=3000', '<=5000', '<=10000',
'nolimit'])
```

```
f = plt.figure(figsize = (20,10))
ax = plt.subplot2grid((2,5), (0,0),colspan = 2)
sns.countplot(df['Average_Cost_for_two_cat'], ax = ax, palette =
sns.color_palette('magma', 7))
ax.set_title('Average Price')
ax.set_xlabel('')
ax.tick_params('x', rotation = 70)
ax = plt.subplot2grid((2,5), (0,2), colspan = 3)
sns.boxplot(x = 'Average_Cost_for_two_cat', y = 'Aggregate_rating',
data =df, ax = ax, palette = sns.color_palette('magma', 7))
count = df['Price_range'].value_counts().reset_index()
count.columns = ['Price_range', 'Count']
ax = plt.subplot2grid((2,5), (1,0),colspan = 2)
sns.barplot(x = 'Price_range', y = 'Count', data = count, ax=ax,
palette = sns.color_palette('magma', 5))
ax.set_title('Price Range')
ax.set_xlabel('')
ax = plt.subplot2grid((2,5), (1,2), colspan = 3)
sns.boxplot(x='Price_range', y ='Aggregate_rating', data = df, ax =
ax, palette = sns.color_palette('magma', 5))
plt.subplots_adjust(wspace = 0.3, hspace = 0.4,)
plt.suptitle('Price Count & Rating Distribution', size = 30)
plt.show()
```

```
/usr/local/lib/python3.7/site-packages/seaborn/_decorators.py:43:
FutureWarning: Pass the following variable as a keyword arg: x. From
version 0.12, the only valid positional argument will be `data`, and
passing other arguments without an explicit keyword will result in an
error or misinterpretation.
  FutureWarning
```



```
fig, ax = plt.subplots(figsize=(18,8))
dataplot = sns.heatmap(df.corr(), cmap="YlGnBu",
annot=True,linewidth=0.5,ax=ax)
```



We see that there is no single variable that affects the rating strongly, however table booking,online delivery,avg price for two and price range, number of votes do play a part in affecting the rating of a restaurant.

Exporting merged data file to tableau for visualization

```
df.to_excel("df.xlsx")
```

Dashboarding

https://public.tableau.com/app/profile/suman.paria/viz/ResturantRating_16802015334550/Dashboard1?publish=yes