Zomato Dataset Practical EDA Implementation

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In [ ]:
```
#comment
#observations
```

In [98]:
```
## Importing Basic Libraries:-

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline         ## so that the images or vizualization are display in notebo
import warnings
warnings.filterwarnings('ignore')
```

```
UsageError: unrecognized arguments: # so that the images or vizualization are display in
notebook itself.
```

In [6]:
```
## Loading Zomato Dataset in Dataframe
df = pd.read_csv('zomato.csv', encoding = 'latin-1')
```

In [9]:
```
## Head() used to Display top 5 Rows of a dataset.
df.head()
```

Out[9]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	
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	1
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	1

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	
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	1
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.056475	1
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas...	SM Megamall, Ortigas, Mandaluyong City	SM Megamall, Ortigas, Mandaluyong City, Mandal...	121.057508	1

5 rows × 21 columns

In [10]:
```
## Checking All Column Available in a Dataset
df.columns
```

Out[10]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes'],
      dtype='object')
```

In [11]:
```
 ## one more way to understand a dataset is by df.info()
df.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
```

In [12]:
```
## Describes() is used to ckeck all Details of Statistics Method Related with All Numer
df.describe()
```

Out[12]:

	Restaurant ID	Country Code	Longitude	Latitude	Average Cost for two	Price range	Aggregate rating
count	9.551000e+03	9551.000000	9551.000000	9551.000000	9551.000000	9551.000000	9551.000000
mean	9.051128e+06	18.365616	64.126574	25.854381	1199.210763	1.804837	2.666370
std	8.791521e+06	56.750546	41.467058	11.007935	16121.183073	0.905609	1.516378
min	5.300000e+01	1.000000	-157.948486	-41.330428	0.000000	1.000000	0.000000
25%	3.019625e+05	1.000000	77.081343	28.478713	250.000000	1.000000	2.500000
50%	6.004089e+06	1.000000	77.191964	28.570469	400.000000	2.000000	3.200000
75%	1.835229e+07	1.000000	77.282006	28.642758	700.000000	2.000000	3.700000
max	1.850065e+07	216.000000	174.832089	55.976980	800000.000000	4.000000	4.900000

In [14]:
```
## To check all Rows And Columns available in Dataset
df.shape
```

Out[14]:
```
(9551, 21)
```

In Data Analysis Whats All Things We Do:-

1. Missing Values
2. Explore about the Numerical Variables
3. Explore About the categorical Variables
4. Finding Relationship Between Features.

In [15]:
```
## In Order to find the sum of Missing Value in respect to all Columns
df.isnull().sum()
```

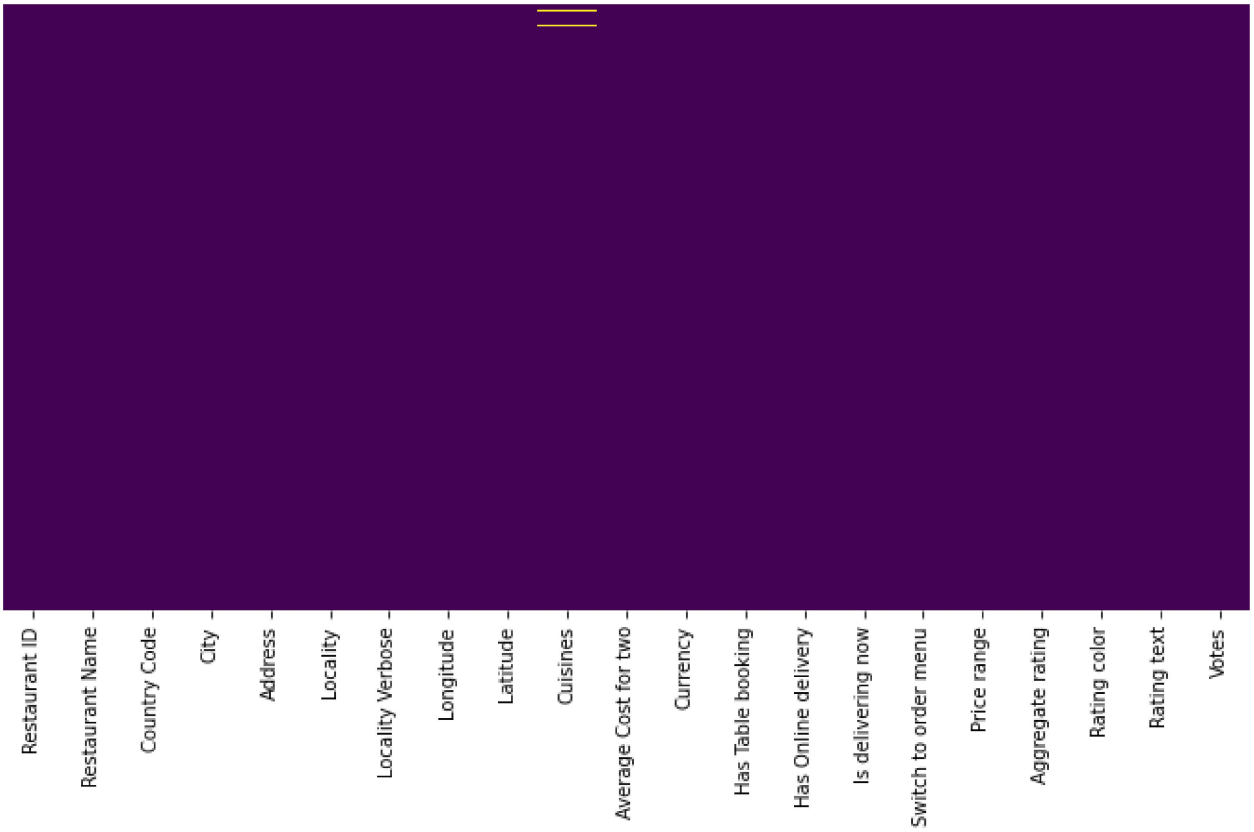
Out[15]:
```
Restaurant ID         0
Restaurant Name       0
Country Code          0
City                  0
Address               0
Locality              0
Locality Verbose      0
Longitude             0
Latitude              0
Cuisines              9
Average Cost for two  0
Currency              0
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
```

In [18]:
```
## Another ways to find the Missing values by using list Comprihension.
[features for features in df.columns if df[features].isnull().sum() >0]
```

Out[18]:
```
['Cuisines']
```

In [101…
```
## Another way of Finding Missing value is by using Heatmap.
sns.heatmap(df.isnull(),yticklabels=False, cbar= False, cmap= 'viridis')
```

Out[101…
```
<AxesSubplot:>
```



In [24]:
```
## Loading Another dataset in a dataframe:-
df_contry= pd.read_excel('Country-Code.xlsx')
```

In [25]:
```
 ## For checking top 5 Row from a dataset
df_contry.head()
```

Out[25]:

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

In [26]:
```
## For checking all columns Names Available in a dataset.
df.columns
```

Out[26]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes'],
      dtype='object')
```

In [33]:

```
## pd.merge() is used to Merge Two Dataframe in one
final_df = pd.merge(df,df_contry, on = 'Country Code', how ='left')
```

In [34]:

```
## for Checking top 3 rows from a dataset
final_df.head(3)
```

Out[34]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	L
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
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
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

3 rows × 22 columns

In [35]:

```
 ## Another way to check a data types.
final_df.dtypes
```

Out[35]:

```
Restaurant ID           int64
Restaurant Name        object
Country Code            int64
City                   object
Address                object
Locality               object
Locality Verbose       object
Longitude             float64
Latitude              float64
Cuisines               object
Average Cost for two    int64
Currency               object
Has Table booking      object
Has Online delivery    object
Is delivering now      object
Switch to order menu   object
```

```
Price range              int64
Aggregate rating       float64
Rating color            object
Rating text             object
Votes                    int64
Country                 object
dtype: object
```

In [36]:
```
## For Checking All Column Name Available in Dataset.
final_df.columns
```

Out[36]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes', 'Country'],
      dtype='object')
```

In [37]:
```
## With Respect to Country columns ,it is used to find totol value counts.
final_df.Country.value_counts()
```

Out[37]:
```
India             8652
United States      434
United Kingdom      80
Brazil              60
UAE                 60
South Africa        60
New Zealand         40
Turkey              34
Australia           24
Phillipines         22
Indonesia           21
Singapore           20
Qatar               20
Sri Lanka           20
Canada               4
Name: Country, dtype: int64
```

Observation :-

- Zamoto is mostly Available in India.

In [38]:
```
## In this Country Value Counted with the help of Indexing.
country_names = final_df.Country.value_counts().index
```

In [39]:
```
## Displaying the Value Store in Contry_name variables.
country_names
```

Out[39]:
```
Index(['India', 'United States', 'United Kingdom', 'Brazil', 'UAE',
       'South Africa', 'New Zealand', 'Turkey', 'Australia', 'Phillipines',
       'Indonesia', 'Singapore', 'Qatar', 'Sri Lanka', 'Canada'],
      dtype='object')
```

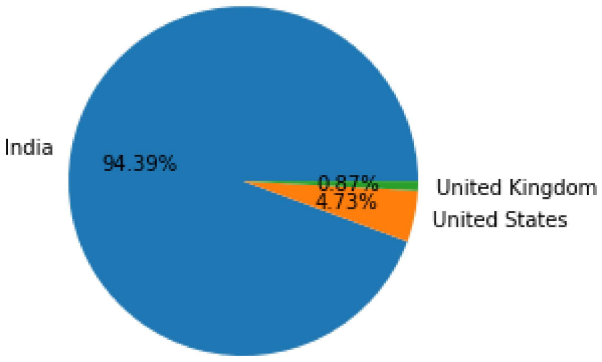
In [41]:
```
## In this Country Value Counted with the help of Value function.
country_val = final_df.Country.value_counts().values
```

In [42]:
```
## Displaying the Value Store in Contry_val variables.
country_val
```

Out[42]:
```
array([8652,  434,   80,   60,   60,   60,   40,   34,   24,   22,   21,
         20,   20,   20,    4], dtype=int64)
```

In [47]:
```
## Plotting Pie chart for - Top 3 countries that use zomato.
plt.pie(country_val[:3], labels = country_names[:3], autopct ='%1.2f%%')
```

Out[47]:
```
([<matplotlib.patches.Wedge at 0x29bed24bca0>,
  <matplotlib.patches.Wedge at 0x29bed25eac0>,
  <matplotlib.patches.Wedge at 0x29bed25e790>],
 [Text(-1.0829742700952103, 0.19278674827836725, 'India'),
  Text(1.077281715838356, -0.22240527134123297, 'United States'),
  Text(1.0995865153823035, -0.03015783794312073, 'United Kingdom')],
 [Text(-0.590713238233751, 0.10515640815183668, '94.39%'),
  Text(0.5876082086391032, -0.12131196618612707, '4.73%'),
  Text(0.5997744629358018, -0.01644972978715676, '0.87%')])
```



Observation :-

- Zomato maximum records or transaction are from India after that USA And then United Kingdoms

In [48]:
```
## Checking All the column name Available in a Dataset.
final_df.columns
```

Out[48]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes', 'Country'],
      dtype='object')
```

In [52]:
```
## We are Grouping the columns 'Aggregate rating', 'Rating color', 'Rating text' By usi
final_df.groupby(['Aggregate rating', 'Rating color', 'Rating text']).size()
```

Out[52]:
```
Aggregate rating  Rating color  Rating text
0.0               White         Not rated      2148
1.8               Red           Poor              1
```

```
1.9              Red          Poor              2
2.0              Red          Poor              7
2.1              Red          Poor             15
2.2              Red          Poor             27
2.3              Red          Poor             47
2.4              Red          Poor             87
2.5              Orange       Average         110
2.6              Orange       Average         191
2.7              Orange       Average         250
2.8              Orange       Average         315
2.9              Orange       Average         381
3.0              Orange       Average         468
3.1              Orange       Average         519
3.2              Orange       Average         522
3.3              Orange       Average         483
3.4              Orange       Average         498
3.5              Yellow       Good            480
3.6              Yellow       Good            458
3.7              Yellow       Good            427
3.8              Yellow       Good            400
3.9              Yellow       Good            335
4.0              Green        Very Good       266
4.1              Green        Very Good       274
4.2              Green        Very Good       221
4.3              Green        Very Good       174
4.4              Green        Very Good       144
4.5              Dark Green   Excellent        95
4.6              Dark Green   Excellent        78
4.7              Dark Green   Excellent        42
4.8              Dark Green   Excellent        25
4.9              Dark Green   Excellent        61
dtype: int64
```

In [53]:
```
## Adding New column at last as 'Rating count' by Renaming header 0 = 'Rating Count'
ratings = final_df.groupby(['Aggregate rating', 'Rating color', 'Rating text']).size().
```

In [54]:
```
## Displaying all the value which are store in rating variable.
ratings
```

Out[54]:

	Aggregate rating	Rating color	Rating text	Rating count
0	0.0	White	Not rated	2148
1	1.8	Red	Poor	1
2	1.9	Red	Poor	2
3	2.0	Red	Poor	7
4	2.1	Red	Poor	15
5	2.2	Red	Poor	27
6	2.3	Red	Poor	47
7	2.4	Red	Poor	87
8	2.5	Orange	Average	110
9	2.6	Orange	Average	191

	Aggregate rating	Rating color	Rating text	Rating count
10	2.7	Orange	Average	250
11	2.8	Orange	Average	315
12	2.9	Orange	Average	381
13	3.0	Orange	Average	468
14	3.1	Orange	Average	519
15	3.2	Orange	Average	522
16	3.3	Orange	Average	483
17	3.4	Orange	Average	498
18	3.5	Yellow	Good	480
19	3.6	Yellow	Good	458
20	3.7	Yellow	Good	427
21	3.8	Yellow	Good	400
22	3.9	Yellow	Good	335
23	4.0	Green	Very Good	266
24	4.1	Green	Very Good	274
25	4.2	Green	Very Good	221
26	4.3	Green	Very Good	174
27	4.4	Green	Very Good	144
28	4.5	Dark Green	Excellent	95
29	4.6	Dark Green	Excellent	78
30	4.7	Dark Green	Excellent	42
31	4.8	Dark Green	Excellent	25
32	4.9	Dark Green	Excellent	61

Observation

1. When Rating is between 4.5 to 4.9 ---> Excellent
2. When Rating is between 4.0 to 4.4 ---> Very Good
3. When Rating is between 3.5 to 3.9 ---> Good
4. When Rating is between 3.0 to 3.4 ---> Average
5. When Rating is between 2.5 to 2.9 ---> Average
6. When Rating is between 2.0 to 2.4 ---> Poor

In [55]:
```
## Showing Top 5 Rows of a dataset.
ratings.head()
```

Out[55]:

	Aggregate rating	Rating color	Rating text	Rating count
0	0.0	White	Not rated	2148
1	1.8	Red	Poor	1
2	1.9	Red	Poor	2
3	2.0	Red	Poor	7
4	2.1	Red	Poor	15

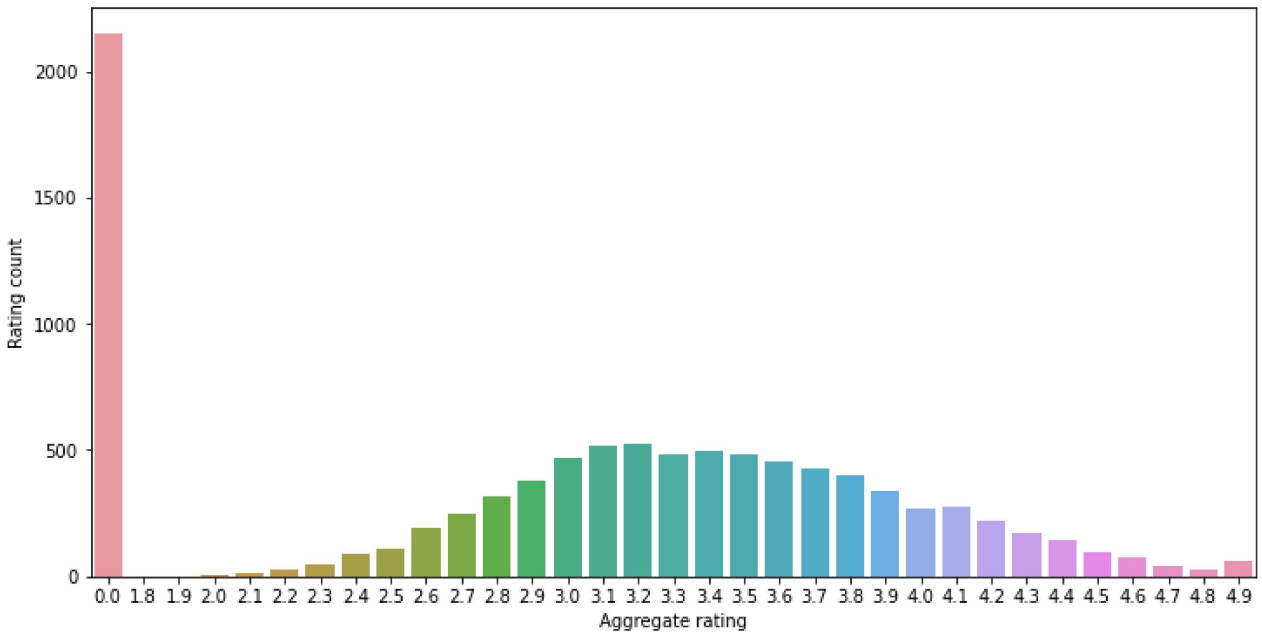
In [71]:

```
## Plotting Bar Plot Chart for x = 'Aggregate rating', y = 'Rating count' Values.

import matplotlib
matplotlib.rcParams['figure.figsize'] = (12,6)
#sns.barplot(x = 'Aggregate rating', y = 'Rating count', data= ratings)
sns.barplot(x = 'Aggregate rating', y = 'Rating count',data= ratings)
```

Out[71]:

```
<AxesSubplot:xlabel='Aggregate rating', ylabel='Rating count'>
```

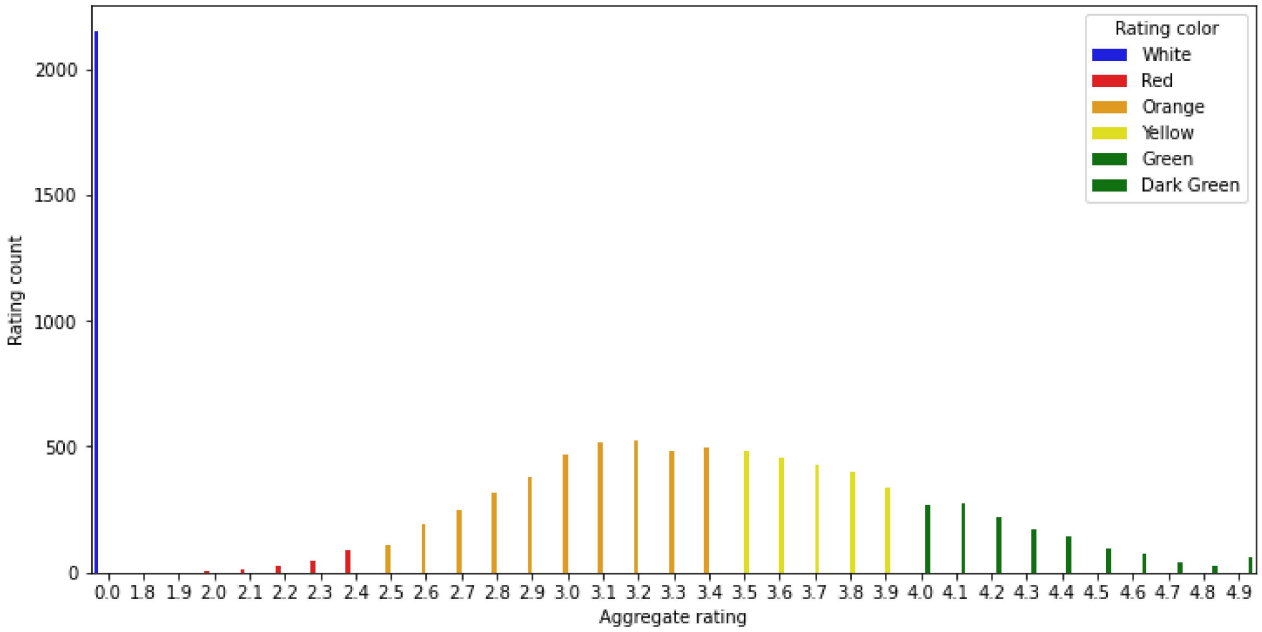


In [70]:

```
## Adjusting Bar Plot layout with the help hue() & palette() properties.
sns.barplot(x = 'Aggregate rating', y = 'Rating count',hue ='Rating color' ,data= ratin
```

Out[70]:

```
<AxesSubplot:xlabel='Aggregate rating', ylabel='Rating count'>
```

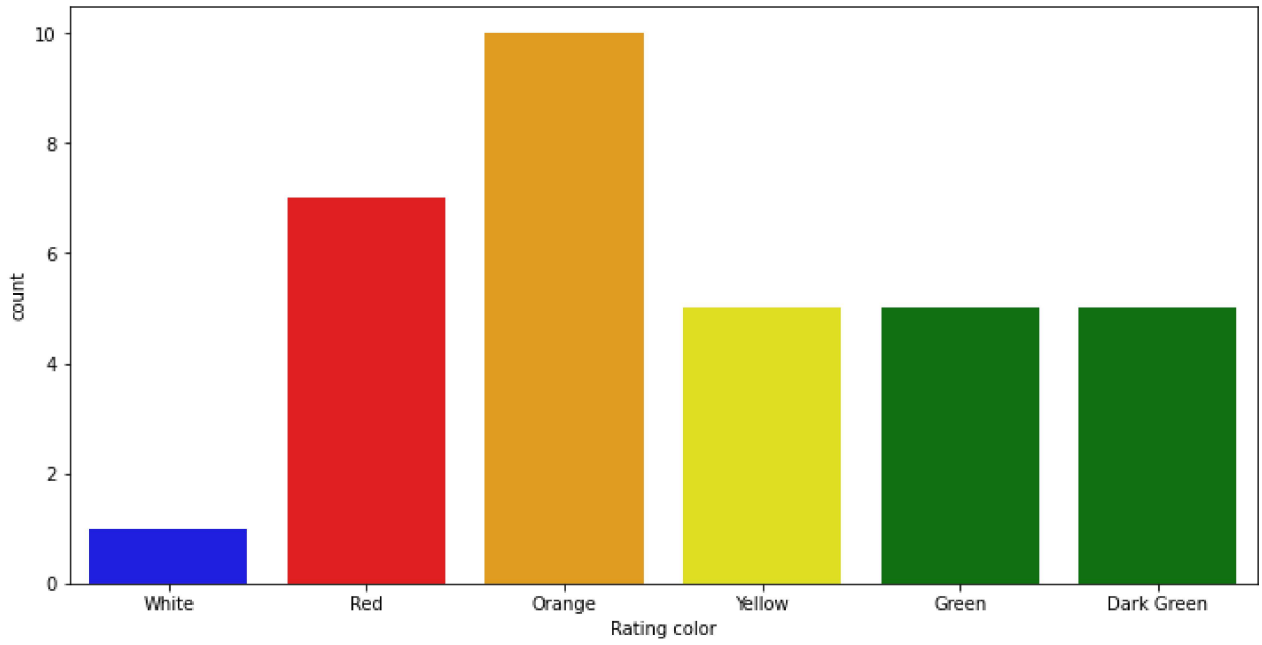


Observation:-

- Not Rated count is very High.
- Maximum Number of rating are between 2.5 to 3.4

In [66]:
```
## Plotting Count Plot Bar
sns.countplot(x='Rating color', data = ratings, palette =['blue', 'red','orange','yello
```

Out[66]:
```
<AxesSubplot:xlabel='Rating color', ylabel='count'>
```



Find the Countries name that has given 0 rating ?

In [73]:
```
## Showing All the columns name Available in the dataset.
final_df.columns
```

Out[73]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes', 'Country'],
      dtype='object')
```

In [80]:
```
## Solution for Above Questions :-
final_df.groupby(['Aggregate rating','Country']).size().reset_index().head(5)
```

Out[80]:

	Aggregate rating	Country	0
0	0.0	Brazil	5
1	0.0	India	2139
2	0.0	United Kingdom	1
3	0.0	United States	3
4	1.8	India	1

Observations:-

- Maximum Number of 0 Ratings are from Indian customers

Find Out which currency is used by which country ?

In [81]:
```
## Showing All the columns name Available in the dataset.
final_df.columns
```

Out[81]:
```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City', 'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude', 'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes', 'Country'],
      dtype='object')
```

In [85]:
```
## Finding Currency for Country by using Groupby()
final_df[['Country','Currency']].groupby(['Country','Currency']).size().reset_index()
```

Out[85]:

	Country	Currency	0
0	Australia	Dollar($)	24
1	Brazil	Brazilian Real(R$)	60
2	Canada	Dollar($)	4
3	India	Indian Rupees(Rs.)	8652
4	Indonesia	Indonesian Rupiah(IDR)	21
5	New Zealand	NewZealand($)	40
6	Phillipines	Botswana Pula(P)	22

	Country	Currency	0
7	Qatar	Qatari Rial(QR)	20
8	Singapore	Dollar($)	20
9	South Africa	Rand(R)	60
10	Sri Lanka	Sri Lankan Rupee(LKR)	20
11	Turkey	Turkish Lira(TL)	34
12	UAE	Emirati Diram(AED)	60
13	United Kingdom	Pounds(£)	80
14	United States	Dollar($)	434

Which Country Do have an online Deliveries option ?

In [86]:
```
## Country which has online delivery Available are listed below:-
final_df[final_df['Has Online delivery'] == "Yes"].Country.value_counts()
```

Out[86]:
```
India    2423
UAE        28
Name: Country, dtype: int64
```

In [87]:
```
## Country which has online delivery Available or Which has Not Availables both list ar
final_df[['Has Online delivery','Country']].groupby(['Has Online delivery','Country']).
```

Out[87]:

	Has Online delivery	Country	0
0	No	Australia	24
1	No	Brazil	60
2	No	Canada	4
3	No	India	6229
4	No	Indonesia	21
5	No	New Zealand	40
6	No	Phillipines	22
7	No	Qatar	20
8	No	Singapore	20
9	No	South Africa	60
10	No	Sri Lanka	20
11	No	Turkey	34
12	No	UAE	32
13	No	United Kingdom	80
14	No	United States	434

	Has Online delivery	Country	0
15	Yes	India	2423
16	Yes	UAE	28

Observation:-

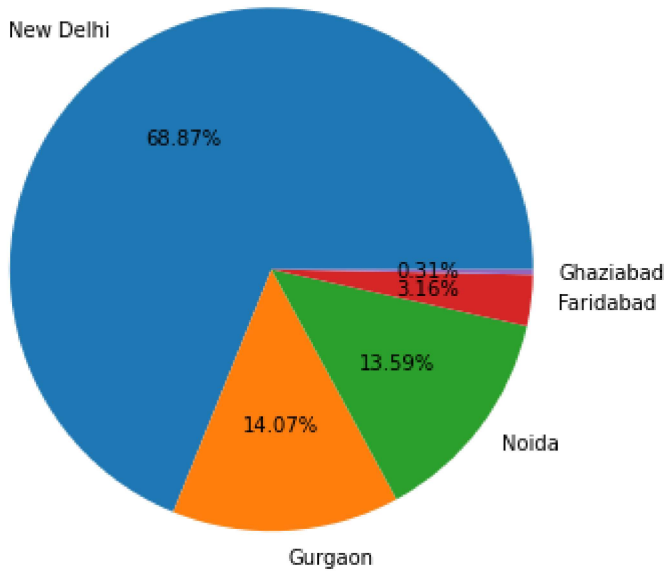
- Online Deliveries are available in India and UAE

Create a Pie chart for Cities Distribution

In [91]:
```
## Finding out all city Value Count and Value label index.
city_values = final_df.City.value_counts().values
city_labels = final_df.City.value_counts().index
```

In [92]:
```
## Plotting the Pie Chart
plt.pie(city_values[:5],labels = city_labels[:5],autopct ='%1.2f%%')
```

Out[92]:
```
([<matplotlib.patches.Wedge at 0x29bf59e50a0>,
  <matplotlib.patches.Wedge at 0x29bf59e5820>,
  <matplotlib.patches.Wedge at 0x29bf59e5f40>,
  <matplotlib.patches.Wedge at 0x29bf59f16a0>,
  <matplotlib.patches.Wedge at 0x29bf59f1dc0>],
 [Text(-0.6145352824185932, 0.9123301960708633, 'New Delhi'),
  Text(0.0623675251198054, -1.0982305276263407, 'Gurgaon'),
  Text(0.8789045225625368, -0.6614581167535246, 'Noida'),
  Text(1.0922218418223437, -0.13058119407559224, 'Faridabad'),
  Text(1.099946280005612, -0.010871113182029924, 'Ghaziabad')],
 [Text(-0.3352010631374145, 0.497634652402289, '68.87%'),
  Text(0.0340186500653484, -0.5990348332507311, '14.07%'),
  Text(0.47940246685229276, -0.36079533641101336, '13.59%'),
  Text(0.5957573682667329, -0.07122610585941394, '3.16%'),
  Text(0.5999706981848791, -0.005929698099289049, '0.31%')])
```



Observations:-

- So, Number of transaction is mainly done by city 'New Delhi'.

Thank You