Zomato Dataset Exploratory Data Analysis

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

In [2]:
```
#"D:\zomato.csv"
df=pd.read_csv("D://zomato.csv",encoding='latin_1')
df.head()
```

Out[2]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines	...	Currency	Has Table booking	Has Online delivery	deli
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century City Mall, Poblacion, Makati City, Mak...	121.027535	14.565443	French, Japanese, Desserts	...	Botswana Pula(P)	Yes	No	
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	14.553708	Japanese	...	Botswana Pula(P)	Yes	No	
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong City	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...	Edsa Shangri-La, Ortigas, Mandaluyong City	Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...	121.056831	14.581404	Seafood, Asian, Filipino, Indian	...	Botswana Pula(P)	Yes	No	
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	14.585318	Japanese, Sushi	...	Botswana Pula(P)	No	No	
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	14.584450	Japanese, Korean	...	Botswana Pula(P)	Yes	No	

5 rows × 21 columns

In [3]:
```
df.columns
```

Out[3]:
```
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 [4]:
```
df.shape
```

Out[4]:
```
(9551, 21)
```

In [5]:
```
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 [6]:
```
df.describe()
```

Out[6]:

	Restaurant ID	Country Code	Longitude	Latitude	Average Cost for two	Price range	Aggregate rating	Votes
count	9.551000e+03	9551.000000	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	156.909748
std	8.791521e+06	56.750546	41.467058	11.007935	16121.183073	0.905609	1.516378	430.169145
min	5.300000e+01	1.000000	-157.948486	-41.330428	0.000000	1.000000	0.000000	0.000000
25%	3.019625e+05	1.000000	77.081343	28.478713	250.000000	1.000000	2.500000	5.000000
50%	6.004089e+06	1.000000	77.191964	28.570469	400.000000	2.000000	3.200000	31.000000
75%	1.835229e+07	1.000000	77.282006	28.642758	700.000000	2.000000	3.700000	131.000000
max	1.850065e+07	216.000000	174.832089	55.976980	800000.000000	4.000000	4.900000	10934.000000

In Data Analysis What All Things We Do

1. Missing Values
2. Explore About the Numerical Variables
3. Explore About categorical variables
4. Finding Relationship between features

In [7]:
```
df.isna().sum()
```

Out[7]:
```
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 [8]:
```
[features for features in df.columns if df[features].isnull().sum()>0]
```

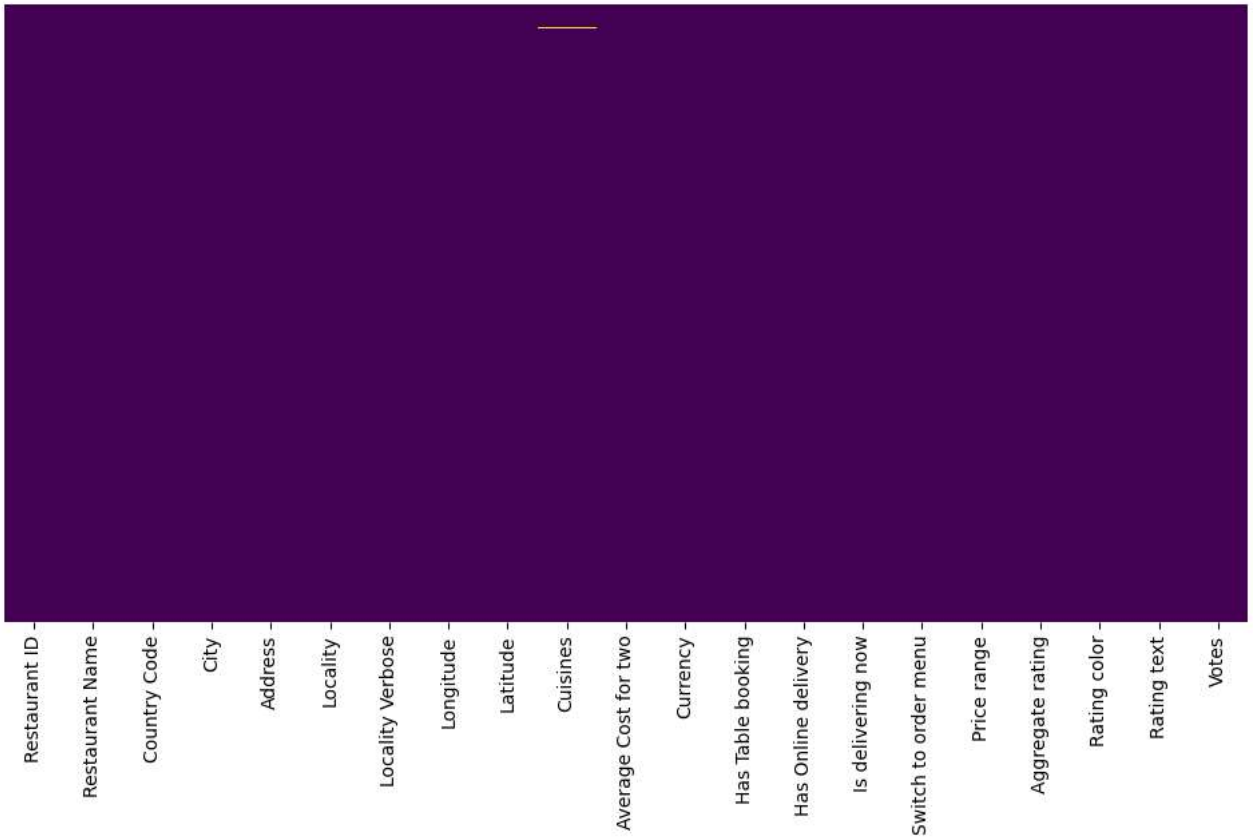
Out[8]:
```
['Cuisines']
```

In [9]:
```
[features for features in df.columns if df[features].isnull().sum()>0]
```

Out[9]:
```
['Cuisines']
```

In [10]:
```
import matplotlib
matplotlib.rcParams['figure.figsize']=(12,6)
sns.heatmap(df.isnull(),yticklabels=False,cbar=False,cmap='viridis')
```

Out[10]:
```
<AxesSubplot:>
```



In [11]:
```
df_country=pd.read_excel("D://Country-Code.xlsx")
```

In [12]:
```
df_country
```

Out[12]:

	Country Code	Country
0	1	India
1	14	Australia
2	30	Brazil
3	37	Canada
4	94	Indonesia
5	148	New Zealand
6	162	Phillipines
7	166	Qatar
8	184	Singapore
9	189	South Africa
10	191	Sri Lanka
11	208	Turkey
12	214	UAE
13	215	United Kingdom
14	216	United States

In [13]:
```
df.columns
```

Out[13]:
```
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 [14]:
```
final_df=pd.merge(df,df_country,on='Country Code',how='left')
```

In [15]:
```
final_df.head(2)
```

Out[15]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines	...	Has Table booking	Has Online delivery	Is delivering now	Switch to order menu	Price range
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century City Mall, Poblacion, Makati City, Mak...	121.027535	14.565443	French, Japanese, Desserts	...	Yes	No	No	No	3
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	14.553708	Japanese	...	Yes	No	No	No	3

2 rows × 22 columns

In [16]:
```
## To check Data Types
final_df.dtypes
```

Out[16]:
```
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
```

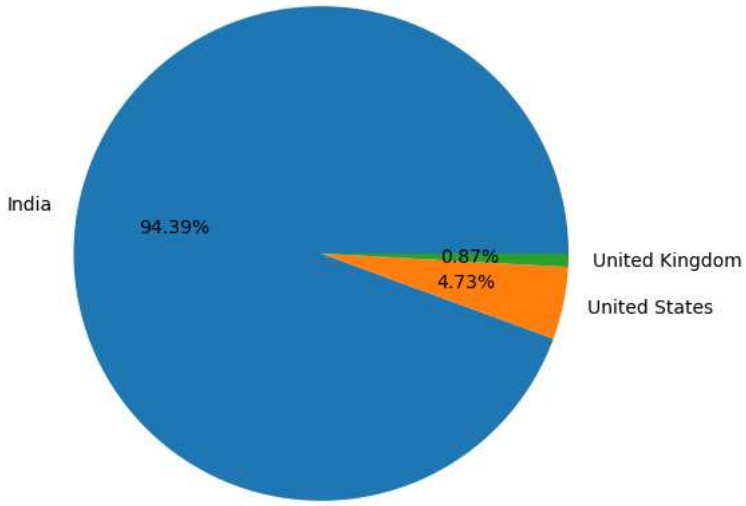
In [17]:
```
final_df.Country.value_counts()
```

Out[17]:
```
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
```

In [18]:
```
country_names=final_df.Country.value_counts().index
```

In [19]:
```
country_val=final_df.Country.value_counts().values
```

In [39]:
```
## Pie Chart-- Top 3 countries that uses zomato
plt.pie(country_val[:3],labels=country_names[:3],autopct='%1.2f%%')
plt.show()
```



Observation:Most of the orders from the india after that USA and then UK.

In [21]:
```
final_df.columns
```

Out[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', 'Is delivering now', 'Switch to order menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating text',
       'Votes', 'Country'],
      dtype='object')
```

In [22]:
```
ratings=final_df.groupby(['Aggregate rating','Rating color','Rating text']).size().reset_index().rename(columns={0:'Rating Count'
```

In [23]:
```
ratings
```

Out[23]:

	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
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 the rating in between 4.5 to 4.9-----> Excellent
2. when the rating in between 4.0 to 4.4-----> Very Good
3. when the rating in between 3.5 to 3.9-----> Good
4. when the rating in between 2.5 to 3.4-----> Average
5. when the rating in between 1.8 to 2.4-----> Poor

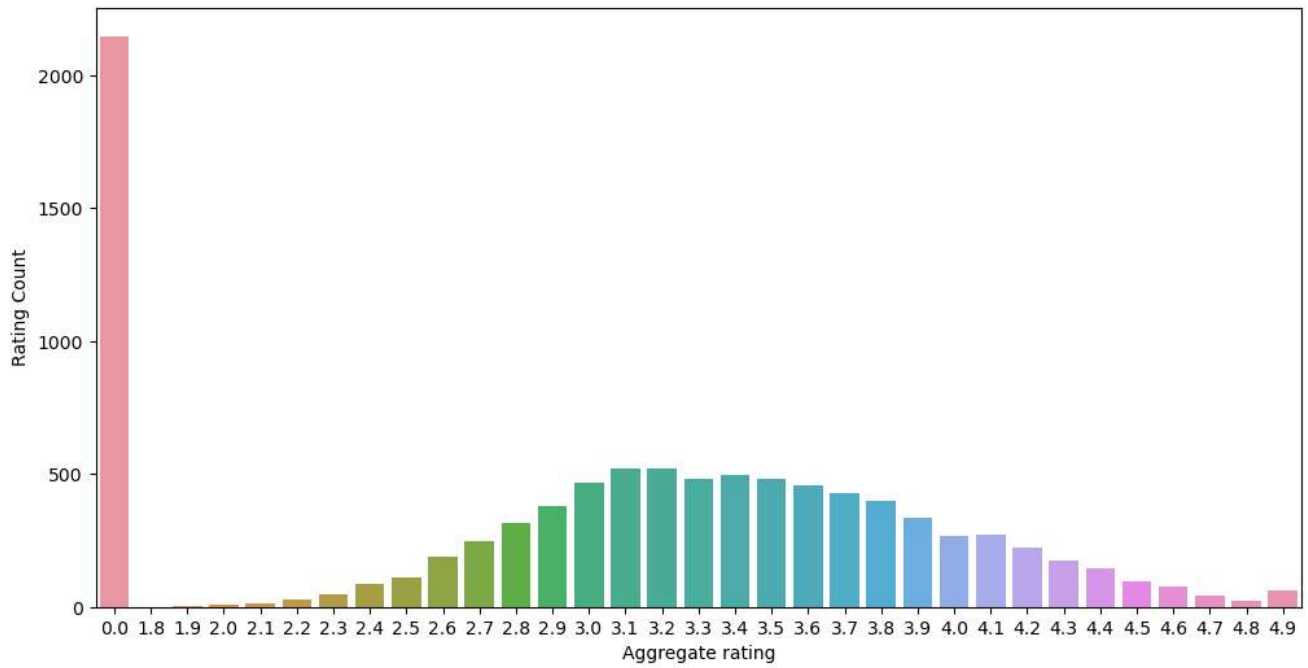
In [24]:
```
ratings.head()
```

Out[24]:

	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

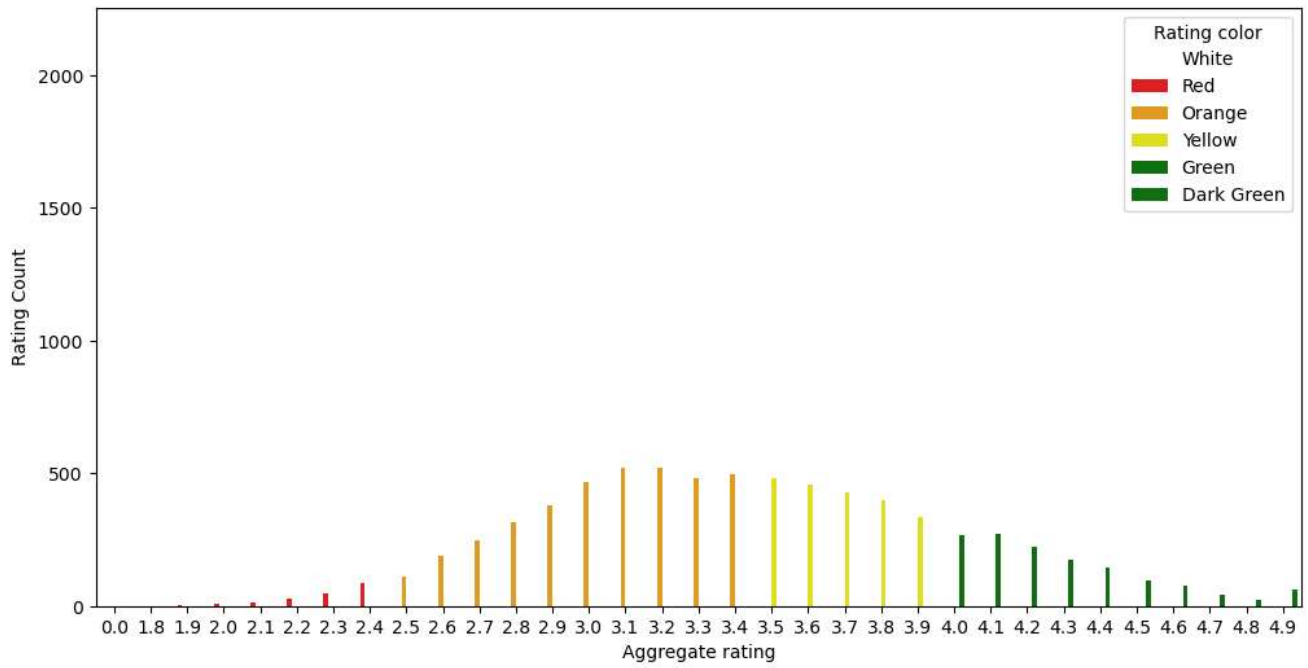
In [25]:
```
plt.figure(figsize=(12,6))
sns.barplot(x='Aggregate rating',y='Rating Count',data=ratings)
```

Out[25]: <AxesSubplot:xlabel='Aggregate rating', ylabel='Rating Count'>



In [26]:
```
sns.barplot(x='Aggregate rating',y='Rating Count',hue='Rating color',data=ratings,palette=['white','Red','Orange','Yellow','Green
```

Out[26]: <AxesSubplot:xlabel='Aggregate rating', ylabel='Rating Count'>

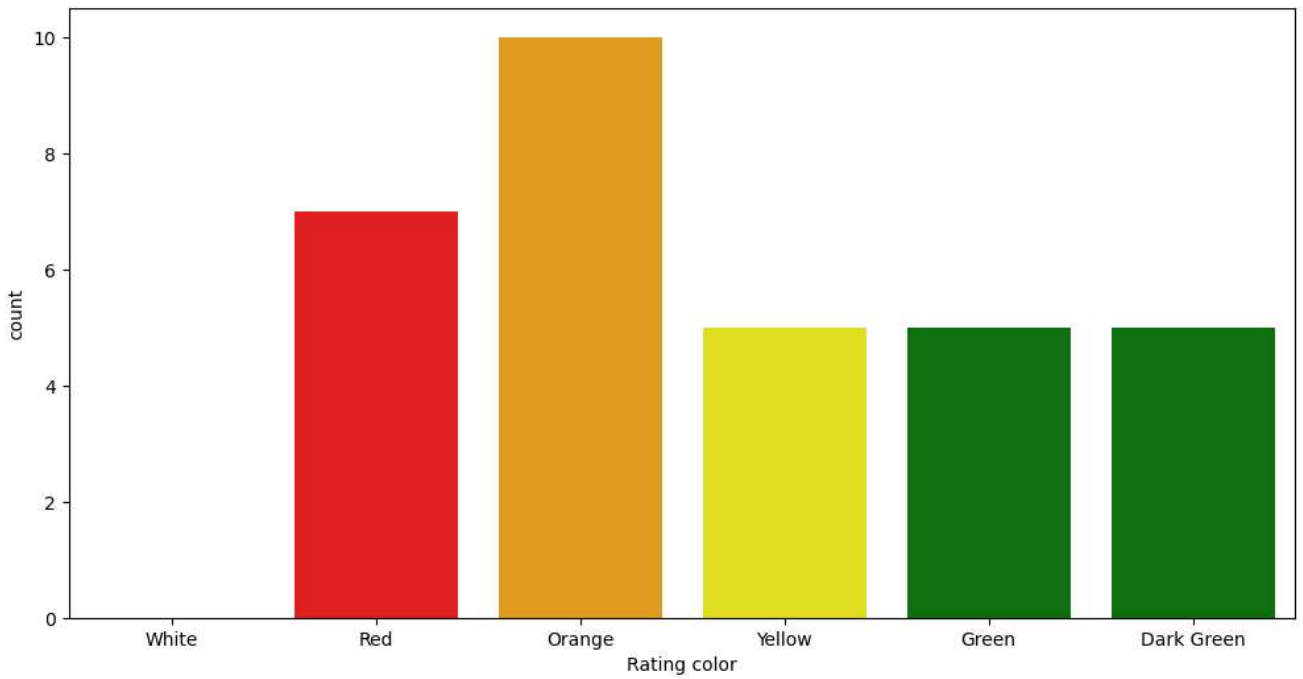


Observation:

1. Not Rated count is very high
2. Maximum number of rating are between 2.5 to 3.4

In [27]:
```
## Count plot
sns.countplot(x='Rating color',data=ratings,palette=['White','Red','Orange','Yellow','Green','Green'])
```

Out[27]:
```
<AxesSubplot:xlabel='Rating color', ylabel='count'>
```



In [28]:
```
### Find the countries name that has given 0 rating
final_df[final_df['Rating color']=='White'].groupby('Country').size().reset_index()
```

Out[28]:

	Country	0
0	Brazil	5
1	India	2139
2	United Kingdom	1
3	United States	3

Observations : Maximum number of ratings are from the indian customers

In [29]:
```
final_df['Currency'].value_counts()
```

Out[29]:
```
Indian Rupees(Rs.)        8652
Dollar($)                  482
Pounds( £)                  80
Brazilian Real(R$)          60
Emirati Diram(AED)          60
Rand(R)                     60
NewZealand($)               40
Turkish Lira(TL)            34
Botswana Pula(P)            22
Indonesian Rupiah(IDR)      21
Qatari Rial(QR)             20
Sri Lankan Rupee(LKR)       20
Name: Currency, dtype: int64
```

In [30]:
```
##find out which currency is used by which country?
final_df[['Country','Currency']].groupby(['Country','Currency']).size().reset_index()
```

Out[30]:

	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
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

In [31]:
```
## Which countrys do have online deliveries option
final_df[['Country','Has Online delivery']].groupby(['Country','Has Online delivery']).size().reset_index()
```

Out[31]:

	Country	Has Online delivery	0
0	Australia	No	24
1	Brazil	No	60
2	Canada	No	4
3	India	No	6229
4	India	Yes	2423
5	Indonesia	No	21
6	New Zealand	No	40
7	Phillipines	No	22
8	Qatar	No	20
9	Singapore	No	20
10	South Africa	No	60
11	Sri Lanka	No	20
12	Turkey	No	34
13	UAE	No	32
14	UAE	Yes	28
15	United Kingdom	No	80
16	United States	No	434

Observations:

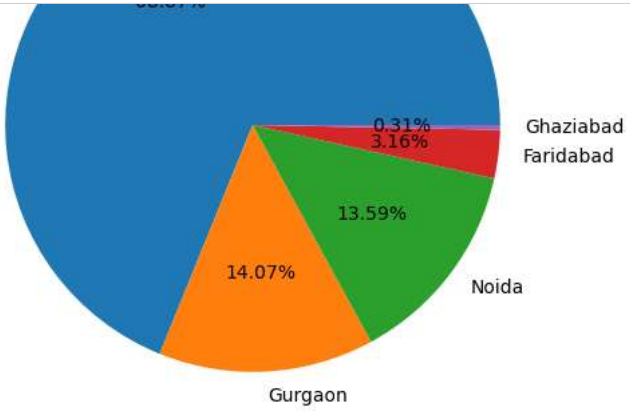
1. Online Deliveries are available in India and UAE

In [32]:
```
final_df['City'].value_counts().index
```

Out[32]:
```
Index(['New Delhi', 'Gurgaon', 'Noida', 'Faridabad', 'Ghaziabad',
       'Bhubaneshwar', 'Amritsar', 'Ahmedabad', 'Lucknow', 'Guwahati',
       ...
       'Ojo Caliente', 'Montville', 'Monroe', 'Miller', 'Middleton Beach',
       'Panchkula', 'Mc Millan', 'Mayfield', 'Macedon', 'Vineland Station'],
      dtype='object', length=141)
```

In [33]:
```
city_values=final_df.City.value_counts().values
city_labels=final_df.City.value_counts().index
```

In [38]:
```
plt.pie(city_values[:5],labels=city_labels[:5],autopct='%1.2f%%')
plt.show()
```



Assignment

Find out top 10 cuisines

In [35]:
```
final_df['Cuisines'].value_counts().head(10)
```

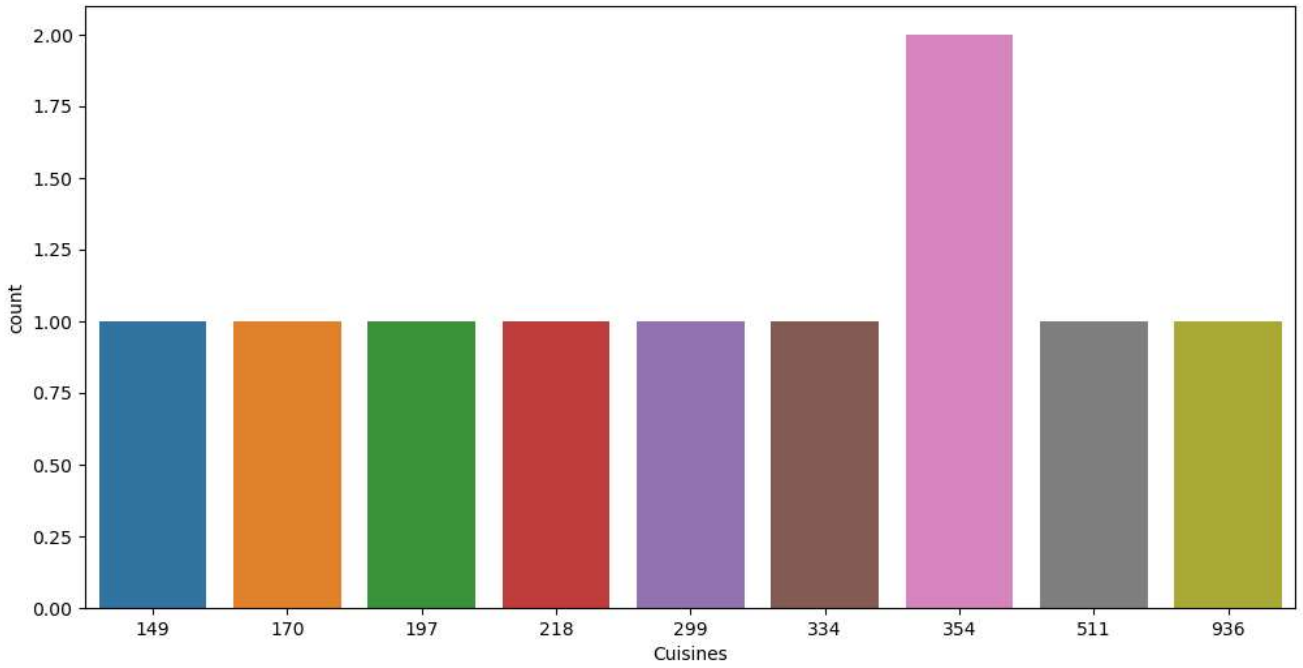
Out[35]:
```
North Indian                      936
North Indian, Chinese             511
Chinese                           354
Fast Food                         354
North Indian, Mughlai             334
Cafe                              299
Bakery                            218
North Indian, Mughlai, Chinese    197
Bakery, Desserts                  170
Street Food                       149
Name: Cuisines, dtype: int64
```

In [36]:
```
final_df.Cuisines.value_counts()[:5]
```

Out[36]:
```
North Indian             936
North Indian, Chinese    511
Chinese                  354
Fast Food                354
North Indian, Mughlai    334
Name: Cuisines, dtype: int64
```

In [37]:
```
sns.countplot(df['Cuisines'].value_counts()[:10])
```

Out[37]: <AxesSubplot:xlabel='Cuisines', ylabel='count'>



In [ ]:
```

```