In [5]:
```
# Importing libraries

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

In [6]:
```
df=pd.read_csv("zomato.csv",encoding='latin-1')
df.head()
```

Out[6]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitu
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...	121.0275
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...	121.0141
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...	121.0568
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...	121.0564
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...	121.0575

5 rows × 21 columns

In [7]:
```
df.columns
```

Out[7]:
```
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 [8]:
```
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 [9]:
```
df.describe()
```

Out[9]:

	Restaurant ID	Country Code	Longitude	Latitude	Average Cost for two	Price range	Aggreg rati
count	9.551000e+03	9551.000000	9551.000000	9551.000000	9551.000000	9551.000000	9551.000(
mean	9.051128e+06	18.365616	64.126574	25.854381	1199.210763	1.804837	2.666:
std	8.791521e+06	56.750546	41.467058	11.007935	16121.183073	0.905609	1.516:
min	5.300000e+01	1.000000	-157.948486	-41.330428	0.000000	1.000000	0.000(
25%	3.019625e+05	1.000000	77.081343	28.478713	250.000000	1.000000	2.500(
50%	6.004089e+06	1.000000	77.191964	28.570469	400.000000	2.000000	3.200(
75%	1.835229e+07	1.000000	77.282006	28.642758	700.000000	2.000000	3.700(
max	1.850065e+07	216.000000	174.832089	55.976980	800000.000000	4.000000	4.900(

In data anyaysis all Things we do

1.missing values 2.explore about the numerical variable 3.explore about categorical variable 4.finding relationshilp between features

In [10]:
```
df.isnull().sum()
```

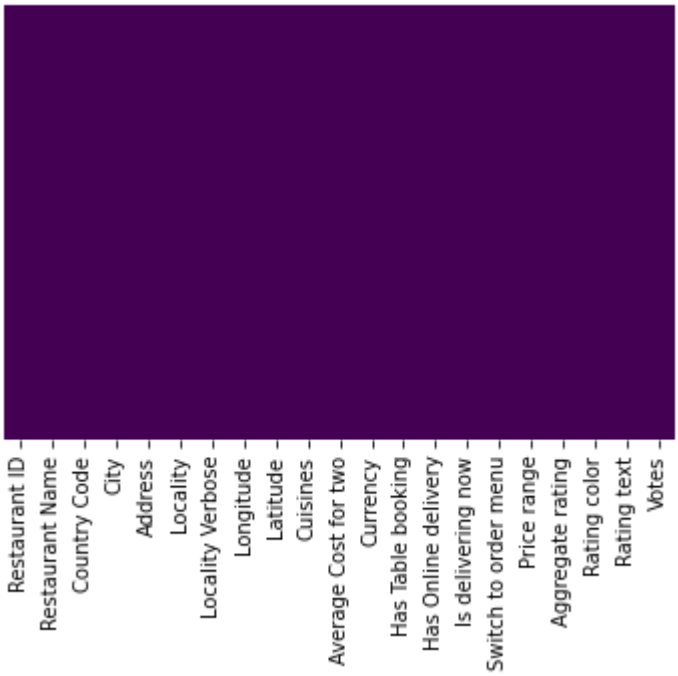
Out[10]:
```
Restaurant ID           0
Restaurant Name         0
Country Code            0
City                    0
Address                 0
Locality                0
Locality Verbose        0
Longitude               0
Latitude                0
Cuisines                9
Average Cost for two    0
Currency                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 [11]:
```
[features for features in df.columns if df[features].isnull().sum()>0]
```

Out[11]:
```
['Cuisines']
```

In [12]:
```
sns.heatmap(df.isnull(),yticklabels=False,cbar=False,cmap='viridis')
```

Out[12]:
```
<AxesSubplot: >
```



In [13]:
```
df_country=pd.read_excel('Country-Code.xlsx')
df_country.head()
```

Out[13]:

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

In [14]:
```
df.columns
```

Out[14]:
```
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 [ ]:
```
```

In [15]:
```
final_df=pd.merge(df,df_country,on='Country Code',how='left')
```

In [16]:
```
final_df.head(2)
```

Out[16]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century City Mall, Poblacion, Makati City, Mak...	121.027535	14.565443
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyo, Legaspi Village, Makati City, Ma...	121.014101	14.553708

2 rows × 22 columns

In [17]:
```
## To check data types
final_df.dtypes
```

Out[17]:
```
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 [18]:
```
_
```

Out[18]:
```
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 [19]:
```
final_df.columns
```

Out[19]:
```
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 [20]:
```
country_names=final_df.Country.value_counts().index
```

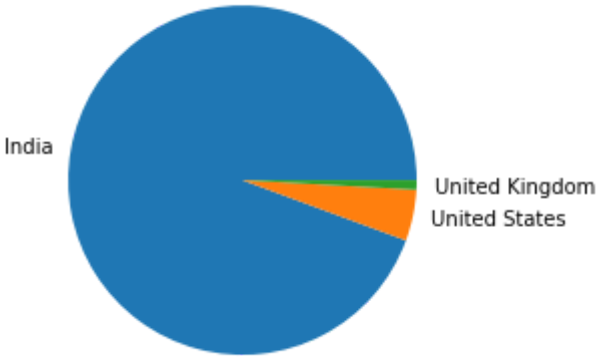
In [21]:
```
country_val=final_df.Country.value_counts().values
```

In [ ]:
```

```

In [22]:
```
## pie chart_ Top 3 counrties that uses Zomato
plt.pie(country_val[:3],labels=country_names[:3])
```

Out[22]:
```
([<matplotlib.patches.Wedge at 0x7f30f902b7f0>,
  <matplotlib.patches.Wedge at 0x7f30f902bc70>,
  <matplotlib.patches.Wedge at 0x7f30f8e64130>],
 [Text(-1.0829742700952103, 0.19278674827836725, 'India'),
  Text(1.077281715838356, -0.22240527134123297, 'United States'),
  Text(1.0995865153823035, -0.03015783794312073, 'United Kingdom')])
```



In [23]:
```
## Numrical Variable
```

In [24]:
```
final_df.columns
```

Out[24]:
```
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 [25]:
```
ratings=final_df.groupby(['Aggregate rating','Rating color','Rating text']).size().
```

In [26]:
```
ratings
```

Out[26]:

	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 Rating is between 4.5 to 4.9 -->Excellent 2.when Rating is between 4.0 to 3.4 -->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 3.0 to 3.4 -->average 6.when rating is between 2.5.0 to 2.9-->average 5.when rating is between 2.0 to 2.4 -->poor

In [27]:
```
ratings.head()
```

Out[27]:

	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

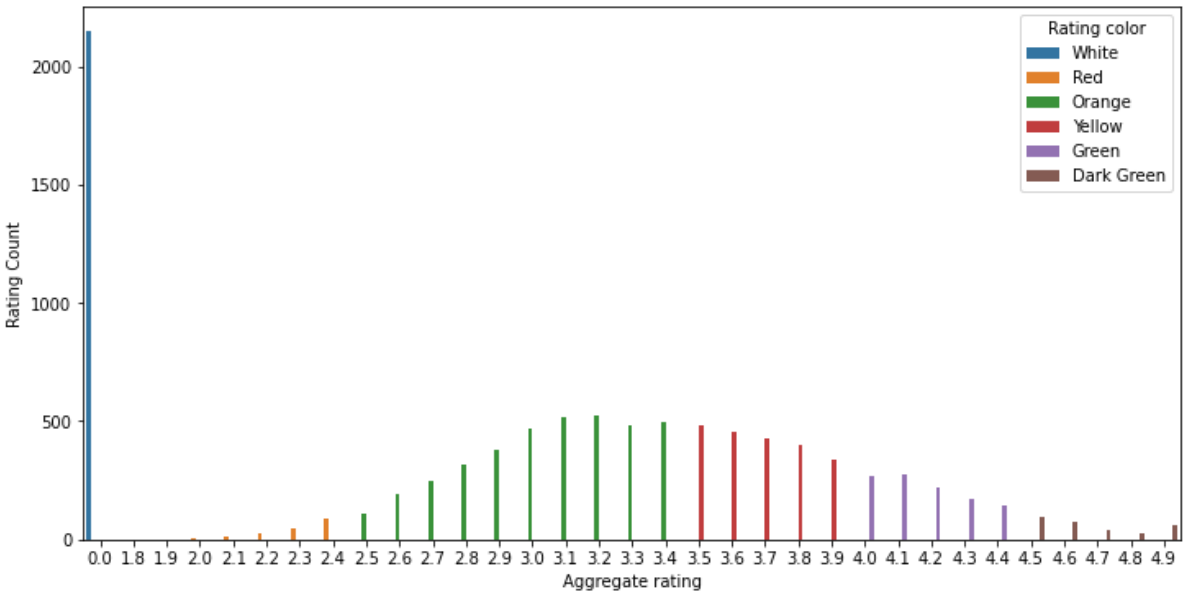
In [28]:
```
ratings.head()
```

Out[28]:

	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 [29]:
```
import matplotlib
matplotlib.rcParams['figure.figsize']=(12, 6)
sns.barplot(x="Aggregate rating",y="Rating Count",hue='Rating color',data=ratings)
```

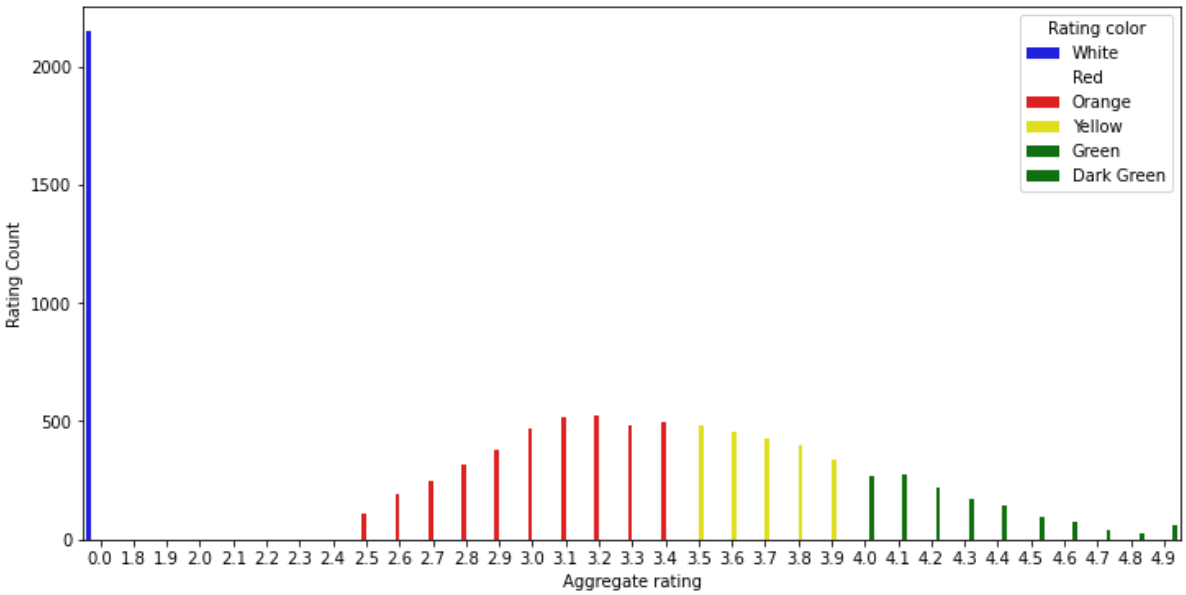
Out[29]:
```
<AxesSubplot: xlabel='Aggregate rating', ylabel='Rating Count'>
```



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

In [33]:
```
#  bar plot
sns.barplot(x="Aggregate rating",y="Rating Count" ,hue='Rating color',data=ratings,
```

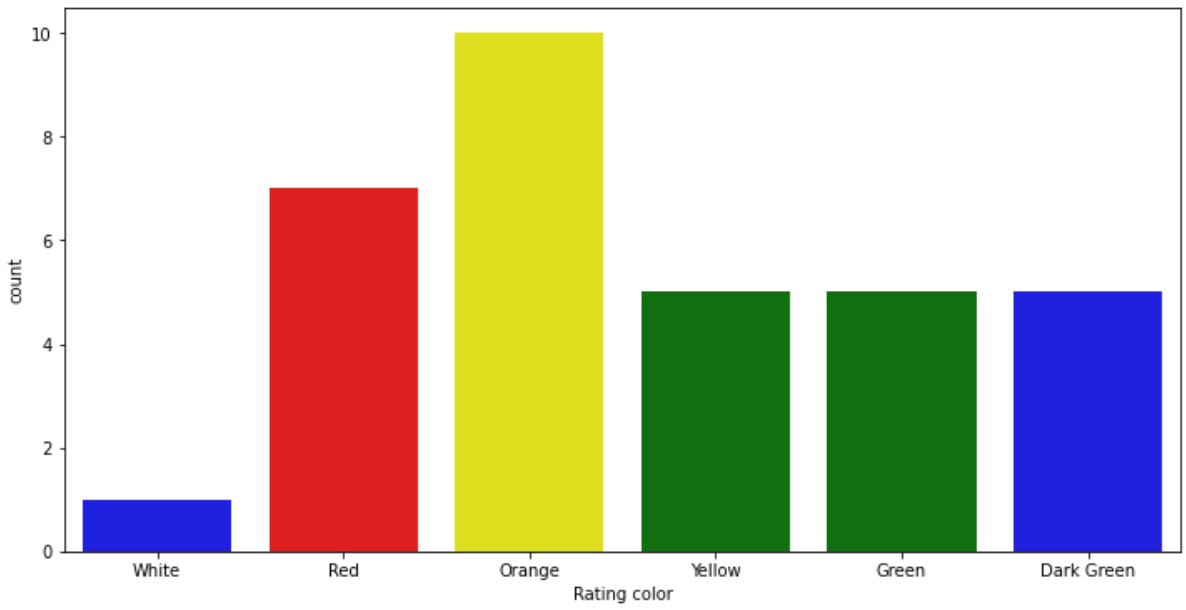
Out[33]:
```
<AxesSubplot: xlabel='Aggregate rating', ylabel='Rating Count'>
```



Obervation : 1.Not rated count is very high 2.maximum numbers ofv rating are between 2.5 to 3.4

In [38]:
```
## count plot
sns.countplot(x="Rating color",data=ratings,palette= ['blue','red','yellow','green'
```

Out[38]:
```
<AxesSubplot: xlabel='Rating color', ylabel='count'>
```



In [39]:
```
ratings
```

Out[39]:

	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

In [44]:
```
## find the countries name that has given o rating
final_df[final_df['Rating color']=='White'].groupby('Country').size().reset_index()
```

Out[44]:

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

In [52]:
```
final_df.groupby(['Aggregate rating','Country']).size().reset_index().head(5)
```

Out[52]:

	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

Obervation 1.Maximum number of 0 ratings are from Indian customer

In [53]:
```
final_df.columns
```

Out[53]:
```
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 [56]:
```
final_df[['Country','Currency']].groupby(['Country','Currency']).size().reset_index
```

Out[56]:

	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 [61]:
```
## Which countries do ahve online deliveries option
final_df.groupby(['Has Online delivery']).size().reset_index()
```

Out[61]:

	Has Online delivery	0
0	No	7100
1	Yes	2451

In [67]:
```
final_df[final_df['Has Online delivery'] == "Yes"].Country.value_counts()
```

Out[67]:
```
India    2423
UAE        28
Name: Country, dtype: int64
```

In [74]:
```
final_df[['Has Online delivery','Country']].groupby(['Has Online delivery','Country
```

Out[74]:

	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
15	Yes	India	2423
16	Yes	UAE	28

In [ ]:

Obervations: 1.Online delivaries are avaliible in india and UAE

In [75]:
```
final_df.columns
```

Out[75]:
```
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 [ ]:
```
## Create a pie Chart a specific top 5 cities distibution
```

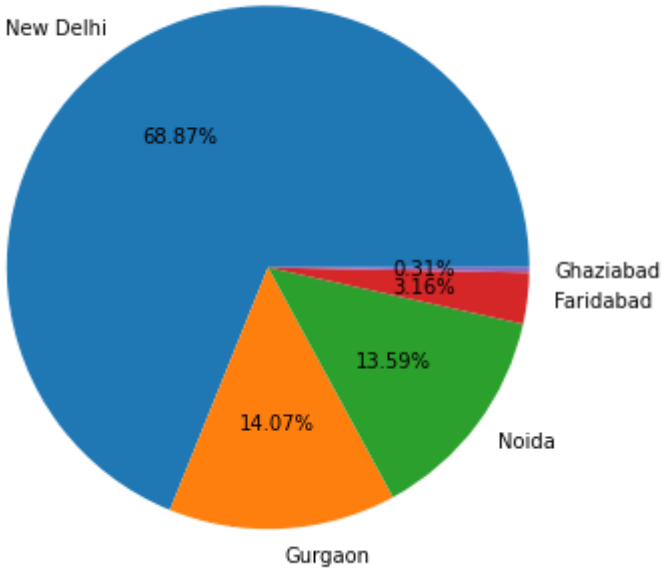
In [77]:
```
final_df.City.value_counts().index
```

Out[77]:
```
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 [84]:
```
city_values=final_df.City.value_counts().values
city_labels=final_df.City.value_counts().index
```

In [87]:
```
plt.pie(city_values[:5],labels=city_labels[:5],autopct='%1.2f%%')
```

Out[87]:
```
([<matplotlib.patches.Wedge at 0x7f30f43f9390>,
  <matplotlib.patches.Wedge at 0x7f30f43f9a20>,
  <matplotlib.patches.Wedge at 0x7f30f43fa0b0>,
  <matplotlib.patches.Wedge at 0x7f30f43fa740>,
  <matplotlib.patches.Wedge at 0x7f30f43fadd0>],
 [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%')])
```



In [ ]: