EDA on Zoamto Dataset 🔥 🔥

In [3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [5]:
```
df=pd.read_csv('zomato.csv',encoding='latin-1')
df.head()
```

Out[5]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitu
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	14.5654
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	14.5537
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	14.5814
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	14.5853
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	14.5844

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 [11]:
```
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]:
```
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	95
mean	9.051128e+06	18.365616	64.126574	25.854381	1199.210763	1.804837	2.666370	1
std	8.791521e+06	56.750546	41.467058	11.007935	16121.183073	0.905609	1.516378	4
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	1
max	1.850065e+07	216.000000	174.832089	55.976980	800000.000000	4.000000	4.900000	109

Data Analysis Steps

1]. Find the missing Values 2]. Explore About the numerical variable 3]. Explore about Categorical variable 4]. Find relationships among features

In [14]:
```
df.isnull().sum()
```

Out[14]:
```
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 [17]:
```
[features for features in df.columns if df[features].isnull().sum()>0]

# this Quesry is used to find which columns have missing  value
#or we can say that its used to check for nul values
```

Out[17]:
```
['Cuisines']
```

In [57]:
```
#Heat MAp
sns.heatmap(df.isnull(),yticklabels=False,cbar=False,cmap='viridis')
```

Out[57]:
```
<AxesSubplot:>
```

In [19]:
```
df_country=pd.read_excel('Country-Code.xlsx')
df_country.head()
```

Out[19]:

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

In [20]:
```
df.columns
```

Out[20]:
```
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 [22]:
```
final_df=pd.merge(df,df_country,on='Country Code',how='left')
```

In [24]:
```
final_df.head(2)
```

Out[24]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisin
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	Frenc Japanes Desse
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	Japane

2 rows × 22 columns

In [25]:
```
# Check data types
final_df.dtypes
```

Out[25]:
```
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 [26]:
```
final_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', 'Country'],
      dtype='object')
```

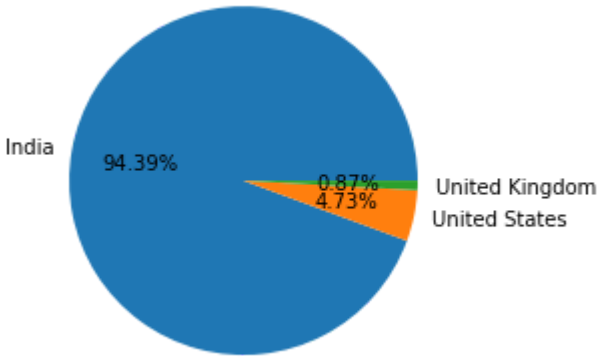
In [31]:
```
country_names=final_df.Country.value_counts().index
# to find Number of Countries
```

Out[31]:
```
Index(['India', 'United States', 'United Kingdom', 'Brazil', 'UAE',
       'South Africa', 'New Zealand', 'Turkey', 'Australia', 'Phillipines',
       'Indonesia', 'Singapore', 'Qatar', 'Sri Lanka', 'Canada'],
      dtype='object')
```

In [36]:
```
country_value=final_df.Country.value_counts().values
# to get np. for piechart
```

In [40]:
```
plt.pie(country_value[:3],labels=country_names[:3],autopct='%1.2f%%')
#for top 3 countries
```

Out[40]:
```
([<matplotlib.patches.Wedge at 0x22a1e704430>,
  <matplotlib.patches.Wedge at 0x22a1e704b50>,
  <matplotlib.patches.Wedge at 0x22a1e7102b0>],
 [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 ka sales zabse zayda India mai hota hai

In [42]:
```
final_df.columns
```

Out[42]:
```
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 [49]:
```
ratings=final_df.groupby(['Aggregate rating','Rating color','Rating text']).size().reset
```

In [50]:
```
ratings
```

Out[50]:

	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) Rating between 4.5 -4.9 is excelent 2) rating between 4.0 -4.5 is Good 3. rating between 3.4-3.9 is good 4) rating between 2.5-3.4 is average 5) Rating between 1.8 to 2.4 is poor

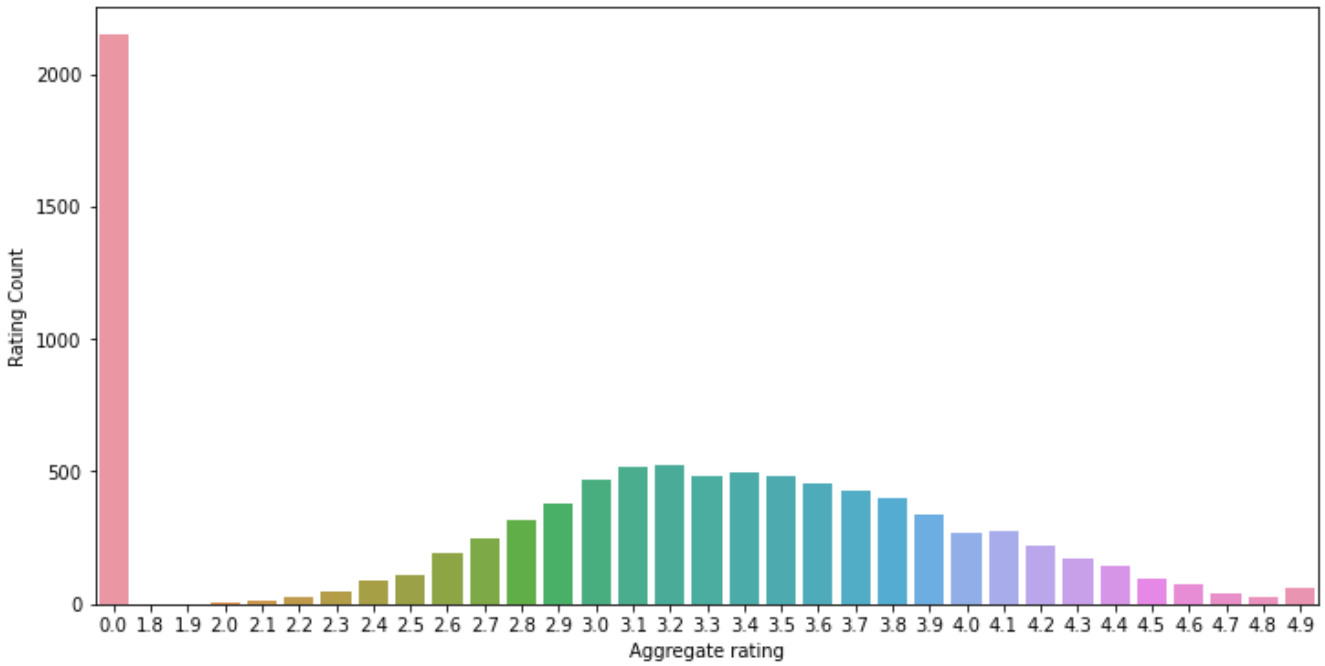
In [53]:
```
ratings.head()
```

Out[53]:

	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 [56]:
```
import matplotlib
matplotlib.rcParams['figure.figsize'] = (12, 6)
sns.barplot(x='Aggregate rating',y='Rating Count',data=ratings)
```

Out[56]:
```
<AxesSubplot:xlabel='Aggregate rating', ylabel='Rating Count'>
```



In [64]:
```
sns.barplot(x='Aggregate rating',y='Rating Count',hue='Rating color',data=ratings,palett
```

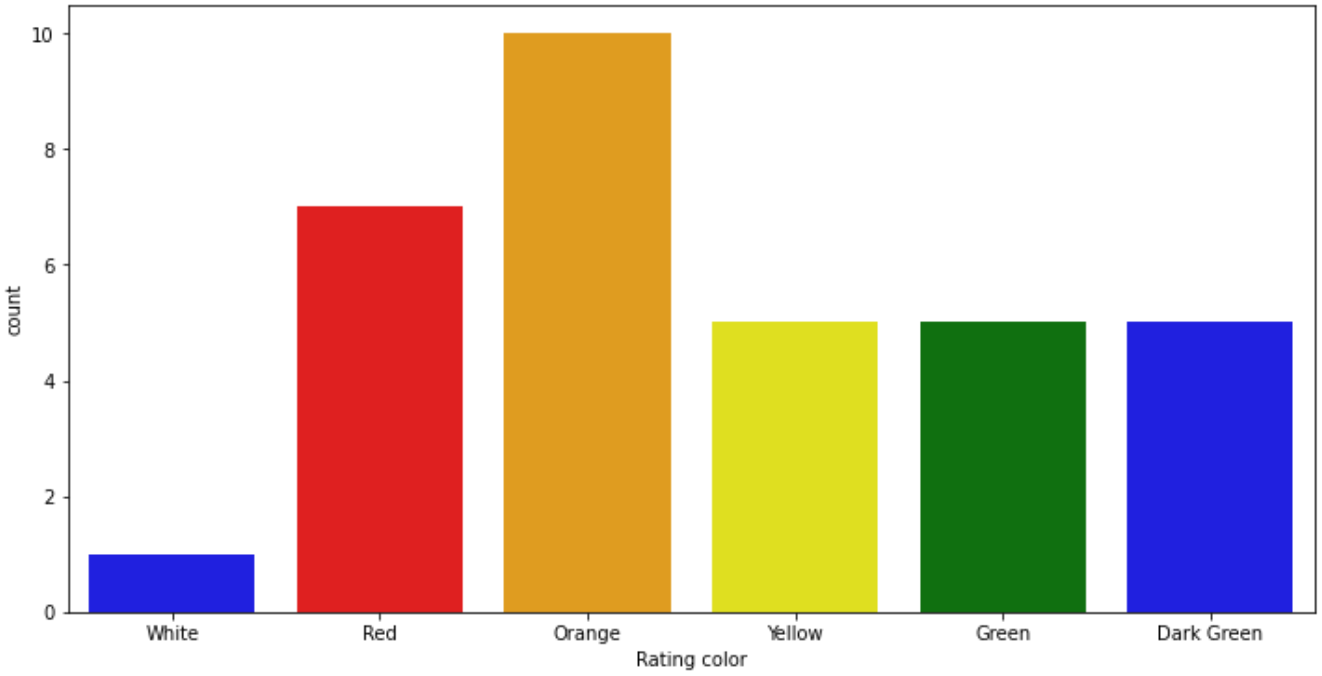
Out[64]:
```
<AxesSubplot:xlabel='Aggregate rating', ylabel='Rating Count'>
```

observations:

1. 2000+ people not rated
2. mostly rated between 2.5 to 3.4

In [68]:
```
sns.countplot(x='Rating color',data=ratings,palette=['blue','red','orange','yellow','gre
```

Out[68]:
```
<AxesSubplot:xlabel='Rating color', ylabel='count'>
```



In [69]:
```
final_df.columns
```

Out[69]:
```
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 [74]:
```
final_df.groupby(['Aggregate rating','Country']).size().reset_index()
```

Out[74]:

	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
...	...	...	...
217	4.9	Sri Lanka	1
218	4.9	Turkey	3
219	4.9	UAE	4
220	4.9	United Kingdom	4
221	4.9	United States	14

222 rows × 3 columns

observation Indian coustomers give 0 ratings

In [78]:
```
final_df.columns
```

Out[78]:
```
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 [79]:
```
final_df[['Country','Currency']].groupby(['Country','Currency']).size().reset_index()
```

Out[79]:

	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 [80]:
```
final_df[['Country','Has Online delivery']].groupby(['Country','Has Online delivery']).s
```

Out[80]:

	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

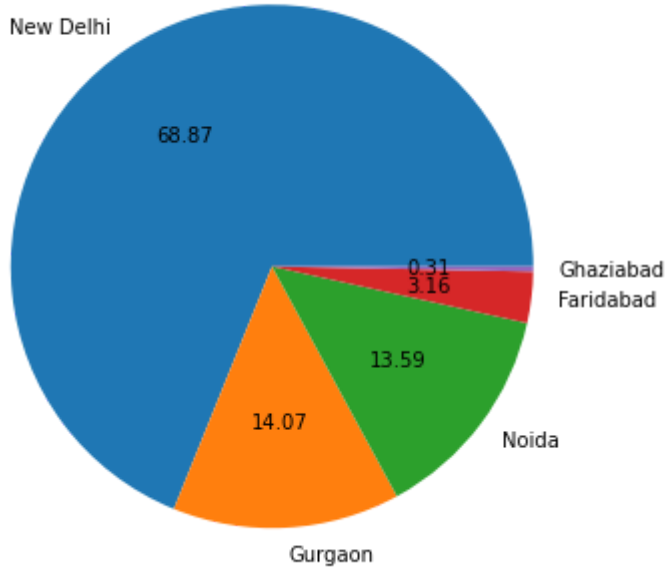
In [81]:
```
final_df.City.value_counts().index
```

Out[81]:
```
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 [88]:
```
city_values=final_df.City.value_counts().values
city_labels=final_df.City.value_counts().index
```

In [90]:
```
plt.pie(city_values[:5],labels=city_labels[:5],autopct='%1.2f')
```

Out[90]:
```
([<matplotlib.patches.Wedge at 0x22a226cf4c0>,
  <matplotlib.patches.Wedge at 0x22a226cfb50>,
  <matplotlib.patches.Wedge at 0x22a226de250>,
  <matplotlib.patches.Wedge at 0x22a226de970>,
  <matplotlib.patches.Wedge at 0x22a226ec0d0>],
 [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 [91]:
```
final_df.columns
```

Out[91]:
```
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 [94]:
```
final_df[['City','Cuisines']].groupby(['City','Cuisines']).size().reset_index()
```

Out[94]:

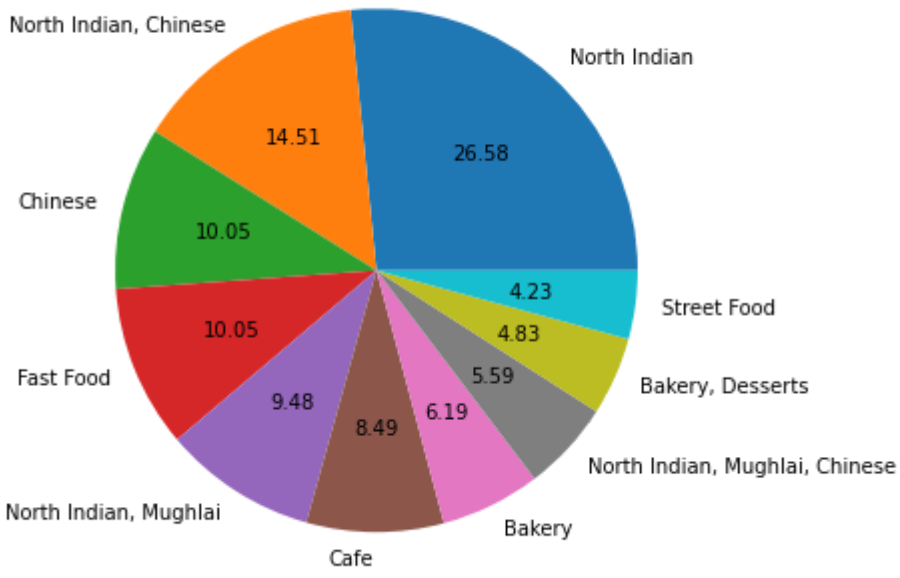
	City	Cuisines	0
0	Abu Dhabi	American	2
1	Abu Dhabi	American, Desserts	1
2	Abu Dhabi	American, Mexican, Seafood	1
3	Abu Dhabi	Asian	1
4	Abu Dhabi	Chinese	1
...	...	...	...
3019	ÛÁstanbul	Restaurant Cafe	2
3020	ÛÁstanbul	Restaurant Cafe, Desserts	1
3021	ÛÁstanbul	Restaurant Cafe, Turkish, Desserts	1
3022	ÛÁstanbul	Turkish	1
3023	ÛÁstanbul	World Cuisine, Patisserie, Cafe	1

3024 rows × 3 columns

In [95]:
```
Cuisines_values=final_df.Cuisines.value_counts().values
Cuisines_labels=final_df.Cuisines.value_counts().index
```

In [96]:
```
plt.pie(Cuisines_values[:10],labels=Cuisines_labels[:10],autopct='%1.2f')
```

Out[96]:
```
([<matplotlib.patches.Wedge at 0x22a22735610>,
  <matplotlib.patches.Wedge at 0x22a22735d30>,
  <matplotlib.patches.Wedge at 0x22a22741490>,
  <matplotlib.patches.Wedge at 0x22a22741be0>,
  <matplotlib.patches.Wedge at 0x22a2274d340>,
  <matplotlib.patches.Wedge at 0x22a2274da60>,
  <matplotlib.patches.Wedge at 0x22a2275c1c0>,
  <matplotlib.patches.Wedge at 0x22a2275c8e0>,
  <matplotlib.patches.Wedge at 0x22a2275cfd0>,
  <matplotlib.patches.Wedge at 0x22a2276a760>],
 [Text(0.7383739846958008, 0.8153550507137645, 'North Indian'),
  Text(-0.5794679314239953, 0.9349956772366362, 'North Indian, Chinese'),
  Text(-1.067309479615702, 0.26617752482593154, 'Chinese'),
  Text(-1.0185984499802057, -0.4152796620326146, 'Fast Food'),
  Text(-0.5935788454809928, -0.9261015895664211, 'North Indian, Mughlai'),
  Text(-0.005887079599915552, -1.0999842463843672, 'Cafe'),
  Text(0.4842062514572988, -0.9876964645323336, 'Bakery'),
  Text(0.808736477166136, -0.7456174022251013, 'North Indian, Mughlai, Chinese'),
  Text(1.0055375294202338, -0.44597564611473206, 'Bakery, Desserts'),
  Text(1.090298995560443, -0.14576728123927227, 'Street Food')],
 [Text(0.4027494461977095, 0.4447391185711442, '26.58'),
  Text(-0.316073417140361, 0.5099976421290743, '14.51'),
  Text(-0.5821688070631101, 0.14518774081414446, '10.05'),
  Text(-0.5555991545346576, -0.22651617929051704, '10.05'),
  Text(-0.32377027935326874, -0.5051463215816842, '9.48'),
  Text(-0.003211134327226664, -0.5999914071187457, '8.49'),
  Text(0.26411250079489024, -0.5387435261085456, '6.19'),
  Text(0.441128987545165, -0.40670040121369155, '5.59'),
  Text(0.5484750160474001, -0.24325944333530836, '4.83'),
  Text(0.5947085430329688, -0.07950942613051214, '4.23')])
```



In [ ]: