In [53]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [54]:
```
df=pd.read_csv('C:\\Users\\SAI\\Downloads\\Brave\\Zomatodataset\\zomato.csv',encoding='latin-1')
df.head()
```

Out[54]:

	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 [55]:
```
df.columns
```

Out[55]:
```
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 [56]:
```
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 [57]:
```
df.describe()
```

Out[57]:

	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 [58]:
```
df.shape
```

Out[58]:
```
(9551, 21)
```

In [59]:
```
df.isnull().sum()
```

Out[59]:
```
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
```

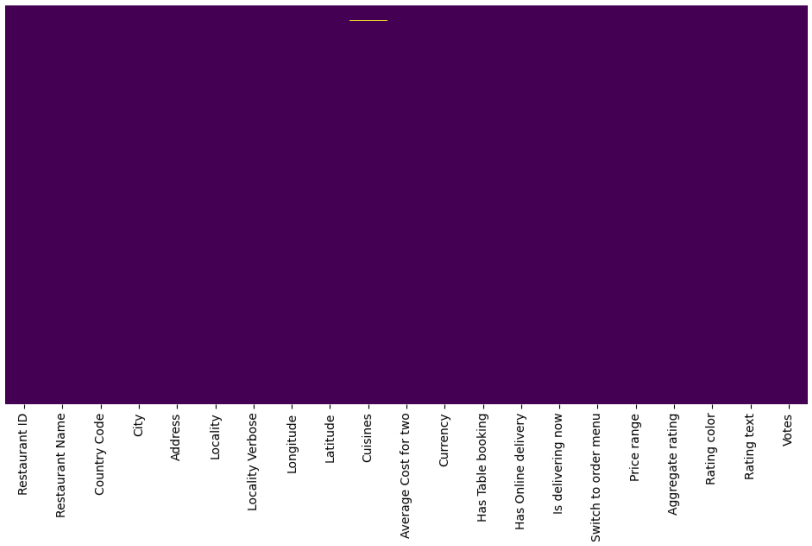
another the way check Duplicated

In [60]:
```
[features for features in df.columns if df[features].isnull().sum()>0]
```

Out[60]:
```
['Cuisines']
```

In [61]:
```
sns.heatmap(df.isnull(),yticklabels=False,cbar=False,cmap='viridis')
```

Out[61]:
```
<Axes: >
```



In [62]:
```
df_country=pd.read_excel('C://Users//SAI//Downloads//Brave//Zomatodataset//Country-Code.xlsx')
df_country.head()
```

Out[62]:

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

In [63]:
```
df.columns
```

Out[63]:
```
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 [64]:
```
final_df=pd.merge(df,df_country,on='Country Code', how='left')
```

In [65]:
```
final_df.head()
```

Out[65]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitude	Cuisines	...	Has Table booking	Has Online delivery	Is delivering now
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
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
					Edsa Shangri-	Edsa	Edsa			Seafood,				

In [66]:
```
final_df.dtypes
```

Out[66]:
```
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 [67]:
```
final_df.columns
```

Out[67]:
```
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 [68]:
```
final_df.Country.value_counts().index
```

Out[68]:
```
Index(['India', 'United States', 'United Kingdom', 'Brazil', 'UAE',
       'South Africa', 'New Zealand', 'Turkey', 'Australia', 'Phillipines',
       'Indonesia', 'Singapore', 'Qatar', 'Sri Lanka', 'Canada'],
      dtype='object')
```

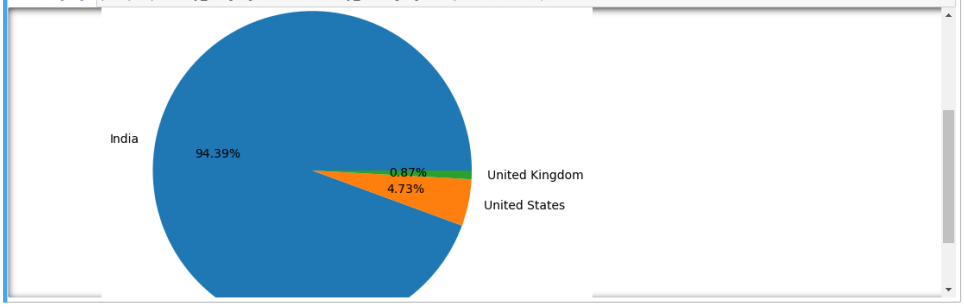
In [69]:
```
final_df.Country.value_counts().values
```

Out[69]:
```
array([8652,  434,   80,   60,   60,   60,   40,   34,   24,   22,   21,
         20,   20,   20,    4], dtype=int64)
```

In [108]:
```
country_names=final_df.Country.value_counts().index
```

In [71]:
```
country_val=final_df.Country.value_counts().values
```

In [72]:
```
plt.pie(country_val[:3],labels=country_names[:3],autopct='%1.2f%%')
```



In [73]:
```
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 [93]:
```
ratings=final_df.groupby(['Aggregate rating','Rating color','Rating text']).size().reset_index().rename(columns={0:'Rating Count'
```

In [75]:
```
ratings
```

Out[75]:

	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 [ ]:
```
Observation:
When Rating is between 4.5 to 4.9---> Excellent
When Rating are between 4.0 to 3.4--->very good
when Rating is between 3.5 to 3.9----> good
when Rating is between 3.0 to 3.4----> average
when Rating is between 2.5 to 2.9----> average
when Rating is between 2.0 to 2.4----> Poor
```

In [76]:
```
ratings.head()
```

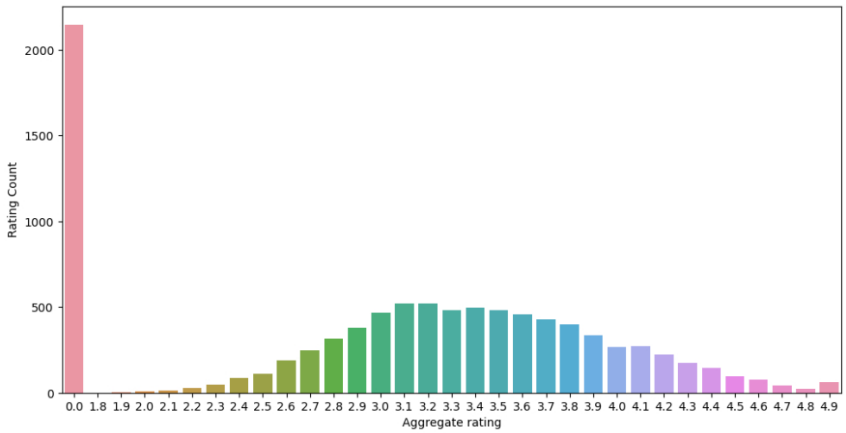
Out[76]:

	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

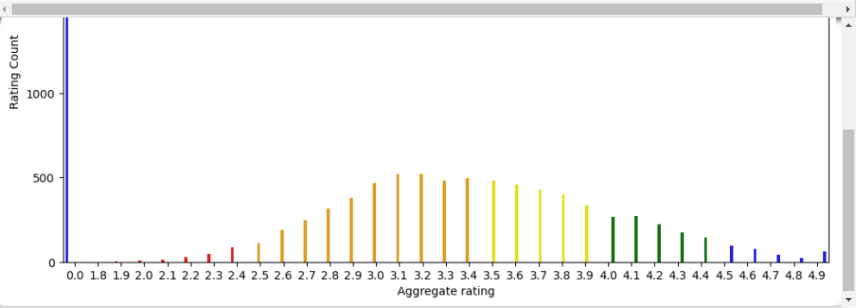
Observation

In [77]:
```
import matplotlib
matplotlib.rcParams['figure.figsize'] = (12, 6)
sns.barplot(x="Aggregate rating",y="Rating Count",data=ratings)
```

Out[77]: <Axes: xlabel='Aggregate rating', ylabel='Rating Count'>



In [78]:
```
sns.barplot(x="Aggregate rating",y="Rating Count",hue='Rating color',data=ratings,palette=['blue','red','orange','yellow','green'
```

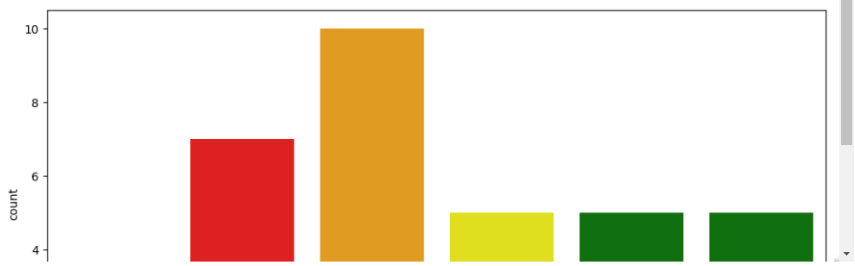


In [ ]:
```
Observation:

Not Rated count is very high
Maximum number of rating are between 2.5 to 3.4
```

In [90]:
```
## Count plot
sns.countplot(x="Rating color",data=ratings,palette=['blue','red','orange','yellow','green','green'])
```

Out[90]: <Axes: xlabel='Rating color', ylabel='count'>



In [ ]:
```
ratings
```

In [92]:
```
final_df[final_df['Rating color']=='White'].groupby('Country').size().reset_index()
```

Out[92]:

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

In [91]:
```
final_df.groupby(['Aggregate rating','Country']).size().reset_index().head(5)
```

Out[91]:

	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

In [115]:
```
final_df.columns
```

Out[115]:
```
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 [ ]:
```
final_df[['Country','Currency']].groupby(['Country','Currency']).size().reset_index()
```

In [80]:
```
final_df[final_df['Has Online delivery'] =="Yes"].Country.value_counts()
```

Out[80]:
```
India    2423
UAE        28
Name: Country, dtype: int64
```

In [81]:
```python
final_df[['Has Online delivery','Country']].groupby(['Has Online delivery','Country']).size().reset_index()
```

Out[81]:

	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

```
Observations:

Online Deliveries are available in India and UAE
```

In [116]:
```python
final_df.columns
```

Out[116]:
```
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 [117]:
```python
final_df.City.value_counts().values
```

Out[117]:
```
array([5473, 1118, 1080,  251,   25,   21,   21,   21,   21,   21,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         20,   20,   20,   20,   20,   20,   20,   20,   20,   20,   20,
         18,   18,   16,   14,   11,    6,    4,    4,    3,    3,    2,
          2,    2,    2,    2,    2,    2,    2,    1,    1,    1,    1,
          1,    1,    1,    1,    1,    1,    1,    1,    1,    1,    1,
          1,    1,    1,    1,    1,    1,    1,    1,    1,    1,    1,
          1,    1,    1,    1,    1,    1,    1,    1,    1,    1,    1,
          1,    1,    1,    1,    1,    1,    1,    1,    1], dtype=int64)
```

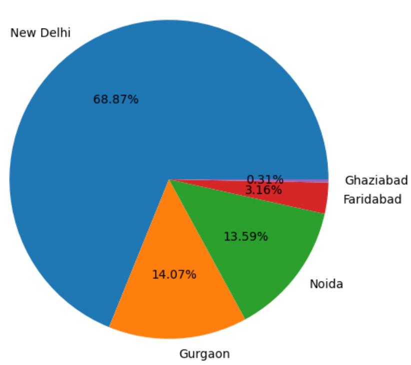
In [118]:
```python
final_df.City.value_counts().index
```

Out[118]:
```
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 [85]:
```python
city_values=final_df.City.value_counts().values
city_labels=final_df.City.value_counts().index
```

In [86]:
```python
plt.pie(city_values[:5],labels=city_labels[:5],autopct='%1.2f%%')
```

Out[86]:
```
([<matplotlib.patches.Wedge at 0x27b0e1d0d10>,
  <matplotlib.patches.Wedge at 0x27b0e1d1f50>,
  <matplotlib.patches.Wedge at 0x27b0e1d35d0>,
  <matplotlib.patches.Wedge at 0x27b0e1d8d50>,
  <matplotlib.patches.Wedge at 0x27b0e1da3d0>],
 [Text(-0.6145352824185932, 0.912330196070863, '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(0.595757368266 7329, -0.07122610585941394, '3.16%'),
  Text(0.5999706981848791, -0.005929698099289049, '0.31%')])
```



In [87]:
```python
final_df.columns
```

Out[87]:
```
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 [105]:
```python
cuisines=final_df.groupby(['Restaurant Name',,'Cuisines']).size().reset_index()
```

In [106]:
```python
cuisines
```

Out[106]:

	Restaurant Name	City	Cuisines	0
0	Let's Burrrp	Noida	Chinese, North Indian	1
1	#45	Mangalore	Cafe	1
2	#Dilliwaala6	Puducherry	North Indian	1
3	#InstaFreeze	New Delhi	Ice Cream	1
4	#OFF Campus	New Delhi	Cafe, Continental, Italian, Fast Food	1
...	...	...	...	...
8277	t Lounge by Dilmah	New Delhi	Cafe, Tea, Desserts	1
8278	tashas	Cape Town	Cafe, Mediterranean	1
8279	wagamama	Wellington City	Japanese, Asian	1
8280	{Niche} - Cafe & Bar	New Delhi	North Indian, Chinese, Italian, Continental	1
8281	íÜukuraÛóa SofrasÛ±	Ankara	Kebab, Izgara	1

8282 rows × 4 columns

In [119]:
```
final_df.Cuisines.value_counts().index
```

Out[119]:
```
Index(['North Indian', 'North Indian, Chinese', 'Chinese', 'Fast Food',
       'North Indian, Mughlai', 'Cafe', 'Bakery',
       'North Indian, Mughlai, Chinese', 'Bakery, Desserts', 'Street Food',
       ...
       'Cafe, Pizza, Burger',
       'Healthy Food, Continental, Juices, Beverages, Italian, Salad, Lebanese',
       'Goan, American, Portuguese', 'South Indian, Desserts, Beverages',
       'Healthy Food, North Indian, Italian, Salad', 'Bengali, Fast Food',
       'North Indian, Rajasthani, Asian',
       'Chinese, Thai, Malaysian, Indonesian',
       'Bakery, Desserts, North Indian, Bengali, South Indian',
       'Italian, World Cuisine'],
      dtype='object', length=1825)
```

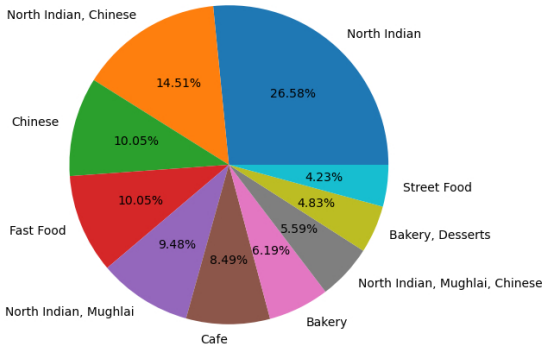
In [121]:
```
final_df.Cuisines.value_counts().values
```

Out[121]:
```
array([936, 511, 354, ...,   1,   1,   1], dtype=int64)
```

In [123]:
```
Cuisines_values=final_df.Cuisines.value_counts().values
Cuisines_labels=final_df.Cuisines.value_counts().index
```

In [124]:
```
plt.pie(Cuisines_values[:10],labels=Cuisines_labels[:10],autopct='%1.2f%%')
```

Out[124]:
```
([<matplotlib.patches.Wedge at 0x27b0e2fc990>,
  <matplotlib.patches.Wedge at 0x27b0e2ffed0>,
  <matplotlib.patches.Wedge at 0x27b0e7584d0>,
  <matplotlib.patches.Wedge at 0x27b0e758fd0>,
  <matplotlib.patches.Wedge at 0x27b0e74ad50>,
  <matplotlib.patches.Wedge at 0x27b0e115910>,
  <matplotlib.patches.Wedge at 0x27b0e2d4c10>,
  <matplotlib.patches.Wedge at 0x27b0e765050>,
  <matplotlib.patches.Wedge at 0x27b0e74a490>,
  <matplotlib.patches.Wedge at 0x27b0e74c710>],
 [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(-0.323770279353268 74, -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 [ ]: