EXPLORATORY DATA ANALYSIS PROJECT

In [1]:
```python
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

Reading our dataset

In [2]:
```python
df=pd.read_csv(r"C:\Users\Ajit\Desktop\Data Sciene\Data Set for Projects\zor
```

```
In [3]: df
```

Out[3]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbos
0	6317637	Le Petit Souffle	162	Makati City	Third Floor, Century City Mall, Kalayaan Avenu...	Century City Mall, Poblacion, Makati City	Century Cit Mal Poblacion Makati City Mak.
1	6304287	Izakaya Kikufuji	162	Makati City	Little Tokyo, 2277 Chino Roces Avenue, Legaspi...	Little Tokyo, Legaspi Village, Makati City	Little Tokyc Legasp Village Makati City Ma.
2	6300002	Heat - Edsa Shangri-La	162	Mandaluyong City	Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...	Edsa Shangri-La, Ortigas, Mandaluyong City	Edsa Shangr La, Ortigas Mandaluyon City, Ma.
3	6318506	Ooma	162	Mandaluyong City	Third Floor, Mega Fashion Hall, SM Megamall, O...	SM Megamall, Ortigas, Mandaluyong City	SM Megamal Ortigas Mandaluyon City, Mandal.
4	6314302	Sambo Kojin	162	Mandaluyong City	Third Floor, Mega Atrium, SM Megamall, Ortigas...	SM Megamall, Ortigas, Mandaluyong City	SM Megamal Ortigas Mandaluyon City, Mandal.
...	...	...	...	...	...	...	.
9546	5915730	NamlÛ± Gurme	208	ÛÁstanbul	Kemanke□ô Karamustafa Pa□ôa Mahallesi, RÛ±htÛ±...	Karakí_y	Karakí_y ÛÁstanbu
9547	5908749	Ceviz AÛôacÛ±	208	ÛÁstanbul	Ko□ôuyolu Mahallesi, Muhittin îìstí_ndaÛô Cadd...	Ko□ôuyolu	Ko□ôuyolu ÛÁstanbu
9548	5915807	Huqqa	208	ÛÁstanbul	Kuruí_e□ôme Mahallesi, Muallim Naci Caddesi, N...	Kuruí_e□ôme	Kuruí_e□ôme ÛÁstanbu
9549	5916112	A□ô□ôk Kahve	208	ÛÁstanbul	Kuruí_e□ôme Mahallesi, Muallim Naci Caddesi, N...	Kuruí_e□ôme	Kuruí_e□ôme ÛÁstanbu
9550	5927402	Walter's Coffee Roastery	208	ÛÁstanbul	CafeaÛôa Mahallesi, BademaltÛ± Sokak, No 21/B,...	Moda	Moda ÛÁstanbu

9551 rows × 21 columns

In [4]: `df.head()`

Out[4]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Lon
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...	121.0
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...	121.0
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...	121.0
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...	121.0
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...	121.0

5 rows × 21 columns

In [5]: `df.tail()`

Out[5]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose
9546	5915730	NamlÛ± Gurme	208	ÛÁstanbul	Kemanke□ô Karamustafa Pa□ôa Mahallesi, RÛ±htÛ±...	Karakí_y	Karakí_y, ÛÁstanbul
9547	5908749	Ceviz AÛôacÛ±	208	ÛÁstanbul	Ko□ôuyolu Mahallesi, Muhittin îìstí_ndaÛô Cadd...	Ko□ôuyolu	Ko□ôuyolu, ÛÁstanbul
9548	5915807	Huqqa	208	ÛÁstanbul	Kuruí_e□ôme Mahallesi, Muallim Naci Caddesi, N...	Kuruí_e□ôme	Kuruí_e□ôme, ÛÁstanbul
9549	5916112	A□ô□ôk Kahve	208	ÛÁstanbul	Kuruí_e□ôme Mahallesi, Muallim Naci Caddesi, N...	Kuruí_e□ôme	Kuruí_e□ôme, ÛÁstanbul
9550	5927402	Walter's Coffee Roastery	208	ÛÁstanbul	CafeaÛôa Mahallesi, BademaltÛ± Sokak, No 21/B,...	Moda	Moda, ÛÁstanbul

5 rows × 21 columns

In [6]: `df.shape`

Out[6]: (9551, 21)

In [7]: `df.size`

Out[7]: 200571

In [8]: `df.columns`

Out[8]: 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 [9]: df.describe
```

```
Out[9]:  <bound method NDFrame.describe of         Restaurant ID         Restaurant
Name  Country Code               City  \
0              6317637        Le Petit Souffle       162        Makati C
ity
1              6304287        Izakaya Kikufuji       162        Makati C
ity
2              6300002    Heat - Edsa Shangri-La     162   Mandaluyong C
ity
3              6318506                    Ooma       162   Mandaluyong C
ity
4              6314302             Sambo Kojin       162   Mandaluyong C
ity
...                ...                     ...       ...
...
9546           5915730           NamlÛ± Gurme       208          ÛÁstan
bul
9547           5908749           Ceviz AÛôacÛ±       208          ÛÁstan
bul
9548           5915807                   Huqqa       208          ÛÁstan
bul
9549           5916112            A?ô?ôk Kahve       208          ÛÁstan
bul
9550           5927402  Walter's Coffee Roastery     208          ÛÁstan
bul

                                              Address  \
0        Third Floor, Century City Mall, Kalayaan Avenu...
1        Little Tokyo, 2277 Chino Roces Avenue, Legaspi...
2        Edsa Shangri-La, 1 Garden Way, Ortigas, Mandal...
3        Third Floor, Mega Fashion Hall, SM Megamall, O...
4        Third Floor, Mega Atrium, SM Megamall, Ortigas...
...                                                ...
9546     Kemanke?ô Karamustafa Pa?ôa Mahallesi, RÛ±htÛ±...
9547     Ko?ôuyolu Mahallesi, Muhittin íìstí_ndaÛô Cadd...
9548     Kuruí_e?ôme Mahallesi, Muallim Naci Caddesi, N...
9549     Kuruí_e?ôme Mahallesi, Muallim Naci Caddesi, N...
9550     CafeaÛôa Mahallesi, BademaltÛ± Sokak, No 21/B,...

                                             Locality  \
0          Century City Mall, Poblacion, Makati City
1          Little Tokyo, Legaspi Village, Makati City
2        Edsa Shangri-La, Ortigas, Mandaluyong City
3             SM Megamall, Ortigas, Mandaluyong City
4             SM Megamall, Ortigas, Mandaluyong City
...                                               ...
9546                                       Karakí_y
9547                                       Ko?ôuyolu
9548                                     Kuruí_e?ôme
9549                                     Kuruí_e?ôme
9550                                            Moda

                                     Locality Verbose   Longitude  \
0        Century City Mall, Poblacion, Makati City, Mak...  121.027535
1        Little Tokyo, Legaspi Village, Makati City, Ma...  121.014101
2        Edsa Shangri-La, Ortigas, Mandaluyong City, Ma...  121.056831
3        SM Megamall, Ortigas, Mandaluyong City, Mandal...  121.056475
4        SM Megamall, Ortigas, Mandaluyong City, Mandal...  121.057508
...                                               ...         ...
9546                         Karakí_y, ÛÁstanbul   28.977392
9547                         Ko?ôuyolu, ÛÁstanbul   29.041297
9548                       Kuruí_e?ôme, ÛÁstanbul   29.034640
```

```
9549                        Kuruí_eôme, ÛÁstanbul   29.036019
9550                             Moda, ÛÁstanbul   29.026016

       Latitude                              Cuisines  ...          Currency
\
0      14.565443          French, Japanese, Desserts  ...  Botswana Pula(P)
1      14.553708                            Japanese  ...  Botswana Pula(P)
2      14.581404  Seafood, Asian, Filipino, Indian    ...  Botswana Pula(P)
3      14.585318                     Japanese, Sushi  ...  Botswana Pula(P)
4      14.584450                     Japanese, Korean  ...  Botswana Pula(P)
...          ...                                 ...  ...               ...
9546   41.022793                             Turkish  ...  Turkish Lira(TL)
9547   41.009847   World Cuisine, Patisserie, Cafe   ...  Turkish Lira(TL)
9548   41.055817            Italian, World Cuisine    ...  Turkish Lira(TL)
9549   41.057979                    Restaurant Cafe  ...  Turkish Lira(TL)
9550   40.984776                                Cafe  ...  Turkish Lira(TL)

      Has Table booking Has Online delivery Is delivering now  \
0                   Yes                   No                No
1                   Yes                   No                No
2                   Yes                   No                No
3                    No                   No                No
4                   Yes                   No                No
...                 ...                  ...               ...
9546                 No                   No                No
9547                 No                   No                No
9548                 No                   No                No
9549                 No                   No                No
9550                 No                   No                No

      Switch to order menu Price range  Aggregate rating  Rating color  \
0                       No           3               4.8    Dark Green
1                       No           3               4.5    Dark Green
2                       No           4               4.4         Green
3                       No           4               4.9    Dark Green
4                       No           4               4.8    Dark Green
...                    ...         ...               ...           ...
9546                    No           3               NaN         Green
9547                    No           3               NaN         Green
9548                    No           4               NaN        Yellow
9549                    No           4               NaN         Green
9550                    No           2               NaN         Green

      Rating text Votes
0       Excellent   314
1       Excellent   591
2       Very Good   270
3       Excellent   365
4       Excellent   229
...           ...   ...
9546    Very Good   788
9547    Very Good  1034
9548         Good   661
9549    Very Good   901
9550    Very Good   591

[9551 rows x 21 columns]>
```

```
In [10]: df.describe()
```

Out[10]:

	Restaurant ID	Country Code	Longitude	Latitude	Average Cost for two	Price range	A
count	9.551000e+03	9551.000000	9551.000000	9551.000000	9538.000000	9551.000000	953
mean	9.051128e+06	18.365616	64.126574	25.854381	1200.748270	1.804837	
std	8.791521e+06	56.750546	41.467058	11.007935	16132.112949	0.905609	
min	5.300000e+01	1.000000	-157.948486	-41.330428	0.000000	1.000000	
25%	3.019625e+05	1.000000	77.081343	28.478713	250.000000	1.000000	
50%	6.004089e+06	1.000000	77.191964	28.570469	400.000000	2.000000	
75%	1.835229e+07	1.000000	77.282006	28.642758	700.000000	2.000000	
max	1.850065e+07	216.000000	174.832089	55.976980	800000.000000	4.000000	

```
In [11]: df.isnull()
```

Out[11]:

	Restaurant ID	Restaurant Name	Country Code	City	Address	Locality	Locality Verbose	Longitude	Latitud
0	False	False	False	False	False	False	False	False	Fals
1	False	False	False	False	False	False	False	False	Fals
2	False	False	False	False	False	False	False	False	Fals
3	False	False	False	False	False	False	False	False	Fals
4	False	False	False	False	False	False	False	False	Fals
...	...	...	...	...	...	...	...	...	.
9546	False	False	False	False	False	False	False	False	Fals
9547	False	False	False	False	False	False	False	False	Fals
9548	False	False	False	False	False	False	False	False	Fals
9549	False	False	False	False	False	False	False	False	Fals
9550	False	False	False	False	False	False	False	False	Fals

9551 rows × 21 columns

```
In [12]: df.isnull().sum()
```

```
Out[12]: 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   13
         Currency                0
         Has Table booking       0
         Has Online delivery     0
         Is delivering now       0
         Switch to order menu    0
         Price range             0
         Aggregate rating       16
         Rating color            0
         Rating text             0
         Votes                   0
         dtype: int64
```

```
In [13]: sns.heatmap(df.isnull(),yticklabels=False,cmap="viridis")
```

Out[13]: <Axes: >
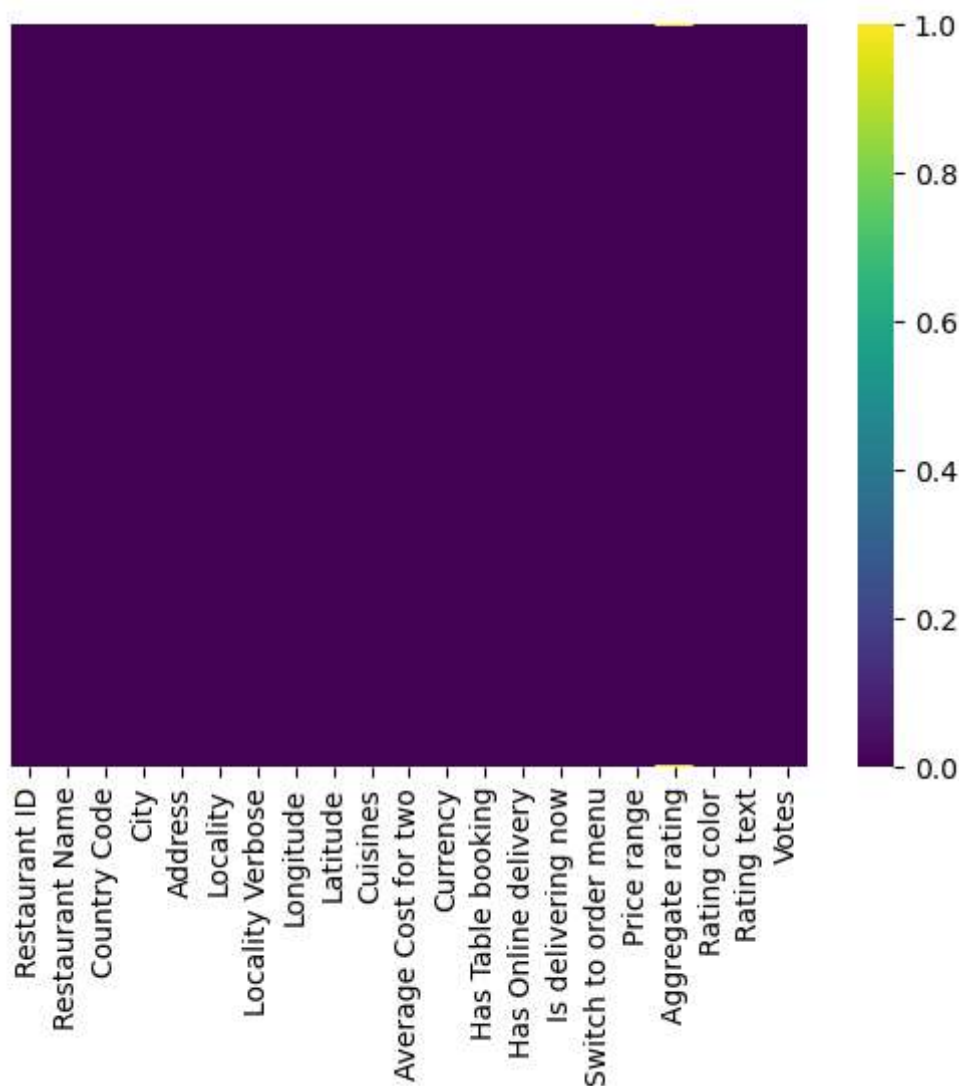
Replacing the missing values

```
In [14]: df["Average Cost for two"].fillna(df["Average Cost for two"].mean(),inplace
         df["Aggregate rating"].fillna(df["Aggregate rating"].mean(),inplace=True)
```

```
In [15]: 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 [16]: sns.heatmap(df.isnull(),yticklabels=False,cmap="viridis")
```

Out[16]: <Axes: >
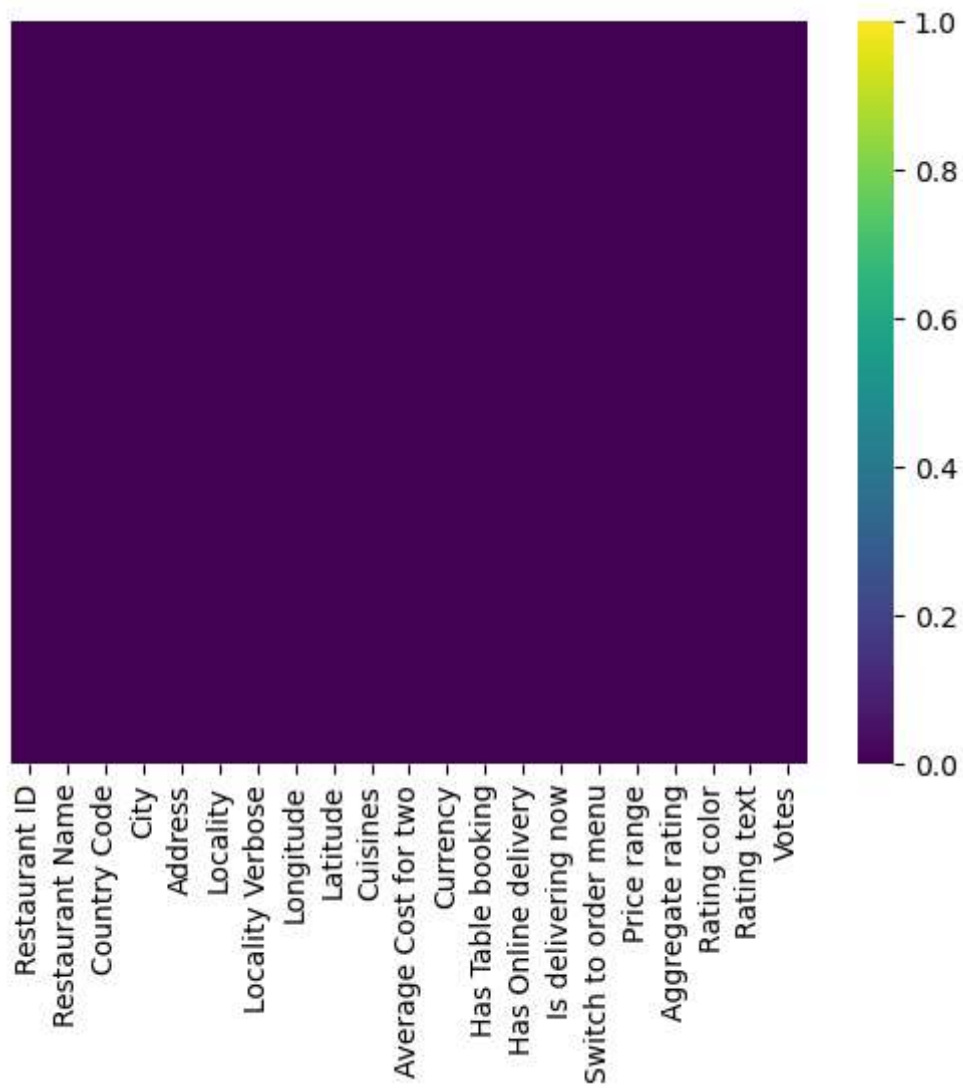
```
In [17]: plt.figure(figsize=(10,6))
         sns.scatterplot(x ="Locality Verbose",y="Votes", data=df)
```

Out[17]: <Axes: xlabel='Locality Verbose', ylabel='Votes'>

C:\Users\Ajit\anaconda3\Lib\site-packages\IPython\core\events.py:89: UserW
arning: Glyph 129 (\x81) missing from current font.
  func(*args, **kwargs)
C:\Users\Ajit\anaconda3\Lib\site-packages\IPython\core\events.py:89: UserW
arning: Glyph 136 (\x88) missing from current font.
  func(*args, **kwargs)
C:\Users\Ajit\anaconda3\Lib\site-packages\IPython\core\pylabtools.py:152:
UserWarning: Glyph 129 (\x81) missing from current font.
  fig.canvas.print_figure(bytes_io, **kw)
C:\Users\Ajit\anaconda3\Lib\site-packages\IPython\core\pylabtools.py:152:
UserWarning: Glyph 136 (\x88) missing from current font.
  fig.canvas.print_figure(bytes_io, **kw)
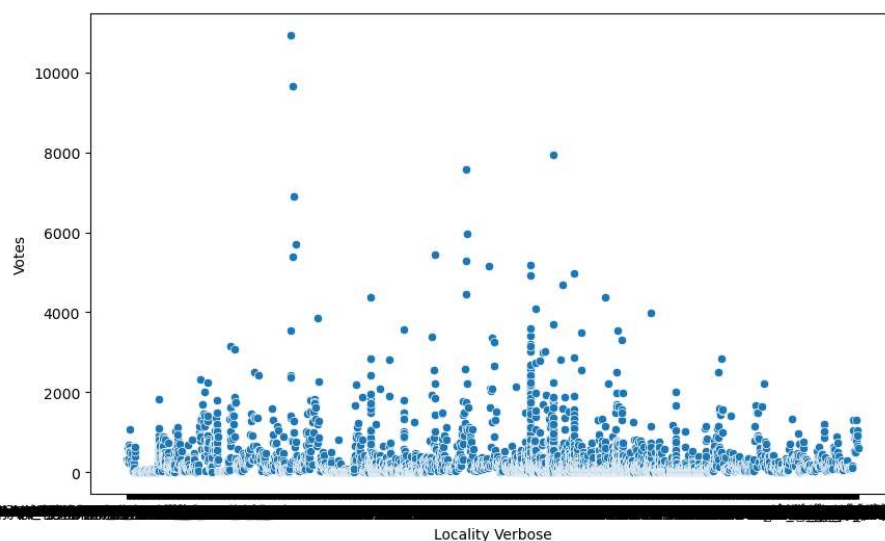
```
In [18]: plt.figure(figsize=(12,7))
         sns.scatterplot(x="Longitude", y="Latitude",data=df)
```

Out[18]: <Axes: xlabel='Longitude', ylabel='Latitude'>
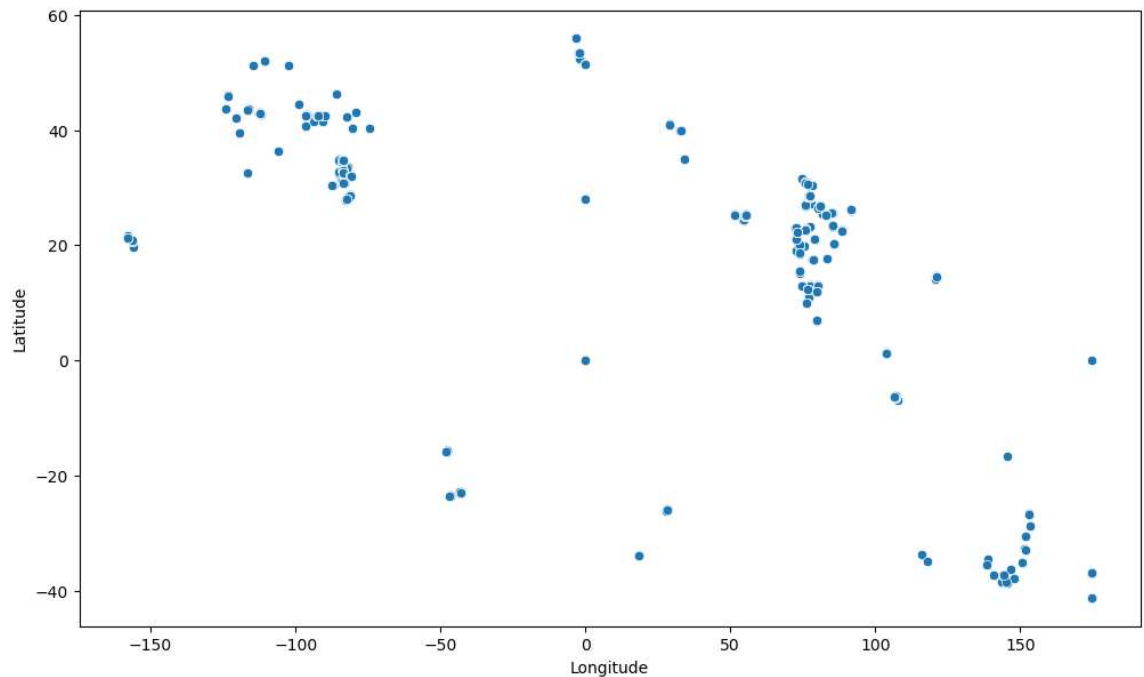

```
In [19]: plt.figure(figsize = (20, 10))
         sns.heatmap(df.corr(), annot = True)
```

C:\Users\Ajit\AppData\Local\Temp\ipykernel_1316\3391398152.py:2: FutureWar
ning: The default value of numeric_only in DataFrame.corr is deprecated. I
n a future version, it will default to False. Select only valid columns or
specify the value of numeric_only to silence this warning.
  sns.heatmap(df.corr(), annot = True)

Out[19]: <Axes: >
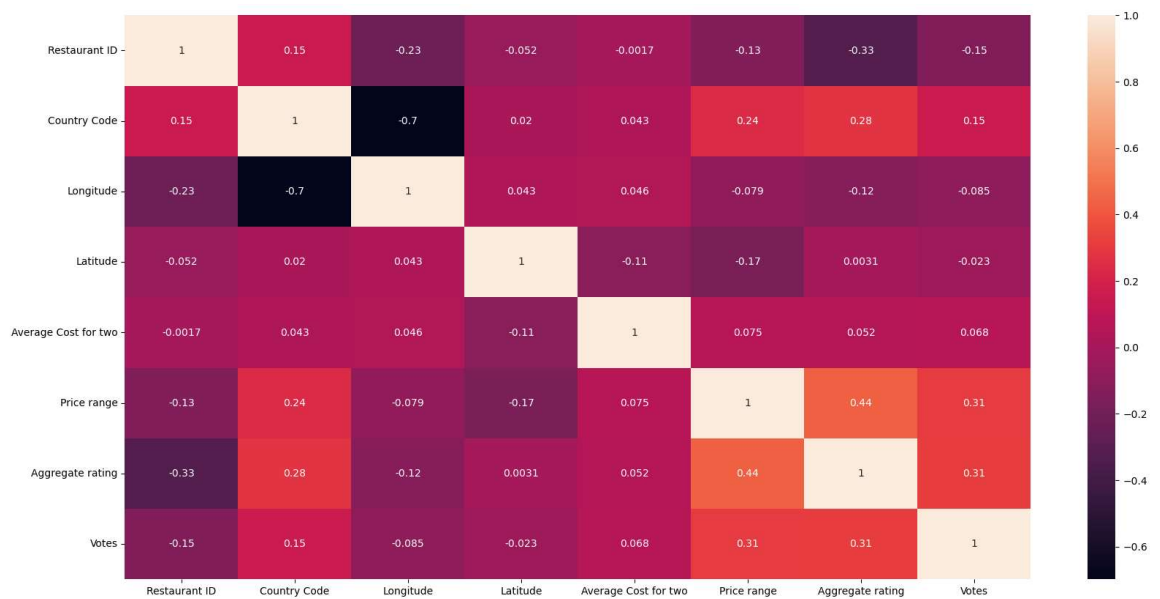
In [20]: `sns.boxplot(df)`

Out[20]: `<Axes: >`
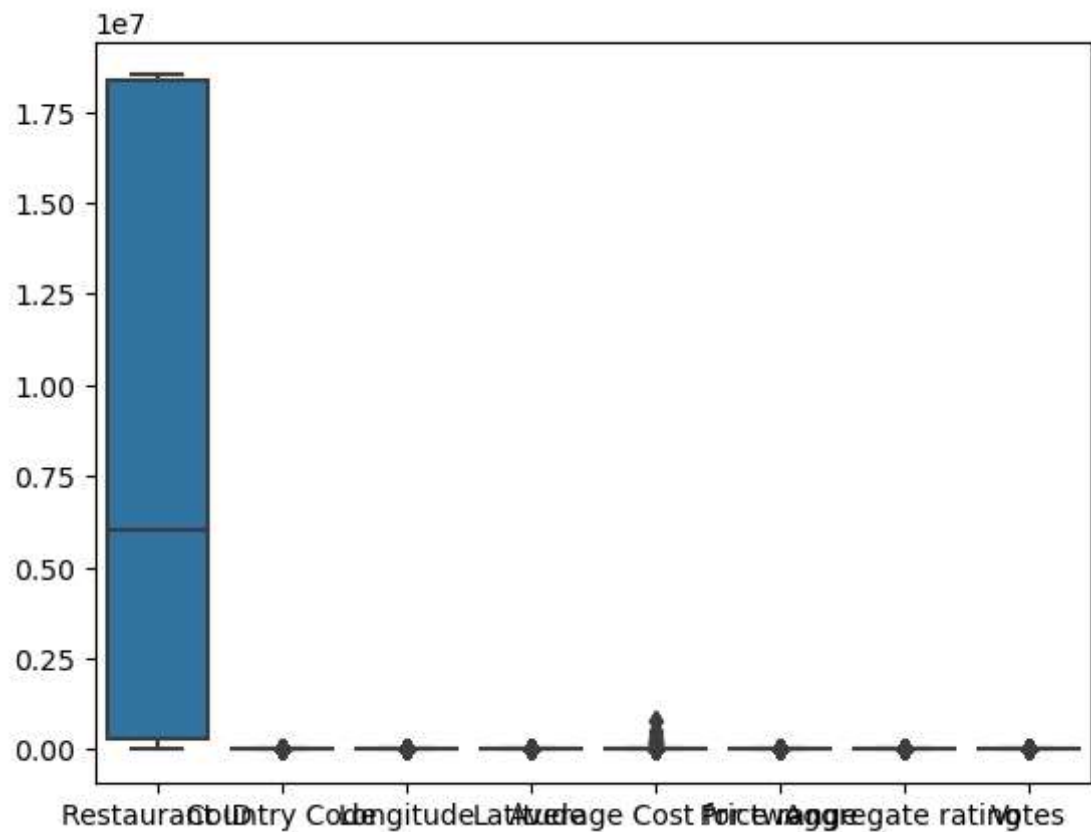
In [21]: `sns.lineplot(df)`

Out[21]: `<Axes: >`
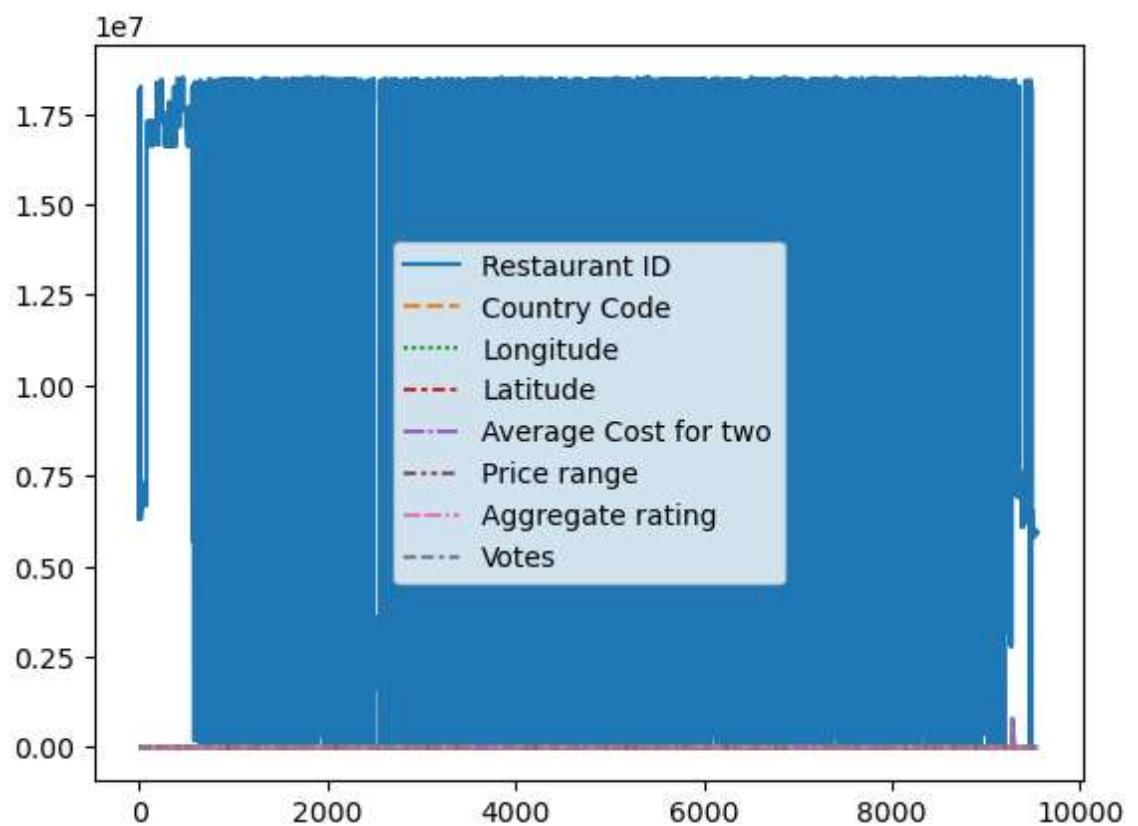
```
In [22]:  df.groupby('Aggregate rating')['Restaurant Name','Locality'].mean()
```

C:\Users\Ajit\AppData\Local\Temp\ipykernel_1316\2224048272.py:1: FutureWar
ning: Indexing with multiple keys (implicitly converted to a tuple of key
s) will be deprecated, use a list instead.
  df.groupby('Aggregate rating')['Restaurant Name','Locality'].mean()
C:\Users\Ajit\AppData\Local\Temp\ipykernel_1316\2224048272.py:1: FutureWar
ning: The default value of numeric_only in DataFrameGroupBy.mean is deprec
ated. In a future version, numeric_only will default to False. Either spec
ify numeric_only or select only columns which should be valid for the func
tion.
  df.groupby('Aggregate rating')['Restaurant Name','Locality'].mean()

Aggregate rating
0.00000
1.80000
1.90000
2.00000
2.10000
2.20000
2.30000
2.40000
2.50000
2.60000
2.66388
2.70000
2.80000
2.90000
3.00000
3.10000
3.20000
3.30000
3.40000
3.50000
3.60000
3.70000
3.80000
3.90000
4.00000
4.10000
4.20000
4.30000
4.40000
4.50000
4.60000
4.70000
4.80000
4.90000

```python
plt.figure(figsize = (7, 5))
sns.distplot(df['Restaurant ID'])
plt.show()
```

C:\Users\Ajit\AppData\Local\Temp\ipykernel_1316\3524486650.py:2: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751 (https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751)

```python
sns.distplot(df['Restaurant ID'])
```
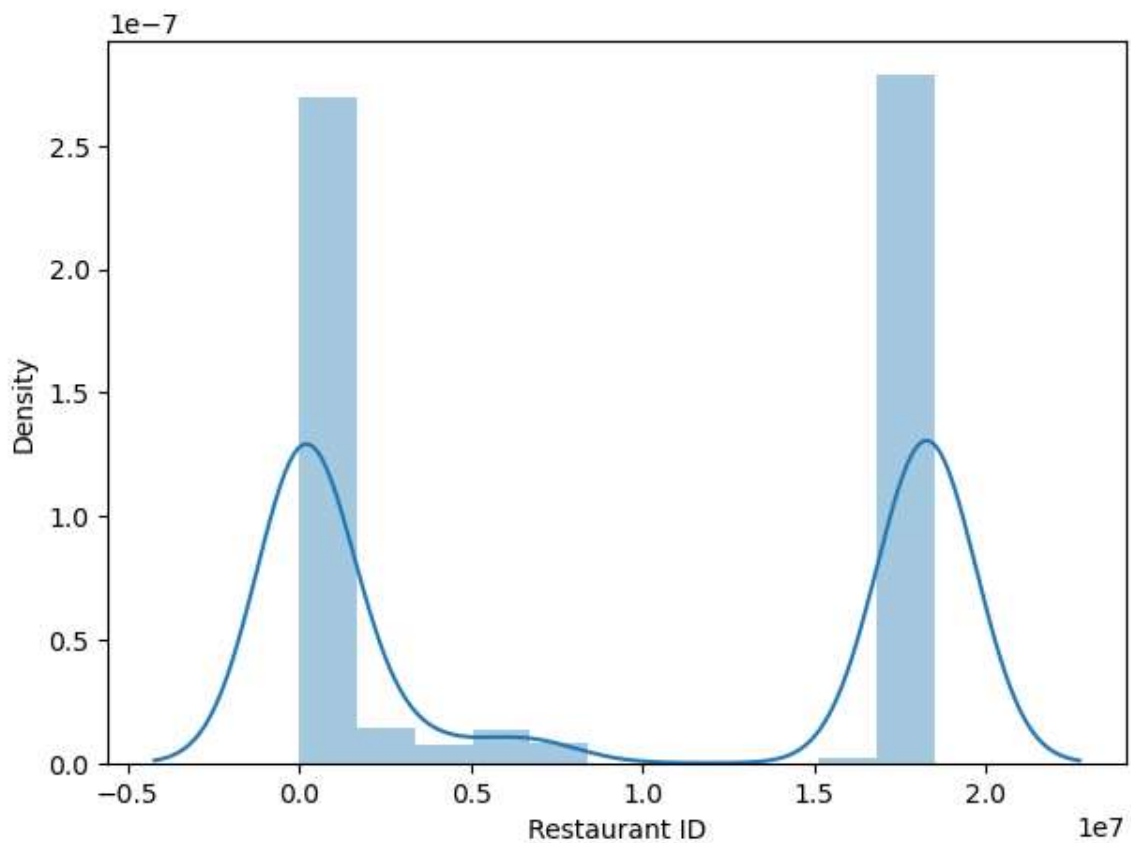
```
In [24]: sns.histplot(df["Price range"],bins=10,kde=True)
         plt.xticks(rotation=90)
         plt.show()
```
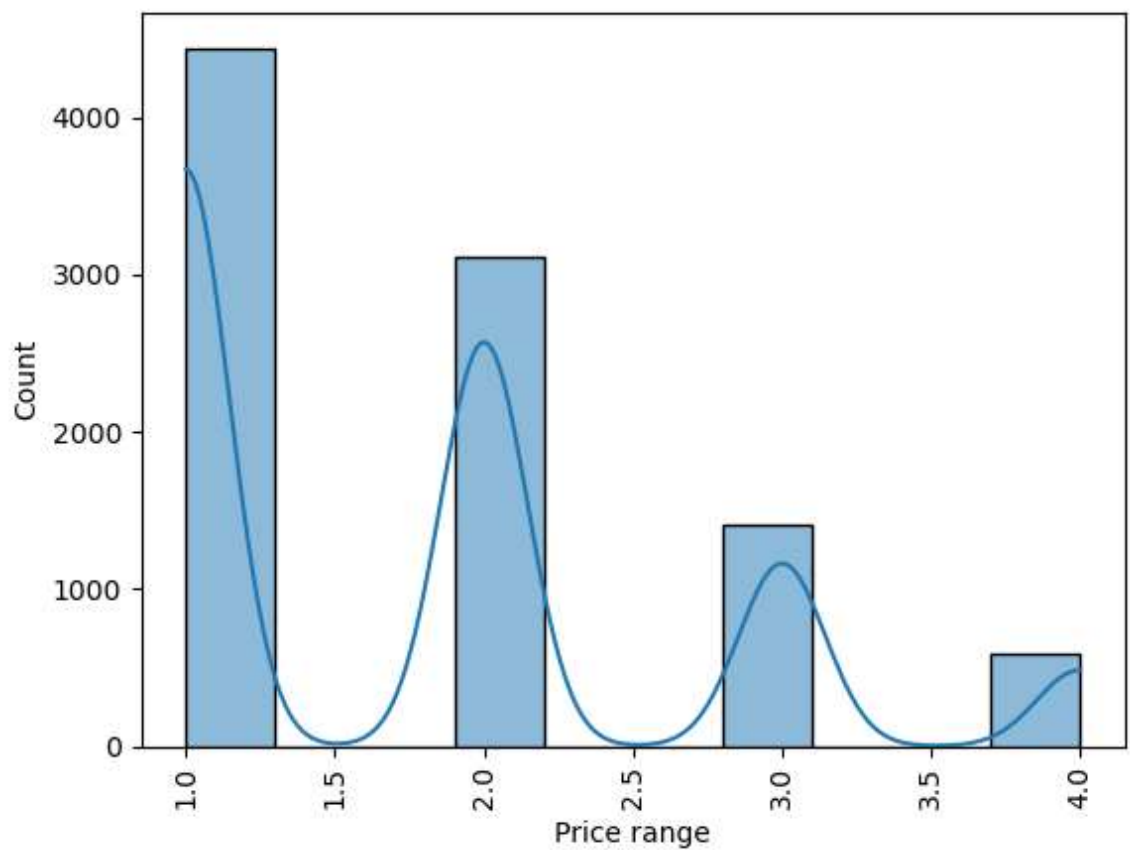


```
In [25]: sns.violinplot(x="Price range",y="Aggregate rating",data=df)
```
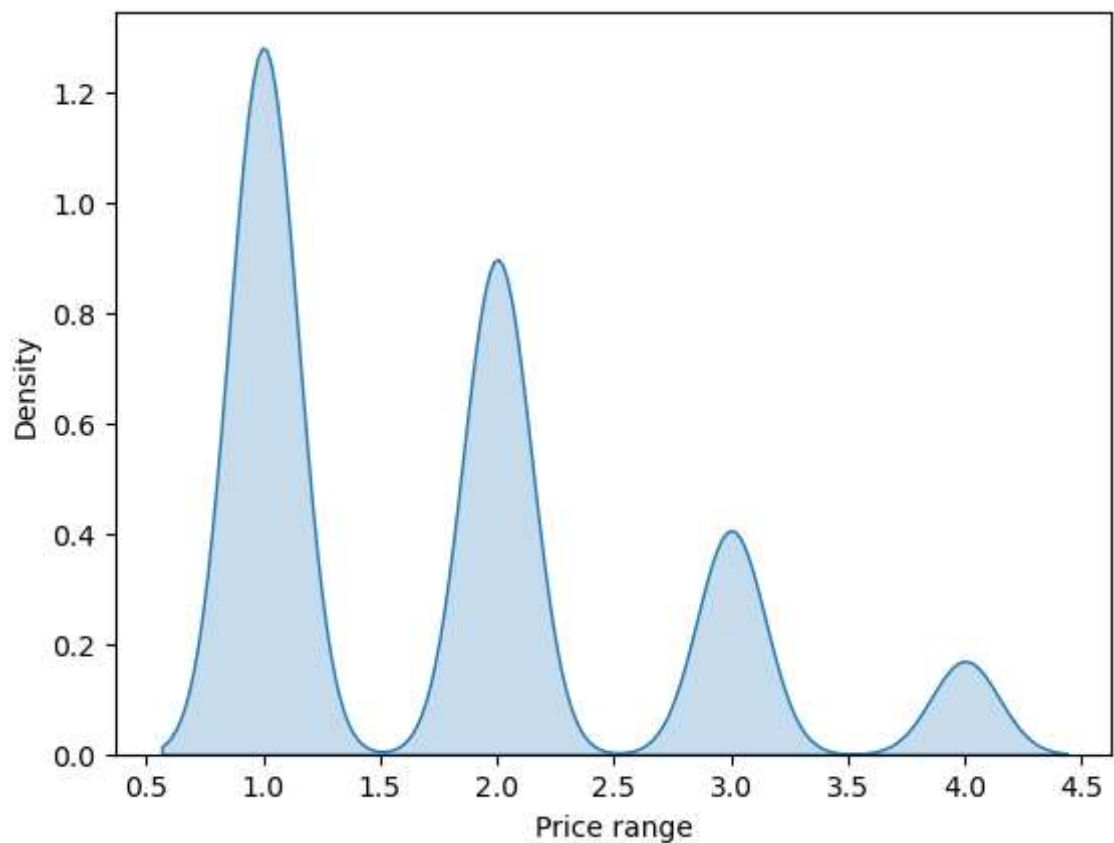
Out[25]: <Axes: xlabel='Price range', ylabel='Aggregate rating'>
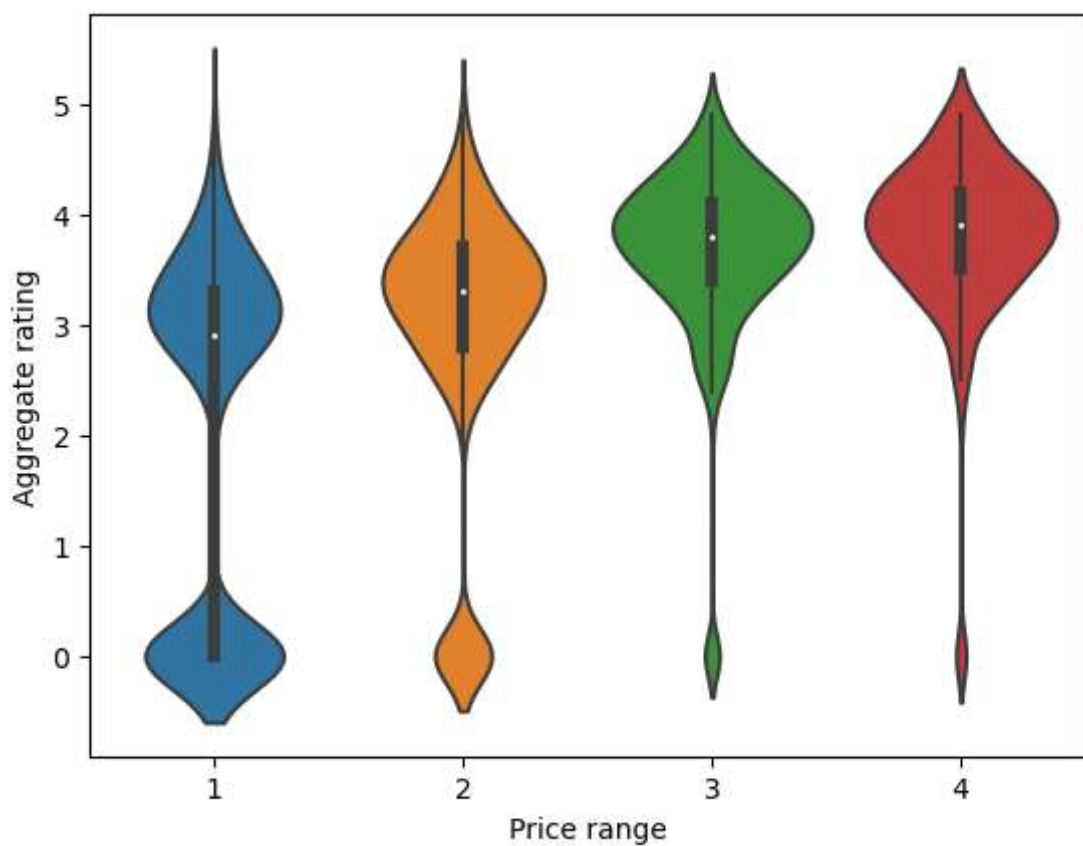
```
sns.kdeplot(df["Price range"],shade=True
             )
```

Out[26]: <Axes: xlabel='Price range', ylabel='Density'>

```
In [27]: sns.pairplot(df,diag_kind="kde")
         plt.show()
```



```
In [ ]:
```