Zomato Analysis using python

By Saima Khan

Aim: The aim of this project is to analyze Zomato restaurant data using Pandas and NumPy for data cleaning and analysis, and Seaborn and Matplotlib for visualization. The project focuses on identifying trends in restaurant types, ratings, online ordering behavior, and customer engagement to better understand overall market patterns.

```
import pandas as pd      # used for data manipulation & analysis
import numpy as np       # used for numerical operation
import matplotlib.pyplot as plt   # used for data visualization
import seaborn as sns    # used for data visualization
```

```
dataframe = pd.read_csv("Zomato data .csv")
dataframe
```

	name	online_order	book_table	rate	votes	approx_cost(for two people)	listed_in(type)
0	Jalsa	Yes	Yes	4.1/5	775	800	Buffet
1	Spice Elephant	Yes	No	4.1/5	787	800	Buffet
2	San Churro Cafe	Yes	No	3.8/5	918	800	Buffet
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	300	Buffet
4	Grand Village	No	No	3.8/5	166	600	Buffet
...	...	...	...	...	...	...	...
143	Melting Melodies	No	No	3.3/5	0	100	Dining
144	New Indraprasta	No	No	3.3/5	0	150	Dining
145	Anna Kuteera	Yes	No	4.0/5	771	450	Dining
146	Darbar	No	No	3.0/5	98	800	Dining
147	Vijayalakshmi	Yes	No	3.9/5	47	200	Dining

148 rows × 7 columns

Data cleaning process

```
# We remove /5 to convert the rating into a clean numeric value so it can be properly analyzed,compared,& used in calculations like averages & sorting.
dataframe["rate"] = dataframe["rate"].str.replace("/5", "",regex=False)     # regex=False for exact match
dataframe
```

	name	online_order	book_table	rate	votes	approx_cost(for two people)	listed_in(type)
44	Onesta	Yes	Yes	4.6	2556	600	other
7	Onesta	Yes	Yes	4.6	2556	600	Cafes
38	Empire Restaurant	Yes	No	4.4	4884	750	other
86	Meghana Foods	Yes	No	4.4	4401	600	Dining
52	Corner House Ice Cream	No	No	4.3	345	400	Dining
...	...	...	...	...	...	...	...
126	Banashankari Nati Style	No	No	2.9	0	350	Dining
125	Soms Kitchen & Bakes	No	No	2.9	0	400	Dining
31	Foodiction	Yes	No	2.8	506	500	other
36	Fast And Fresh	Yes	No	2.8	91	400	Dining
94	Nandhini Deluxe	No	No	2.6	283	600	Dining

148 rows × 7 columns

```
dataframe['rate'] = dataframe['rate'].str.strip()  # Remove any spaces
```

```
dataframe.info() # return dataset info
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 148 entries, 44 to 94
Data columns (total 7 columns):
 #   Column                       Non-Null Count  Dtype
---  ------                       --------------  -----
 0   name                         148 non-null    object
 1   online_order                 148 non-null    object
 2   book_table                   148 non-null    object
 3   rate                         148 non-null    object
 4   votes                        148 non-null    int64
 5   approx_cost(for two people)  148 non-null    int64
 6   listed_in(type)              148 non-null    object
dtypes: int64(2), object(5)
memory usage: 9.2+ KB
```

```
dataframe.isnull().sum()  # check null value
```

```
name                           0
online_order                   0
book_table                     0
rate                           0
votes                          0
approx_cost(for two people)    0
listed_in(type)                0
dtype: int64
```

Visualization

```
top_restaurants = dataframe.sort_values(by=['rate', 'votes'], ascending=False).head(10)
top_restaurants[['name', 'rate', 'votes']]
```

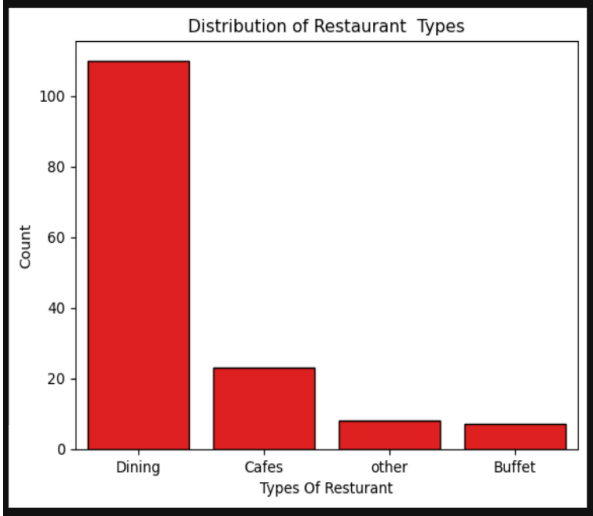
	name	rate	votes
44	Onesta	4.6	2556
7	Onesta	4.6	2556
38	Empire Restaurant	4.4	4884
86	Meghana Foods	4.4	4401
52	Corner House Ice Cream	4.3	345
37	Szechuan Dragon	4.2	1647
9	Smacznego	4.2	504
34	Faasos	4.2	415
57	Wamama	4.2	354
60	Peppy Peppers	4.2	244

Conclusion:Top restaurants combine high ratings with many votes, showing strong popularity and customer trust.

```
sns.countplot(
            x=dataframe['listed_in(type)'],
            order=dataframe['listed_in(type)'].value_counts().index,  # order controls the sequence of categories shown on the axis.
            color='red',
            edgecolor='black')

plt.xlabel("Types Of Resturant")
plt.ylabel("Count")
plt.title("Distribution of Restaurant  Types")
```

```
Text(0.5, 1.0, 'Distribution of Restaurant  Types')
```



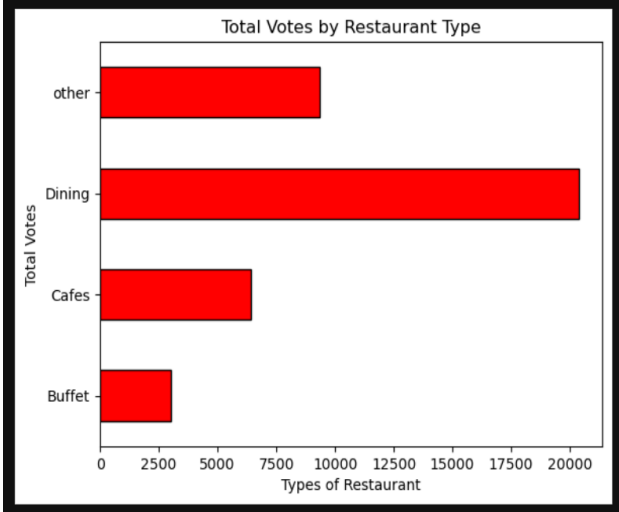
Conclusion:Most restaurants are dining-type, followed by cafes, while buffet and other types are few, showing dine-in dominance.

```
# Group votes by restaurant type
grouped_data = dataframe.groupby('listed_in(type)')['votes'].sum()
result = pd.DataFrame({'votes': grouped_data})

result['votes'].plot(kind='barh',color='red',edgecolor='black')  # Plot

plt.xlabel("Types of Restaurant")
plt.ylabel("Total Votes")
plt.title("Total Votes by Restaurant Type")
```

```
Text(0.5, 1.0, 'Total Votes by Restaurant Type')
```

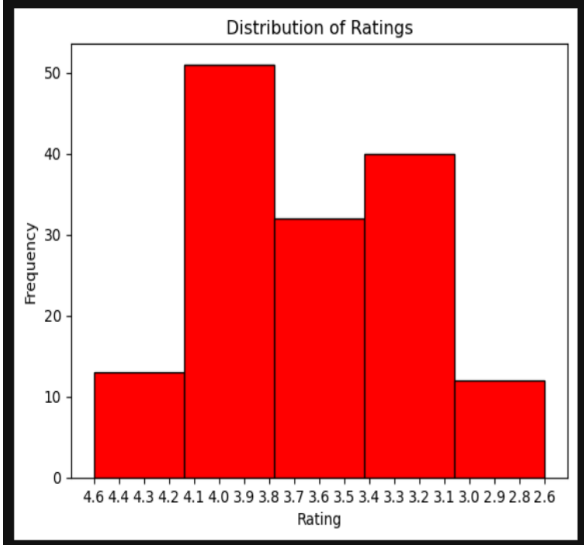


Conclusion:Dining restaurants received the highest total votes,

```
dataframe = dataframe.sort_values(by='rate', ascending=False)

plt.hist(dataframe['rate'], bins=5, color='red', edgecolor='black')
plt.xlabel('Rating')
plt.ylabel('Frequency')
plt.title('Distribution of Ratings')
```

```
Text(0.5, 1.0, 'Distribution of Ratings')
```

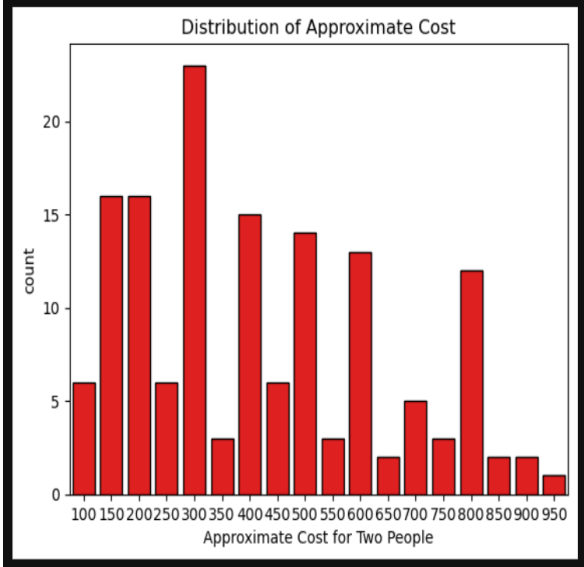


Conclusion:the majority resturants received ratings from 3.5 to 5

```
couple_data = dataframe['approx_cost(for two people)']    # Select the column
sns.countplot(x=couple_data, color='red',
              edgecolor='black')  # Plot countplot

plt.xlabel("Approximate Cost for Two People")
plt.title("Distribution of Approximate Cost")
```

```
Text(0.5, 1.0, 'Distribution of Approximate Cost')
```



Conclusion:The majority of couples preffer resturants with an approximate cost of 300 rupees

```
dataframe = dataframe.sort_values(by='rate', ascending=False)
sns.boxplot(x="online_order", y="rate", data=dataframe,color="red")

plt.xlabel("Online Order")
plt.ylabel("Rating")
plt.title("Rating Distribution:Online vs Offline Orders")
```

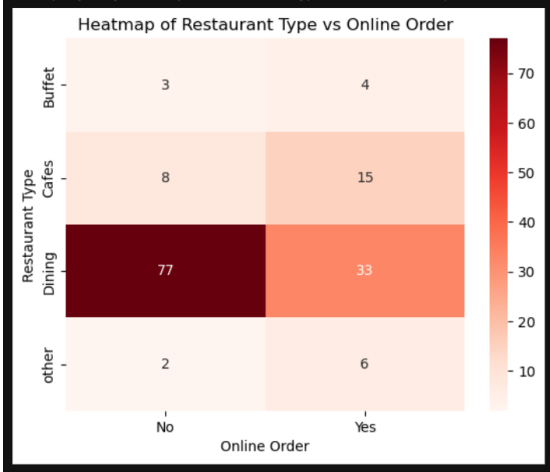
```
Text(0.5, 1.0, 'Rating Distribution:Online vs Offline Orders')
```

Conclusion:Offline order received lower ratings in comparision to online order

```
pivot_table = dataframe.pivot_table(
                                    index='listed_in(type)',
                                    columns='online_order',
                                    aggfunc='size',
                                    fill_value=0)
sns.heatmap(pivot_table, annot=True, cmap="Reds", fmt='d')

plt.xlabel("Online Order")
plt.ylabel("Restaurant Type")
plt.title("Heatmap of Restaurant Type vs Online Order")
```

```
Text(0.5, 1.0, 'Heatmap of Restaurant Type vs Online Order')
```



Conclusion:Dinning restaurants primarily accept offline orders,whereas cafes primarily receive online orders.This suggests that clients prefer orders in person at restaurants,but prefer online ordering at cafes.

```
dataframe['rate'] = pd.to_numeric(dataframe['rate'], errors='coerce')
```

```
# Use NumPy to calculate mean
avg_rate = np.mean(top_restaurants['rate'])
avg_votes = np.mean(top_restaurants['votes'])

print("Average Rating of Top Restaurants:", avg_rate)
print("Average Votes of Top Restaurants:", avg_votes)
```

```
Average Rating of Top Restaurants: 4.33
Average Votes of Top Restaurants: 1790.6
```

ThankYou!!!