

Exploratory Data Analysis using Python

Dataset contains information about restaurants in Bangalore working with Zomato.

Following task will be performed on the data:

- 1) Data Cleaning
- 2) Data Visualization

1) Data Cleaning

Import Libraries

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

Read Data

```
In [2]: zomato = pd.read_csv(r'C:\Users\patil\Desktop\Project 1\zomato.csv\zomato.csv')  
zomato.head(3)
```

Out[2]:

	url	address	name	online_order	book_table	rate	votes	phone	location	rest_type	dish_liked
0	https://www.zomato.com/bangalore/jalsa-banashankari?cont...	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	Yes	Yes	4.1/5	775	080 42297555\r\n+91 9743772233	Banashankari	Casual Dining	Pa Lui Buf Mas Pap Pan La
1	https://www.zomato.com/bangalore/spice-elephant?cont...	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	Yes	No	4.1/5	787	080 41714161	Banashankari	Casual Dining	Mon Lui Buf Chocol Nirva Thai
2	https://www.zomato.com/SanchurroBangalore?cont...	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	Yes	No	3.8/5	918	+91 9663487993	Banashankari	Cafe, Casual Dining	Churi Cannelle Minestrone Soup, I Choc

Delete unnecessary columns

In [3]: `zomato.drop(columns = ['url', 'address', 'phone', 'dish_liked', 'reviews_list', 'menu_item'], inplace=True)`In [4]: `zomato.head(1)`

Out[4]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	approx_cost(for two people)	listed_in(type)	listed_in(city)
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	800	Buffet	Banashankari

Renaming Columns

In [5]: `zomato.rename(columns = {'name': 'restaurant', 'rate': 'rating', 'approx_cost(for two people)': 'cost', 'listed_in(type)': 'type', 'listed_in(city)': 'city'}, inplace=True)`

```
In [6]: zomato.head(1)
```

```
Out[6]:   restaurant  online_order  book_table  rating  votes  location  rest_type  cuisines  cost  type  city
0          Jalsa        Yes           Yes  4.1/5    775  Banashankari  Casual Dining  North Indian, Mughlai, Chinese    800  Buffet  Banashankari
```

Dropping NaN values

```
In [7]: zomato.isna().value_counts()
```

```
Out[7]: restaurant  online_order  book_table  rating  votes  location  rest_type  cuisines  cost  type  city
False        43533
True         7615
False        247
True         149
False        71
True         55
False        21
True         11
False        8
True         3
False        2
True         2
dtype: int64
```

```
In [8]: zomato.dropna(inplace=True)
```

```
In [9]: zomato.isna().value_counts()
```

```
Out[9]: restaurant  online_order  book_table  rating  votes  location  rest_type  cuisines  cost  type  city
False        43533
dtype: int64
```

Cleaning Individual Columns

Cleaning column *restaurant* : replace disturbed characters

```
In [10]: zomato['restaurant'].unique()
```

```
Out[10]: array(['Jalsa', 'Spice Elephant', 'San Churro Cafe', ...,
   'The Nest - The Den Bengaluru', 'Nawabs Empire',
   'SeeYa Restaurant'], dtype=object)
```

```
In [11]: zomato['restaurant'] = zomato['restaurant'].str.replace('[Ã][^C]+', '', regex=True)
```

```
In [12]: zomato['restaurant'].unique()
```

```
Out[12]: array(['Jalsa', 'Spice Elephant', 'San Churro Cafe', ...,
   'The Nest - The Den Bengaluru', 'Nawabs Empire',
   'SeeYa Restaurant'], dtype=object)
```

Check column *online_order*

```
In [13]: zomato['online_order'].unique()
```

```
Out[13]: array(['Yes', 'No'], dtype=object)
```

Check column *book_table*

```
In [14]: zomato['book_table'].unique()
```

```
Out[14]: array(['Yes', 'No'], dtype=object)
```

Check column *rating* : removing /5 (out of 5) value ,replace NEW with '-' (dash), change datatype to float

```
In [15]: zomato['rating'].unique()
```

```
Out[15]: array(['4.1/5', '3.8/5', '3.7/5', '3.6/5', '4.6/5', '4.0/5', '4.2/5',
   '3.9/5', '3.1/5', '3.0/5', '3.2/5', '3.3/5', '2.8/5', '4.4/5',
   '4.3/5', 'NEW', '2.9/5', '3.5/5', '2.6/5', '3.8 /5', '3.4/5',
   '4.5/5', '2.5/5', '2.7/5', '4.7/5', '2.4/5', '2.2/5', '2.3/5',
   '3.4 /5', '-', '3.6 /5', '4.8/5', '3.9 /5', '4.2 /5', '4.0 /5',
   '4.1 /5', '3.7 /5', '3.1 /5', '2.9 /5', '3.3 /5', '2.8 /5',
   '3.5 /5', '2.7 /5', '2.5 /5', '3.2 /5', '2.6 /5', '4.5 /5',
   '4.3 /5', '4.4 /5', '4.9/5', '2.1/5', '2.0/5', '1.8/5', '4.6 /5',
   '4.9 /5', '3.0 /5', '4.8 /5', '2.3 /5', '4.7 /5', '2.4 /5',
   '2.1 /5', '2.2 /5', '2.0 /5', '1.8 /5'], dtype=object)
```

```
In [16]: replace = lambda x: x.replace('/5',"")
list = []
for a in map(replace,zomato['rating']):
    if a!='NEW' and a!='-':
        var = float(a)
    list.append(var)
zomato['rating']=list
```

```
In [17]: zomato['rating'].dtype
```

```
Out[17]: dtype('float64')
```

Check column *votes*

```
In [18]: zomato['votes'].isnull().value_counts()
```

```
Out[18]: False      43533  
Name: votes, dtype: int64
```

Check column *location*

```
In [19]: zomato['location'].unique()
```

```
Out[19]: array(['Banashankari', 'Basavanagudi', 'Mysore Road', 'Jayanagar',  
   'Kumaraswamy Layout', 'Rajarajeshwari Nagar', 'Vijay Nagar',  
   'Uttarahalli', 'JP Nagar', 'South Bangalore', 'City Market',  
   'Bannerghatta Road', 'BTM', 'Kanakapura Road', 'Bommanahalli',  
   'CV Raman Nagar', 'Electronic City', 'Wilson Garden',  
   'Shanti Nagar', 'Koramangala 5th Block', 'Richmond Road', 'HSR',  
   'Marathahalli', 'Koramangala 7th Block', 'Bellandur',  
   'Sarjapur Road', 'Whitefield', 'East Bangalore',  
   'Old Airport Road', 'Indiranagar', 'Koramangala 1st Block',  
   'Frazer Town', 'MG Road', 'Brigade Road', 'Lavelle Road',  
   'Church Street', 'Ulsoor', 'Residency Road', 'Shivajinagar',  
   'Infantry Road', 'St. Marks Road', 'Cunningham Road',  
   'Race Course Road', 'Commercial Street', 'Vasanth Nagar', 'Domlur',  
   'Koramangala 8th Block', 'Ejipura', 'Jeevan Bhima Nagar',  
   'Old Madras Road', 'Seshadripuram', 'Kammanahalli',  
   'Koramangala 6th Block', 'Majestic', 'Langford Town',  
   'Central Bangalore', 'Sanjay Nagar', 'Brookefield',  
   'ITPL Main Road, Whitefield', 'Varthur Main Road, Whitefield',  
   'Koramangala 2nd Block', 'Koramangala 3rd Block',  
   'Koramangala 4th Block', 'Koramangala', 'Hosur Road',  
   'Rajajinagar', 'RT Nagar', 'Banaswadi', 'North Bangalore',  
   'Nagawara', 'Hennur', 'Kalyan Nagar', 'HBR Layout',  
   'Rammurthy Nagar', 'Thippasandra', 'Kaggadasapura', 'Hebbal',  
   'Kengeri', 'New BEL Road', 'Sankey Road', 'Malleshwaram',  
   'Sadashiv Nagar', 'Basaveshwara Nagar', 'Yeshwantpur',  
   'West Bangalore', 'Magadi Road', 'Yelahanka', 'Sahakara Nagar',  
   'Jalahalli', 'Nagarbhavi', 'Peenya', 'KR Puram'], dtype=object)
```

Check column *rest_type*

```
In [20]: zomato['rest_type'].isnull().value_counts(), zomato['rest_type'].unique()
```

```
Out[20]: (False    43533
          Name: rest_type, dtype: int64,
          array(['Casual Dining', 'Cafe, Casual Dining', 'Quick Bites',
                  'Casual Dining, Cafe', 'Cafe', 'Quick Bites, Cafe',
                  'Cafe, Quick Bites', 'Delivery', 'Mess', 'Dessert Parlor',
                  'Bakery, Dessert Parlor', 'Pub', 'Bakery', 'Takeaway, Delivery',
                  'Fine Dining', 'Beverage Shop', 'Sweet Shop', 'Bar',
                  'Dessert Parlor, Sweet Shop', 'Bakery, Quick Bites',
                  'Sweet Shop, Quick Bites', 'Kiosk', 'Food Truck',
                  'Quick Bites, Dessert Parlor', 'Beverage Shop, Quick Bites',
                  'Beverage Shop, Dessert Parlor', 'Takeaway', 'Pub, Casual Dining',
                  'Casual Dining, Bar', 'Dessert Parlor, Beverage Shop',
                  'Quick Bites, Bakery', 'Microbrewery, Casual Dining', 'Lounge',
                  'Bar, Casual Dining', 'Food Court', 'Cafe, Bakery', 'Dhaba',
                  'Quick Bites, Sweet Shop', 'Microbrewery',
                  'Food Court, Quick Bites', 'Quick Bites, Beverage Shop',
                  'Pub, Bar', 'Casual Dining, Pub', 'Lounge, Bar',
                  'Dessert Parlor, Quick Bites', 'Food Court, Dessert Parlor',
                  'Casual Dining, Sweet Shop', 'Food Court, Casual Dining',
                  'Casual Dining, Microbrewery', 'Lounge, Casual Dining',
                  'Cafe, Food Court', 'Beverage Shop, Cafe', 'Cafe, Dessert Parlor',
                  'Dessert Parlor, Cafe', 'Dessert Parlor, Bakery',
                  'Microbrewery, Pub', 'Bakery, Food Court', 'Club',
                  'Quick Bites, Food Court', 'Bakery, Cafe', 'Pub, Cafe',
                  'Casual Dining, Irani Cafee', 'Fine Dining, Lounge',
                  'Bar, Quick Bites', 'Confectionery', 'Pub, Microbrewery',
                  'Microbrewery, Lounge', 'Fine Dining, Microbrewery',
                  'Fine Dining, Bar', 'Dessert Parlor, Kiosk', 'Bhojanalya',
                  'Casual Dining, Quick Bites', 'Cafe, Bar', 'Casual Dining, Lounge',
                  'Bakery, Beverage Shop', 'Microbrewery, Bar', 'Cafe, Lounge',
                  'Bar, Pub', 'Lounge, Cafe', 'Club, Casual Dining',
                  'Quick Bites, Mess', 'Quick Bites, Meat Shop',
                  'Quick Bites, Kiosk', 'Lounge, Microbrewery',
                  'Food Court, Beverage Shop', 'Dessert Parlor, Food Court',
                  'Bar, Lounge'], dtype=object))
```

Check column *cuisines*

```
In [21]: zomato['cuisines'].isnull().value_counts(),zomato['cuisines'].unique()
```

```
Out[21]: (False    43533
          Name: cuisines, dtype: int64,
          array(['North Indian, Mughlai, Chinese', 'Chinese, North Indian, Thai',
                  'Cafe, Mexican, Italian', ..., 'Tibetan, Nepalese',
                  'North Indian, Street Food, Biryani',
                  'North Indian, Chinese, Arabian, Momos'], dtype=object))
```

Check column *cost* : column needs to be cleaned for comma and then data type to be converted into int

```
In [22]: zomato['cost'].isnull().value_counts(),zomato['cost'].unique()
```

```
Out[22]: (False    43533
          Name: cost, dtype: int64,
          array(['800', '300', '600', '700', '550', '500', '450', '650', '400',
                 '900', '200', '750', '150', '850', '100', '1,200', '350', '250',
                 '950', '1,000', '1,500', '1,300', '199', '80', '1,100', '160',
                 '1,600', '230', '130', '1,700', '1,400', '1,350', '2,200', '2,000',
                 '1,800', '1,900', '180', '330', '2,500', '2,100', '3,000', '2,800',
                 '3,400', '50', '40', '1,250', '3,500', '4,000', '2,400', '2,600',
                 '1,450', '70', '3,200', '560', '240', '360', '6,000', '1,050',
                 '2,300', '4,100', '120', '5,000', '3,700', '1,650', '2,700',
                 '4,500'], dtype=object))
```

```
In [23]: zomato['cost'] = zomato['cost'].apply(lambda x:x.replace(',','')).astype(int)
```

```
In [24]: zomato['cost'].isnull().value_counts(),zomato['cost'].unique()
```

```
Out[24]: (False    43533
          Name: cost, dtype: int64,
          array([ 800,  300,  600,  700,  550,  500,  450,  650,  400,  900,  200,
                 750,  150,  850,  100, 1200,  350,  250,  950, 1000, 1500, 1300,
                 199,   80, 1100,  160, 1600,  230,  130, 1700, 1400, 1350, 2200,
                 2000, 1800, 1900,  180,  330, 2500, 2100, 3000, 2800, 3400,   50,
                  40, 1250, 3500, 4000, 2400, 2600, 1450,   70, 3200,  560,  240,
                 360, 6000, 1050, 2300, 4100,  120, 5000, 3700, 1650, 2700, 4500]))
```

Check column type

```
In [25]: zomato['type'].unique()
```

```
Out[25]: array(['Buffet', 'Cafes', 'Delivery', 'Desserts', 'Dine-out',
                 'Drinks & nightlife', 'Pubs and bars'], dtype=object)
```

Check column city

```
In [26]: zomato['city'].unique()
```

```
Out[26]: array(['Banashankari', 'Bannerghatta Road', 'Basavanagudi', 'Bellandur',
                 'Brigade Road', 'Brookefield', 'BTM', 'Church Street',
                 'Electronic City', 'Frazer Town', 'HSR', 'Indiranagar',
                 'Jayanagar', 'JP Nagar', 'Kalyan Nagar', 'Kammanahalli',
                 'Koramangala 4th Block', 'Koramangala 5th Block',
                 'Koramangala 6th Block', 'Koramangala 7th Block', 'Lavelle Road',
                 'Malleshwaram', 'Marathahalli', 'MG Road', 'New BEL Road',
                 'Old Airport Road', 'Rajajinagar', 'Residency Road',
                 'Sarjapur Road', 'Whitefield'], dtype=object)
```

Dropping duplicate values

```
In [27]: zomato.duplicated().value_counts()
```

```
Out[27]: False    43453  
True      80  
dtype: int64
```

We can see there are 80 duplicate values. We will delete the duplicates and keep the latest entries

```
In [28]: zomato.drop_duplicates(keep='last', inplace=True)
```

```
In [29]: zomato.duplicated().value_counts()
```

```
Out[29]: False    43453  
dtype: int64
```

```
In [30]: zomato
```

Out[30]:

	restaurant	online_order	book_table	rating	votes	location	rest_type	cuisines	cost	type	city
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	800	Buffet	Banashankari
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	800	Buffet	Banashankari
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	800	Buffet	Banashankari
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	300	Buffet	Banashankari
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	600	Buffet	Banashankari
...
51709	The Farm House Bar n Grill	No	No	3.7	34	Whitefield	Casual Dining, Bar	North Indian, Continental	800	Pubs and bars	Whitefield
51711	Bhagini	No	No	2.5	81	Whitefield	Casual Dining, Bar	Andhra, South Indian, Chinese, North Indian	800	Pubs and bars	Whitefield
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	Continental	1500	Pubs and bars	Whitefield
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	Finger Food	2500	Pubs and bars	Whitefield
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	Finger Food, North Indian, Continental	1500	Pubs and bars	Whitefield

43453 rows × 11 columns

In [31]: `zomato.info()`

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 43453 entries, 0 to 51716
Data columns (total 11 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   restaurant    43453 non-null   object  
 1   online_order   43453 non-null   object  
 2   book_table     43453 non-null   object  
 3   rating         43453 non-null   float64 
 4   votes          43453 non-null   int64  
 5   location        43453 non-null   object  
 6   rest_type       43453 non-null   object  
 7   cuisines        43453 non-null   object  
 8   cost            43453 non-null   int32  
 9   type            43453 non-null   object  
 10  city            43453 non-null   object  
dtypes: float64(1), int32(1), int64(1), object(8)
memory usage: 3.8+ MB
```

```
In [32]: zomato.to_csv(r'C:\Users\patil\Desktop\Project 1\zomato_cleaned.csv')
```

```
In [33]: zomato
```

Out[33]:

	restaurant	online_order	book_table	rating	votes	location	rest_type	cuisines	cost	type	city
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	800	Buffet	Banashankari
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	800	Buffet	Banashankari
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	800	Buffet	Banashankari
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	300	Buffet	Banashankari
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	600	Buffet	Banashankari
...
51709	The Farm House Bar n Grill	No	No	3.7	34	Whitefield	Casual Dining, Bar	North Indian, Continental	800	Pubs and bars	Whitefield
51711	Bhagini	No	No	2.5	81	Whitefield	Casual Dining, Bar	Andhra, South Indian, Chinese, North Indian	800	Pubs and bars	Whitefield
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	Continental	1500	Pubs and bars	Whitefield
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	Finger Food	2500	Pubs and bars	Whitefield
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	Finger Food, North Indian, Continental	1500	Pubs and bars	Whitefield

43453 rows × 11 columns

2) Data Visualisation

- Table showing number of restaurants who provide service like online order and table booking

In [34]:

```
col1 = ['city','online_order']
col2 = ['city','book_table']
```

```
tab1 = zomato[col1]
tab2 = zomato[col2]

tab_1 = tab1.groupby('city')['online_order'].value_counts(normalize=True).to_frame(name='online_order_acceptance')
tab_1['online_order_acceptance'] = round(tab_1['online_order_acceptance'],4)*100
tab_1 = tab_1.filter(like='Yes',axis=0)
tab_1.reset_index(inplace=True)
tab_1 = tab_1.drop(['online_order'],axis=1)

tab_2 = tab2.groupby('city')['book_table'].value_counts(normalize=True).to_frame(name='book_table_acceptance')
tab_2['book_table_acceptance'] = round(tab_2['book_table_acceptance'],4)*100
tab_2 = tab_2.filter(like='Yes',axis=0)
tab_2.reset_index(inplace=True)
tab_2 = tab_2.drop(['book_table'],axis=1)
```

```
In [35]: tab_1.set_index('city')
```

Out[35]:

online_order_acceptance	
city	
BTM	70.87
Banashankari	68.80
Bannerghatta Road	69.92
Basavanagudi	66.58
Bellandur	72.71
Brigade Road	54.49
Brookefield	70.24
Church Street	51.38
Electronic City	55.86
Frazer Town	66.16
HSR	75.35
Indiranagar	60.85
JP Nagar	70.62
Jayanagar	73.11
Kalyan Nagar	67.88
Kammanahalli	67.01
Koramangala 4th Block	70.07
Koramangala 5th Block	68.45
Koramangala 6th Block	68.12
Koramangala 7th Block	66.98
Lavelle Road	47.58
MG Road	52.71
Malleshwaram	64.68
Marathahalli	64.76
New BEL Road	64.38
Old Airport Road	62.61
Rajajinagar	57.21

online_order_acceptance

city	
Residency Road	48.22
Sarjapur Road	68.88
Whitefield	61.89

In [36]: `tab_2.set_index('city')`

Out[36]:

book_table_acceptance

city	
BTM	13.77
Banashankari	5.48
Bannerghatta Road	8.84
Basavanagudi	10.79
Bellandur	12.96
Brigade Road	22.72
Brookefield	9.92
Church Street	22.99
Electronic City	10.13
Frazer Town	12.99
HSR	12.40
Indiranagar	20.18
JP Nagar	10.78
Jayanagar	11.99
Kalyan Nagar	11.24
Kammanahalli	10.15
Koramangala 4th Block	15.52
Koramangala 5th Block	15.16
Koramangala 6th Block	14.61
Koramangala 7th Block	15.32
Lavelle Road	21.95
MG Road	22.90
Malleshwaram	12.73
Marathahalli	11.30
New BEL Road	8.56
Old Airport Road	18.61
Rajajinagar	10.06

book_table_acceptance

city	
Residency Road	22.37
Sarjapur Road	12.14
Whitefield	15.21

```
In [37]: tab_comb = tab_1.merge(tab_2,how='outer',on='city')
```

```
In [38]: tab_comb
```

Out[38]:

	city	online_order_acceptance	book_table_acceptance
0	BTM	70.87	13.77
1	Banashankari	68.80	5.48
2	Bannerghatta Road	69.92	8.84
3	Basavanagudi	66.58	10.79
4	Bellandur	72.71	12.96
5	Brigade Road	54.49	22.72
6	Brookefield	70.24	9.92
7	Church Street	51.38	22.99
8	Electronic City	55.86	10.13
9	Frazer Town	66.16	12.99
10	HSR	75.35	12.40
11	Indiranagar	60.85	20.18
12	JP Nagar	70.62	10.78
13	Jayanagar	73.11	11.99
14	Kalyan Nagar	67.88	11.24
15	Kammanahalli	67.01	10.15
16	Koramangala 4th Block	70.07	15.52
17	Koramangala 5th Block	68.45	15.16
18	Koramangala 6th Block	68.12	14.61
19	Koramangala 7th Block	66.98	15.32
20	Lavelle Road	47.58	21.95
21	MG Road	52.71	22.90
22	Malleshwaram	64.68	12.73
23	Marathahalli	64.76	11.30
24	New BEL Road	64.38	8.56
25	Old Airport Road	62.61	18.61
26	Rajajinagar	57.21	10.06
27	Residency Road	48.22	22.37

	city	online_order_acceptance	book_table_acceptance
28	Sarjapur Road	68.88	12.14
29	Whitefield	61.89	15.21

```
In [49]: x = tab_comb['city']
y = tab_comb['online_order_acceptance']
z = tab_comb['book_table_acceptance']

length = np.arange(len(x))
width = 0.4

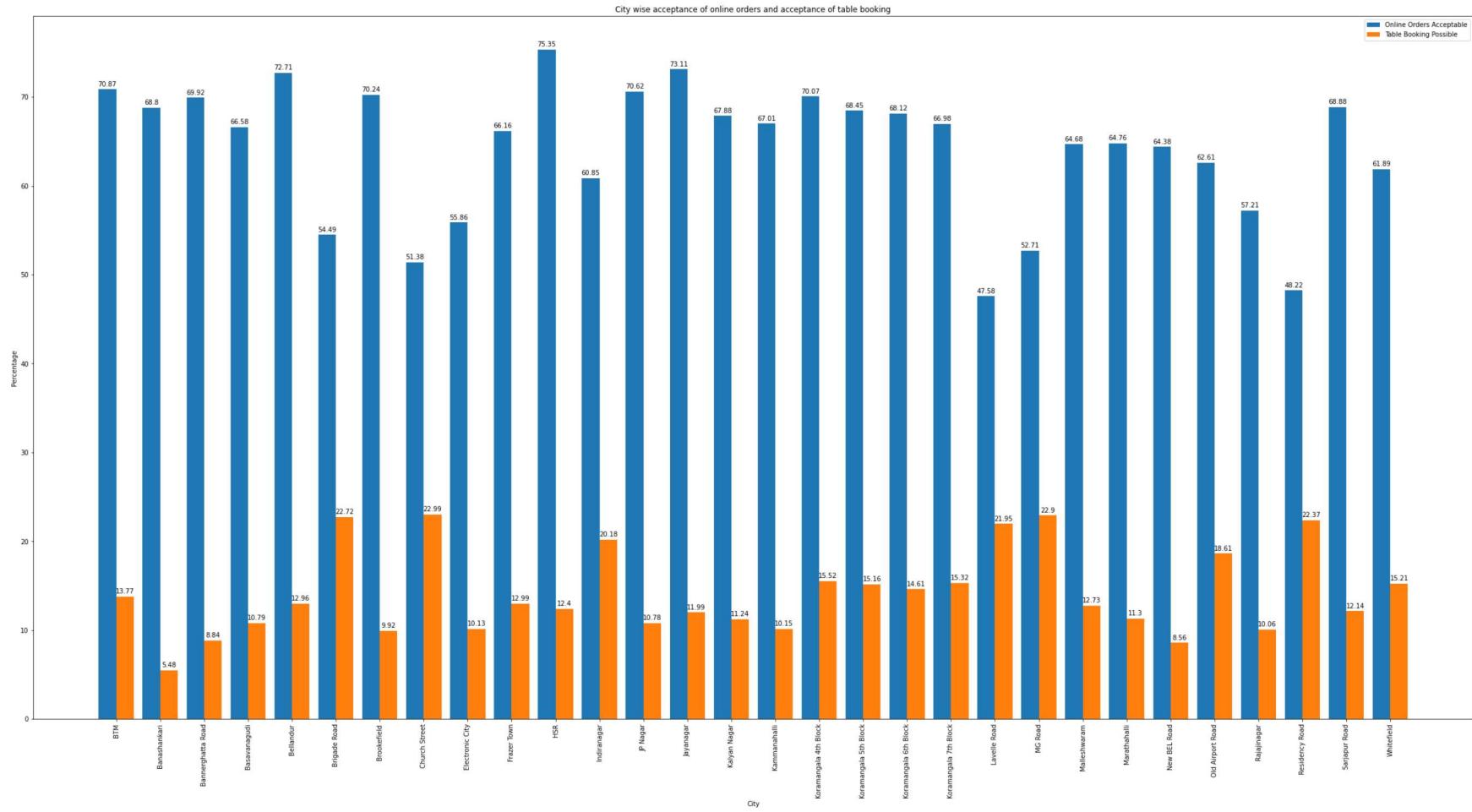
plt.rcParams["figure.figsize"] = [40,20]
fig,ax = plt.subplots()

online = ax.bar(length-width/2,y,width,label='Online Orders Acceptable',linewidth=20)
table = ax.bar(length+width/2,z,width,label='Table Booking Possible',linewidth=20)

ax.set_ylabel('Percentage')
ax.set_xlabel('City')
ax.set_title('City wise acceptance of online orders and acceptance of table booking')
ax.set_xticks(length,x)
plt.xticks(rotation=90)
ax.legend()

ax.bar_label(online,padding=3)
ax.bar_label(table,padding=3)

plt.show()
```



- Best location based on rating and votes

```
In [40]: columns2 = ['location','votes','rating']
bestloc = zomato[columns2]
bestloc = bestloc.groupby('location').agg({'votes':'sum','rating':'mean'})
bestloc.reset_index(inplace=True)
```

```
In [41]: x = bestloc['location']
y = bestloc['votes']
z = bestloc['rating']

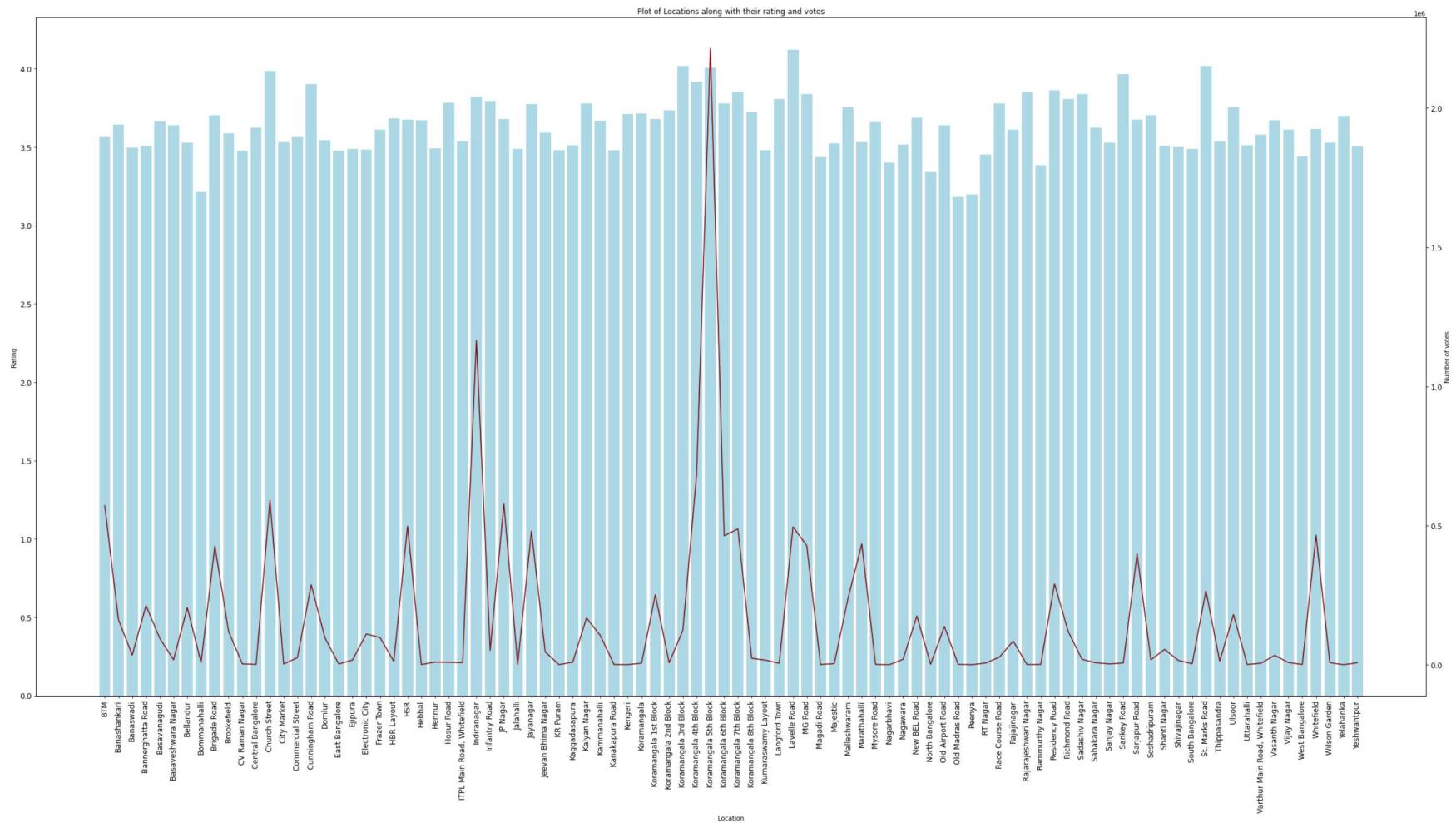
plt.rcParams["figure.figsize"] = [40,20]
fig,ax1 = plt.subplots()
ax1.bar(x,z,color="#ADD8E6")
```

```

ax1.set_xlabel('Location', loc='center')
ax1.set_ylabel('Rating', loc='center')
ax1.set_title('Plot of Locations along with their rating and votes')
ax1.tick_params(labelsize=12)
plt.xticks(rotation=90)
ax2=ax1.twinx()
ax2.plot(x,y,color="#800000")
ax2.set_ylabel('Number of votes', loc='center')
ax2.tick_params(labelsize=12)

plt.show()

```

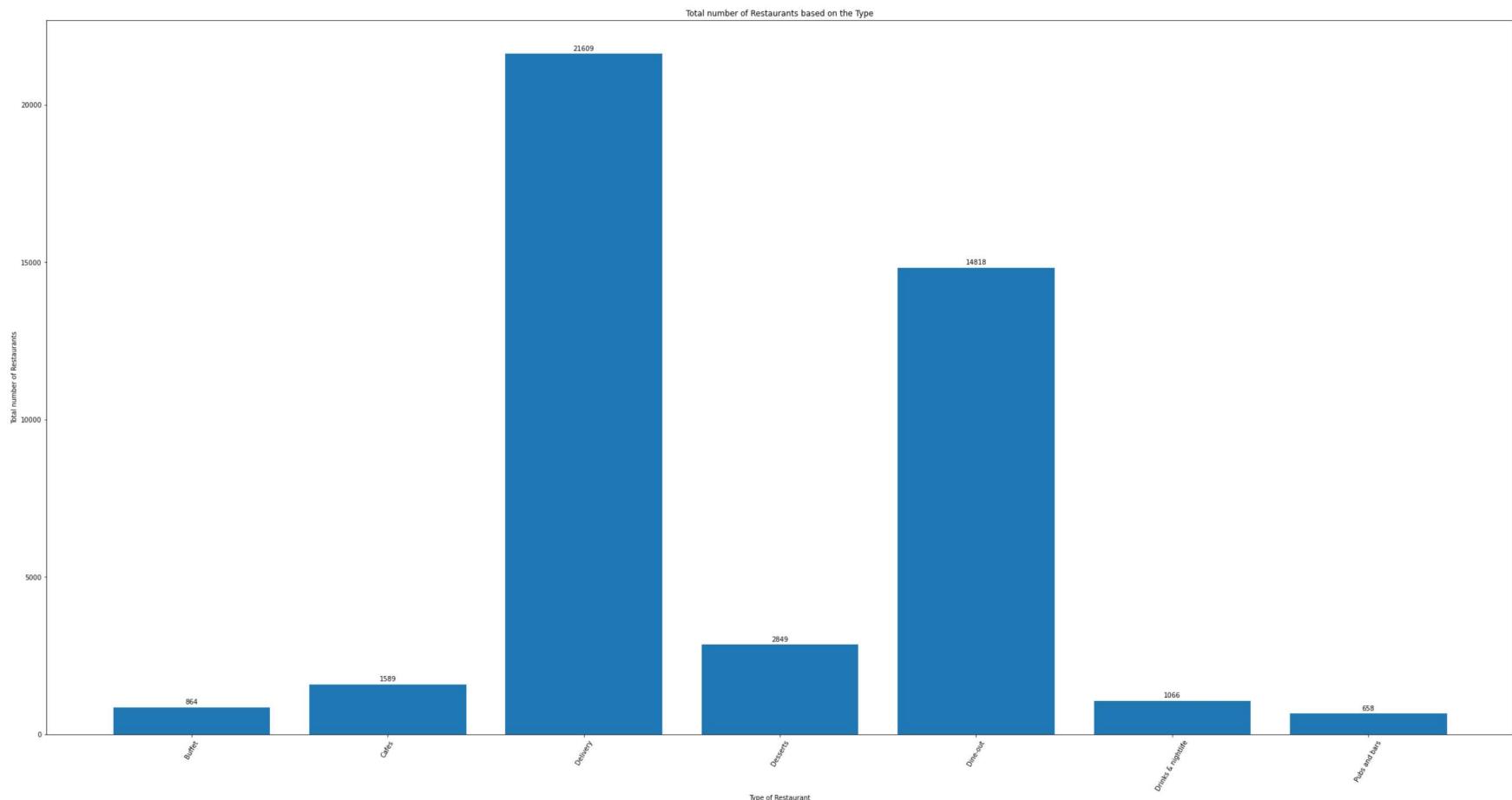


- Type of restaurants and their counts

```
In [42]: column3 = ['type']
typeofres = zomato[column3]
typeofres = typeofres.groupby('type').value_counts().to_frame(name='total_restaurants')
typeofres.reset_index(inplace=True)
```

```
In [43]: x = typeofres['type']
y = typeofres['total_restaurants']

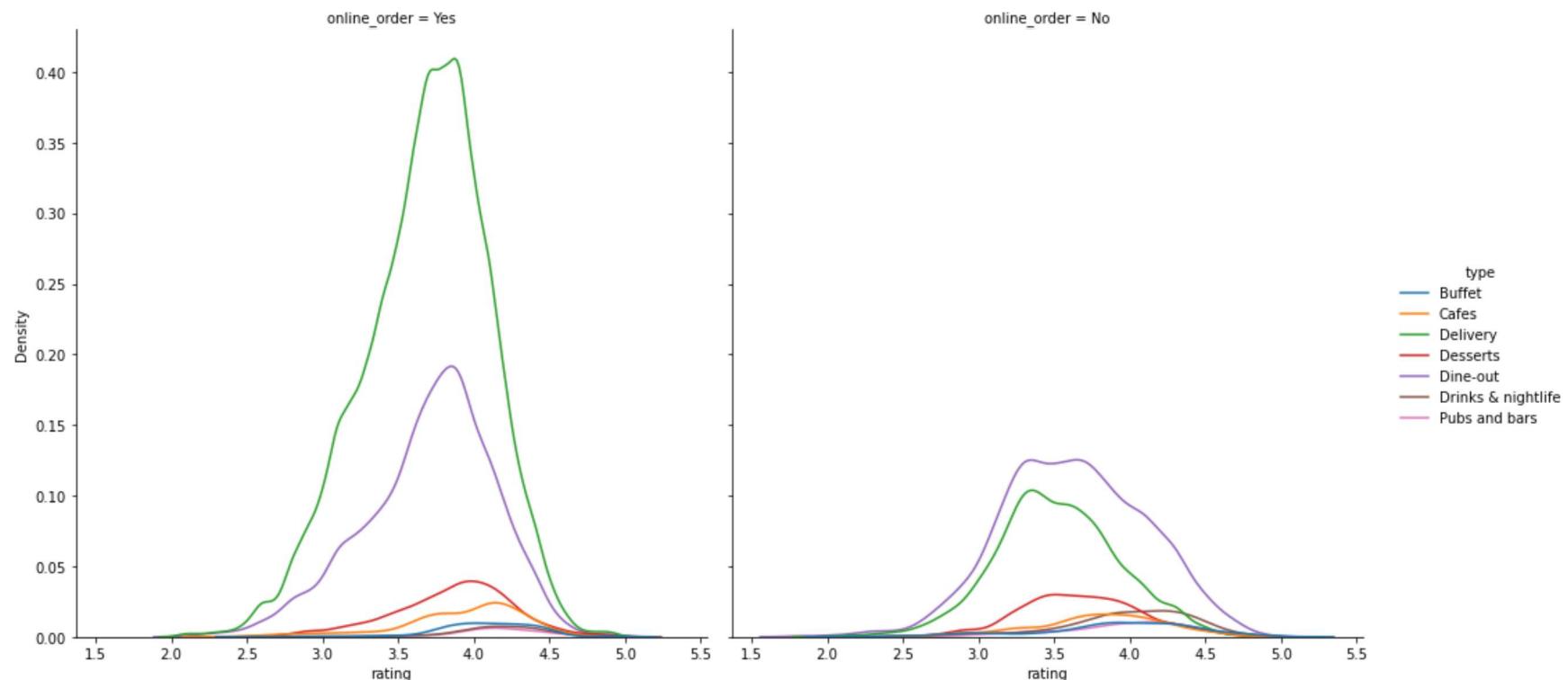
fig,ax = plt.subplots()
plt.rcParams["figure.figsize"]=[9,6]
aa = ax.bar(x,y)
ax.set_xlabel('Type of Restaurant')
ax.set_ylabel('Total number of Restaurants')
ax.set_title('Total number of Restaurants based on the Type')
ax.bar_label(aa,padding=3)
plt.xticks(rotation=60)
plt.show()
```



- Gaussian / Normal Distribution of Rating

```
In [44]: sns.displot(data=zomato,x='rating',kind='kde',hue='type',col='online_order',height=7)
```

```
Out[44]: <seaborn.axisgrid.FacetGrid at 0x180d9344c70>
```



- Restaurant chains and their total restaurants

```
In [45]: column3 = ['restaurant']
chains = zomato[column3]
chains = chains.groupby('restaurant').value_counts().to_frame(name='number_of_outlets')
chains.reset_index(inplace=True)
```

```
In [46]: chain = chains.sort_values(by='number_of_outlets',ascending=False).head(20)
```

```
In [47]: x = chain['restaurant']
y = chain['number_of_outlets']

plt.figure(figsize=(12,8))
aaaa = sns.barplot(y=x,x=y,orient='h')
```

```
plt.title('Famous Restaurant Chain having maximum number outlets')
plt.show()
```

