Zomato - Exploratory Data Analysis

The primary objective of this exploratory data analysis project is to gain insights into the Zomato dataset, specifically focusing on understanding the factors influencing the aggregate rating of restaurants, the distribution and characteristics of different types of restaurants across various locations in Bengaluru. We aim to provide a comprehensive overview of the restaurant industry in Bengaluru. By investigating this dataset, we seek to identify trends and patterns that can help both new and established restaurants in the city better understand the competitive landscape and make informed business decisions to thrive in this dynamic market.

Reading the dataset

In [1]:

```python
# Importing all the necessary libraries in the jupyter notebook
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:

```python
# Reading the CSV file
df = pd.read_csv('zomato.csv')
```

In [3]:

```
# Exploring the data
df.head()
```

Out[3]:

	url	address	name	online_order	book_tabl
0	https://www.zomato.com/bangalore/jalsa-banasha...	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	Yes	Ye
1	https://www.zomato.com/bangalore/spice-elephan...	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	Yes	N
2	https://www.zomato.com/SanchurroBangalore?cont...	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	Yes	N
3	https://www.zomato.com/bangalore/addhuri-udupi...	1st Floor, Annakuteera, 3rd Stage, Banashankar...	Addhuri Udupi Bhojana	No	N
4	https://www.zomato.com/bangalore/grand-village...	10, 3rd Floor, Lakshmi Associates, Gandhi Baza...	Grand Village	No	N

In [4]:

```
# Counting rows and column in the data
df.shape
```

Out[4]:

```
(51717, 17)
```

In [5]:

```
# Retriving all the columns in the dataset
df.columns
```

Out[5]:

```
Index(['url', 'address', 'name', 'online_order', 'book_table', 'rate', 'vo
tes',
       'phone', 'location', 'rest_type', 'dish_liked', 'cuisines',
       'approx_cost(for two people)', 'reviews_list', 'menu_item',
       'listed_in(type)', 'listed_in(city)'],
      dtype='object')
```

Data Cleaning

In [6]:

```
# Dropping unnecessary columns
df = df.drop(['url','address','phone','dish_liked', 'reviews_list','men
```

In [7]:
```
df.head()
```

Out[7]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	appro tv
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	South Indian, North Indian	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	

In [8]:
```
# Information about the dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51717 entries, 0 to 51716
Data columns (total 11 columns):
 #   Column                       Non-Null Count  Dtype 
---  ------                       --------------  ----- 
 0   name                         51717 non-null  object
 1   online_order                 51717 non-null  object
 2   book_table                   51717 non-null  object
 3   rate                         43942 non-null  object
 4   votes                        51717 non-null  int64 
 5   location                     51696 non-null  object
 6   rest_type                    51490 non-null  object
 7   cuisines                     51672 non-null  object
 8   approx_cost(for two people)  51371 non-null  object
 9   listed_in(type)              51717 non-null  object
 10  listed_in(city)              51717 non-null  object
dtypes: int64(1), object(10)
memory usage: 4.3+ MB
```

In [9]:
```
# Dropping duplicate values
df.drop_duplicates(inplace=True)
```

In [10]:
```
df.shape
```

Out[10]:
```
(51609, 11)
```

Cleaning 'rate' column

In [11]:
```
df['rate'].unique()
```

Out[11]:
```
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', nan, '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 [12]:
```
# Removing 'NEW', '-' and '/5' from rate column
def handlerate(value):
    if (value == 'NEW' or value == '-'):
        return np.nan
    else:
        value = str(value).split('/')
        value = value [0]
        return float (value)

df['rate'] = df['rate'].apply(handlerate)
```

In [13]:
```
df['rate'].head()
```

Out[13]:
```
0    4.1
1    4.1
2    3.8
3    3.7
4    3.8
Name: rate, dtype: float64
```

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

Out[14]:
```
10019
```

In [15]:
```
# Filling null values in rate column with mean
df.rate.fillna(df.rate.mean(), inplace= True)
```

In [16]:
```
df.rate.isnull().sum()
```

Out[16]:
```
0
```

In [17]:

```
# Checking missing values in the dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 51609 entries, 0 to 51716
Data columns (total 11 columns):
 #   Column                       Non-Null Count  Dtype  
---  ------                       --------------  -----  
 0   name                         51609 non-null  object 
 1   online_order                 51609 non-null  object 
 2   book_table                   51609 non-null  object 
 3   rate                         51609 non-null  float64
 4   votes                        51609 non-null  int64  
 5   location                     51588 non-null  object 
 6   rest_type                    51382 non-null  object 
 7   cuisines                     51564 non-null  object 
 8   approx_cost(for two people)  51265 non-null  object 
 9   listed_in(type)              51609 non-null  object 
 10  listed_in(city)              51609 non-null  object 
dtypes: float64(1), int64(1), object(9)
memory usage: 4.7+ MB
```

Dropping null values

In [18]:

```
df.dropna(inplace=True)
```

In [19]:

```
df.isnull().sum()
```

Out[19]:

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

In [20]:

```
# Exploring the dataset after treating with null and missing values
df.head()
```

Out[20]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	approx tw
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	

Renaming columns

In [21]:

```
df.rename(columns= {'approx_cost(for two people)': 'Cost_for_2', 'liste
df.head()
```

Out[21]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	Cost_f
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	

Dropping 'listed_in(city)' column

In [22]:

```
# Checking unique values in location column
df['location'].unique()
```

Out[22]:

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

In [23]:

```
# Checking unique values in listed_in(city) column
df['listed_in(city)'].unique()
```

Out[23]:

```
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)
```

In [24]:

```python
# Dropping 'listed_in(city)' column
df = df.drop(['listed_in(city)'], axis= 1)
df.head()
```

Out[24]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	Cost_f
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	

Cleaning 'Cost_for_2' column

In [25]:

```python
df['Cost_for_2'].unique()
```

Out[25]:

```
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', '50', '190', '1,700', '1,400', '180',
       '1,350', '2,200', '2,000', '1,800', '1,900', '330', '2,500',
       '2,100', '3,000', '2,800', '3,400', '40', '1,250', '3,500',
       '4,000', '2,400', '2,600', '120', '1,450', '469', '70', '3,200',
       '60', '560', '240', '360', '6,000', '1,050', '2,300', '4,100',
       '5,000', '3,700', '1,650', '2,700', '4,500', '140'], dtype=object)
```

In [26]:

```python
# Removing ',' from 'Cost_for_2' column
def handlecost(value):
    value = str(value)
    if ',' in value:
        value = value.replace(',','')
        return int(value)
    else:
        return int(value)

df['Cost_for_2'] = df['Cost_for_2'].apply(handlecost)
```

In [27]:
```
df['Cost_for_2'].unique()
```

Out[27]:
```
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,   50,  190, 1700, 1400,
        180, 1350, 2200, 2000, 1800, 1900,  330, 2500, 2100, 3000, 2800,
       3400,   40, 1250, 3500, 4000, 2400, 2600,  120, 1450,  469,   70,
       3200,   60,  560,  240,  360, 6000, 1050, 2300, 4100, 5000, 3700,
       1650, 2700, 4500,  140], dtype=int64)
```

In [28]:
```
df.head()
```

Out[28]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	Cost_f
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	North Indian, Mughlai, Chinese	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Chinese, North Indian, Thai	
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Cafe, Mexican, Italian	
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	North Indian, Rajasthani	

Cleaning 'rest_type' column

In [29]:
```
df['rest_type'].value_counts()
```

Out[29]:
```
rest_type
Quick Bites                  19010
Casual Dining                10253
Cafe                          3682
Delivery                      2574
Dessert Parlor                2242
                             ...  
Dessert Parlor, Kiosk            2
Food Court, Beverage Shop        2
Dessert Parlor, Food Court       2
Quick Bites, Kiosk               1
Sweet Shop, Dessert Parlor       1
Name: count, Length: 93, dtype: int64
```

In [30]:

```
# Creating new variable which holds list of all the rest_type
rest_types = df['rest_type'].value_counts(ascending= True)
rest_types
```

Out[30]:

```
rest_type
Quick Bites, Kiosk              1
Sweet Shop, Dessert Parlor      1
Dessert Parlor, Food Court      2
Food Court, Beverage Shop       2
Cafe, Food Court                2
                             ...
Dessert Parlor               2242
Delivery                     2574
Cafe                         3682
Casual Dining               10253
Quick Bites                 19010
Name: count, Length: 93, dtype: int64
```

In [31]:

```
# Creating new variable to store all the rest type under 1000
rest_type_under_1000 = rest_types [rest_types < 1000]
rest_type_under_1000
```

Out[31]:

```
rest_type
Quick Bites, Kiosk            1
Sweet Shop, Dessert Parlor    1
Dessert Parlor, Food Court    2
Food Court, Beverage Shop     2
Cafe, Food Court              2
                           ...
Bar, Casual Dining          411
Sweet Shop                  468
Food Court                  616
Bar                         686
Beverage Shop               863
Name: count, Length: 85, dtype: int64
```

In [32]:

```
# Making rest type under 1000 in frequency as 'others'
def handle_rest_type(value):
    if value in rest_type_under_1000:
        return 'others'
    else:
        return value

df['rest_type'] = df['rest_type'].apply(handle_rest_type)
```

In [33]:

```
df['rest_type'].value_counts()
```

Out[33]:

```
rest_type
Quick Bites           19010
Casual Dining         10253
others                 9003
Cafe                   3682
Delivery               2574
Dessert Parlor         2242
Takeaway, Delivery     2008
Bakery                 1140
Casual Dining, Bar     1130
Name: count, dtype: int64
```

Cleaning 'location' column

In [34]:

```
df['location'].value_counts()
```

Out[34]:

```
location
BTM                      5056
HSR                      2494
Koramangala 5th Block    2479
JP Nagar                 2218
Whitefield               2105
                         ... 
West Bangalore              6
Yelahanka                   5
Jakkur                      3
Rajarajeshwari Nagar        2
Peenya                      1
Name: count, Length: 93, dtype: int64
```

In [35]:

```
# Creating new variable which holds list of all the locations
locations = df['location'].value_counts(ascending=True)
locations
```

Out[35]:

```
location
Peenya                      1
Rajarajeshwari Nagar        2
Jakkur                      3
Yelahanka                   5
West Bangalore              6
                         ... 
Whitefield               2105
JP Nagar                 2218
Koramangala 5th Block    2479
HSR                      2494
BTM                      5056
Name: count, Length: 93, dtype: int64
```

In [36]:

```
# Creating new variable to store all the locations under 500 restaurant
locations_under_500 = locations [locations < 500]
locations_under_500
```

Out[36]:

```
location
Peenya                             1
Rajarajeshwari Nagar               2
Jakkur                             3
Yelahanka                          5
West Bangalore                     6
Central Bangalore                  8
Kengeri                            8
Nagarbhavi                         9
Hebbal                            14
North Bangalore                   14
Uttarahalli                       17
KR Puram                          18
Kanakapura Road                   19
Old Madras Road                   22
Mysore Road                       22
Sankey Road                       27
Langford Town                     27
Rammurthy Nagar                   32
Magadi Road                       34
Jalahalli                         38
East Bangalore                    43
Koramangala                       48
Sahakara Nagar                    53
Sadashiv Nagar                    63
Sanjay Nagar                      76
Vijay Nagar                       78
RT Nagar                          78
CV Raman Nagar                    89
Hosur Road                        98
Kaggadasapura                    101
Koramangala 2nd Block            102
South Bangalore                  107
Varthur Main Road, Whitefield    109
ITPL Main Road, Whitefield       113
Yeshwantpur                      119
City Market                      122
Race Course Road                 139
Infantry Road                    150
HBR Layout                       153
Majestic                         155
Hennur                           159
Seshadripuram                    165
Nagawara                         187
Basaveshwara Nagar               187
Thippasandra                     191
Kumaraswamy Layout               191
Koramangala 3rd Block            215
Bommanahalli                     236
Wilson Garden                    246
Jeevan Bhima Nagar               268
Vasanth Nagar                    293
Koramangala 8th Block            294
St. Marks Road                   343
Commercial Street                370
Ejipura                          433
Old Airport Road                 437
Domlur                           482
Cunningham Road                  490
```

```
Shivajinagar                     498
Name: count, dtype: int64
```

In [37]:

```python
# Making locations under 500 in frequency as 'others'
def handlelocations(value):
    if value in locations_under_500:
        return 'others'
    else:
        return value

df['location'] = df['location'].apply(handlelocations)
```

In [38]:

```python
df['location'].value_counts()
```

Out[38]:

```
location
others                   8007
BTM                      5056
HSR                      2494
Koramangala 5th Block    2479
JP Nagar                 2218
Whitefield               2105
Indiranagar              2026
Jayanagar                1916
Marathahalli             1805
Bannerghatta Road        1609
Bellandur                1268
Electronic City          1246
Koramangala 1st Block    1236
Brigade Road             1210
Koramangala 7th Block    1174
Koramangala 6th Block    1127
Sarjapur Road            1047
Koramangala 4th Block    1017
Ulsoor                   1011
Banashankari              902
MG Road                   893
Kalyan Nagar              841
Richmond Road             803
Malleshwaram              721
Frazer Town               714
Basavanagudi              684
Residency Road            671
Brookefield               656
New BEL Road              644
Banaswadi                 640
Kammanahalli              639
Rajajinagar               591
Church Street             566
Lavelle Road              518
Shanti Nagar              508
Name: count, dtype: int64
```

Cleaning 'cuisines' column

In [39]:

```
df['cuisines'].value_counts()
```

Out[39]:

```
cuisines
North Indian                                2852
North Indian, Chinese                       2351
South Indian                                1820
Biryani                                      903
Bakery, Desserts                             898
                                            ... 
North Indian, Chinese, Oriya, Mithai           1
Beverages, Burger                              1
North Indian, Mughlai, Lucknowi                1
Continental, Thai, North Indian, Chinese       1
North Indian, Chinese, Arabian, Momos          1
Name: count, Length: 2704, dtype: int64
```

In [40]:

```
# Creating new variable which holds list of all the cuisines
cuisine = df['cuisines'].value_counts(ascending=True)
cuisine
```

Out[40]:

```
cuisines
North Indian, Chinese, Arabian, Momos                1
Kerala, Biryani, Seafood, North Indian               1
Street Food, Mithai, North Indian                    1
Fast Food, Street Food, North Indian, Biryani        1
Chinese, North Indian, Andhra, South Indian          1
                                                  ... 
Bakery, Desserts                                   898
Biryani                                            903
South Indian                                      1820
North Indian, Chinese                             2351
North Indian                                      2852
Name: count, Length: 2704, dtype: int64
```

In [41]:

```
# Creating new variable to store all the cuisines under 200
cuisines_under_200 = cuisine [cuisine < 200]
cuisines_under_200
```

Out[41]:

```
cuisines
North Indian, Chinese, Arabian, Momos                  1
Kerala, Biryani, Seafood, North Indian                 1
Street Food, Mithai, North Indian                      1
Fast Food, Street Food, North Indian, Biryani          1
Chinese, North Indian, Andhra, South Indian            1
                                                    ... 
Fast Food, Rolls                                     172
South Indian, North Indian, Chinese, Street Food     186
North Indian, Mughlai                                187
Continental                                          195
Bakery, Fast Food                                    199
Name: count, Length: 2667, dtype: int64
```

In [42]:

```
# Making cuisines under 200 in frequency as 'others'
def handlelcuisines(value):
    if value in cuisines_under_200:
        return 'others'
    else:
        return value

df['cuisines'] = df['cuisines'].apply(handlelcuisines)
```

In [43]:

```
df['cuisines'].value_counts()
```

Out[43]:

```
cuisines
others                                 30795
North Indian                            2852
North Indian, Chinese                   2351
South Indian                            1820
Biryani                                  903
Bakery, Desserts                         898
Fast Food                                796
Desserts                                 754
Cafe                                     725
South Indian, North Indian, Chinese      724
Bakery                                   649
Chinese                                  552
Ice Cream, Desserts                      415
Chinese, North Indian                    405
Mithai, Street Food                      363
Desserts, Ice Cream                      349
North Indian, Chinese, Biryani           345
South Indian, North Indian               337
North Indian, South Indian               329
North Indian, South Indian, Chinese      305
Beverages                                284
North Indian, Biryani                    283
Biryani, Kebab                           277
Biryani, North Indian                    264
Desserts, Beverages                      261
Finger Food                              258
Street Food                              255
South Indian, Chinese                    254
South Indian, Biryani                    246
Beverages, Fast Food                     245
Chinese, Momos                           238
North Indian, Fast Food                  237
Cafe, Fast Food                          230
Fast Food, Beverages                     218
Ice Cream                                213
Kerala                                   208
Desserts, Bakery                         203
North Indian, Chinese, South Indian      201
Name: count, dtype: int64
```

Data Visualization

In [44]:

```
df.head()
```

Out[44]:

	name	online_order	book_table	rate	votes	location	rest_type	cuisines	Cost_fo
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	others	8
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	others	8
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	others	others	8
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	South Indian, North Indian	3
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	others	6

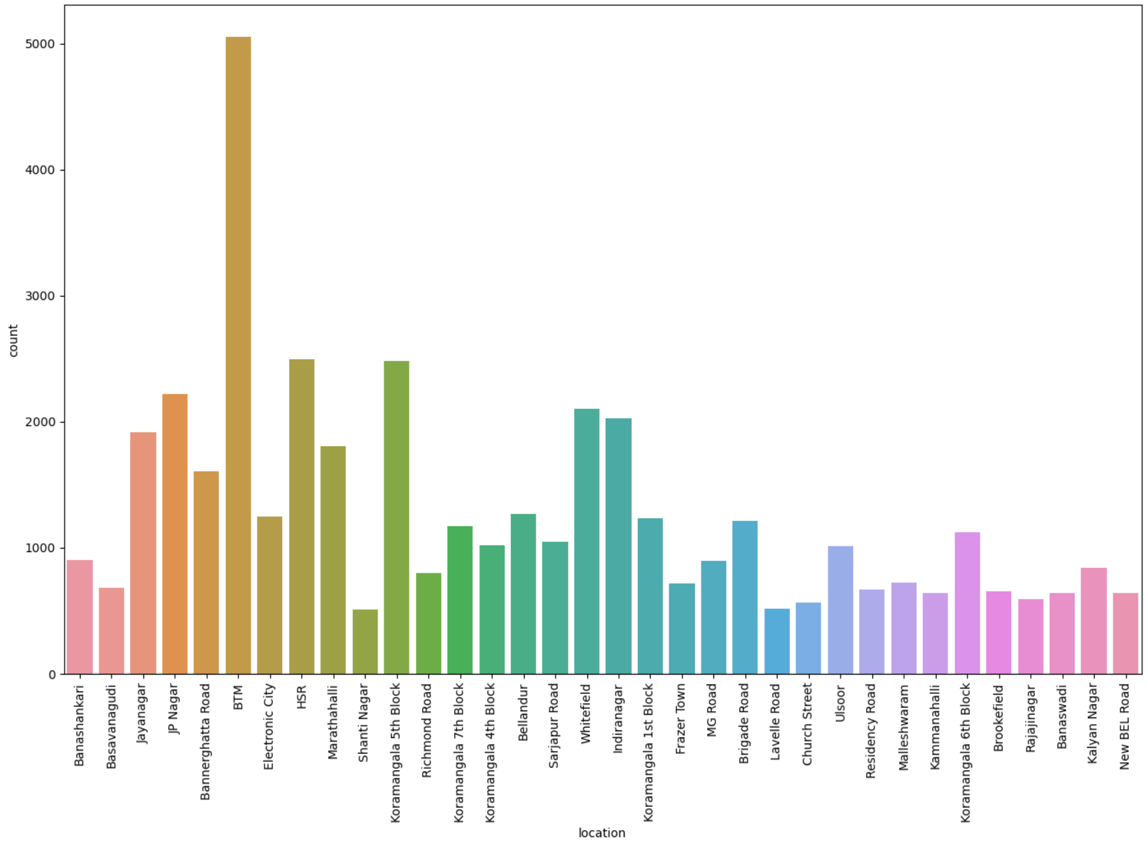
Countplot for various locations

In [45]:

```
# Excluding 'others' from location column as it doesn't add value to th
plt.figure(figsize= (16,10))
sns.countplot(x='location', data=df[-(df.location=='others')])
plt.xticks(rotation = 90)
```

Out[45]:

```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 1
6,
        17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 3
3]),
 [Text(0, 0, 'Banashankari'),
  Text(1, 0, 'Basavanagudi'),
  Text(2, 0, 'Jayanagar'),
  Text(3, 0, 'JP Nagar'),
  Text(4, 0, 'Bannerghatta Road'),
  Text(5, 0, 'BTM'),
  Text(6, 0, 'Electronic City'),
  Text(7, 0, 'HSR'),
  Text(8, 0, 'Marathahalli'),
  Text(9, 0, 'Shanti Nagar'),
  Text(10, 0, 'Koramangala 5th Block'),
  Text(11, 0, 'Richmond Road'),
  Text(12, 0, 'Koramangala 7th Block'),
  Text(13, 0, 'Koramangala 4th Block'),
  Text(14, 0, 'Bellandur'),
  Text(15, 0, 'Sarjapur Road'),
  Text(16, 0, 'Whitefield'),
  Text(17, 0, 'Indiranagar'),
  Text(18, 0, 'Koramangala 1st Block'),
  Text(19, 0, 'Frazer Town'),
  Text(20, 0, 'MG Road'),
  Text(21, 0, 'Brigade Road'),
  Text(22, 0, 'Lavelle Road'),
  Text(23, 0, 'Church Street'),
  Text(24, 0, 'Ulsoor'),
  Text(25, 0, 'Residency Road'),
  Text(26, 0, 'Malleshwaram'),
  Text(27, 0, 'Kammanahalli'),
  Text(28, 0, 'Koramangala 6th Block'),
  Text(29, 0, 'Brookefield'),
  Text(30, 0, 'Rajajinagar'),
  Text(31, 0, 'Banaswadi'),
  Text(32, 0, 'Kalyan Nagar'),
  Text(33, 0, 'New BEL Road')])
```



From the above countplot, we can infer that BTM locality has the most number of restaurants in the bangalore city followed by HSR and Koramangala 5th Block. So, if a entrepreneur were to open a new restaurant in one of these place then he/she may face tough competition.

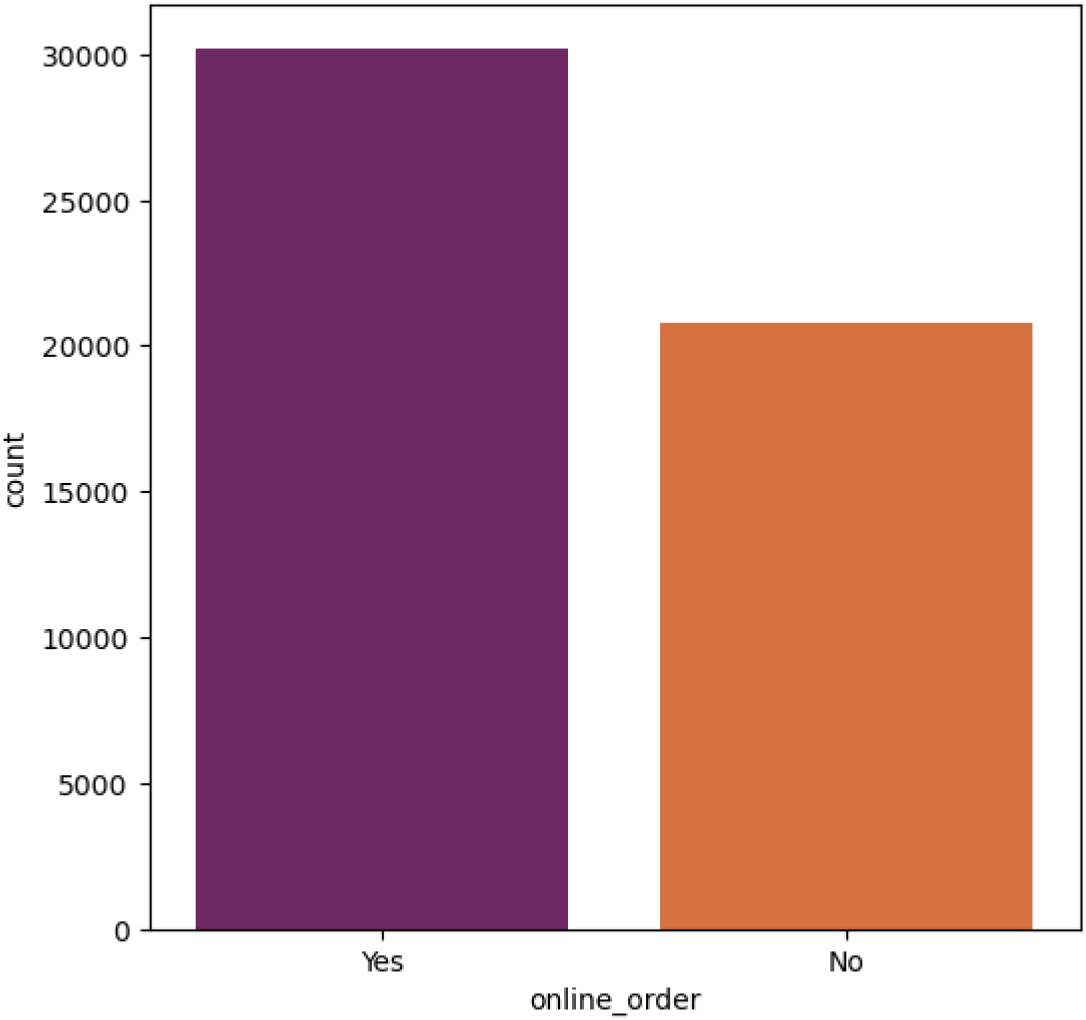
Visualizing online order

In [46]:

```
plt.figure(figsize=(6,6))
sns.countplot(data=df, x='online_order', palette='inferno')
```

Out[46]:

```
<Axes: xlabel='online_order', ylabel='count'>
```

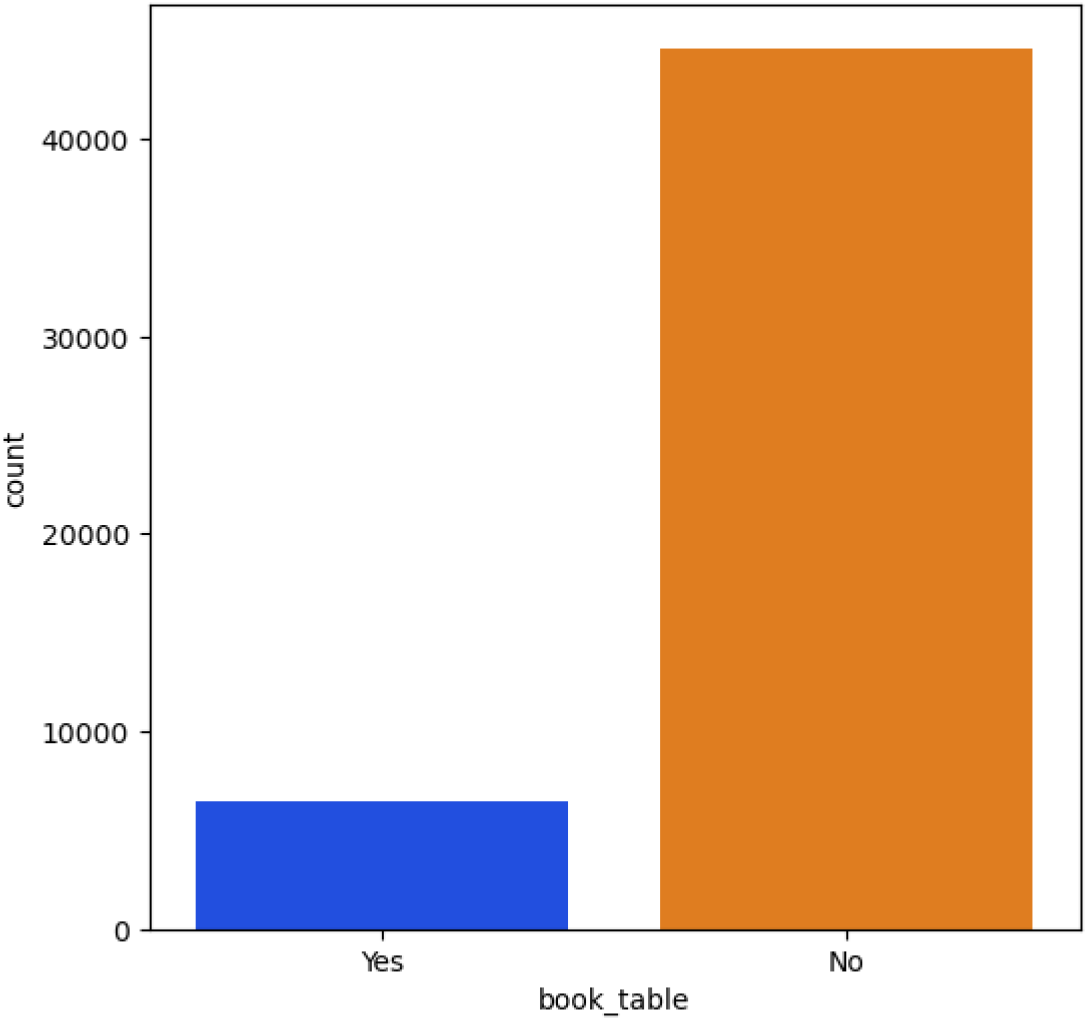


Significant number of restaurants provide online order facility in Bangalore. Work culture is rapidly changing in metro cities and ordering food online is looked at as a convinient option. So, an entreprenuer should provide online order facility in new restaurant and an existing restaurant owner should start online order facility.

Visualizing booking

```
In [47]: plt.figure(figsize=(6,6))
         sns.countplot(x=df['book_table'], palette='bright' )
```

```
Out[47]: <Axes: xlabel='book_table', ylabel='count'>
```



Most of the restaurants does not provide table booking facility.

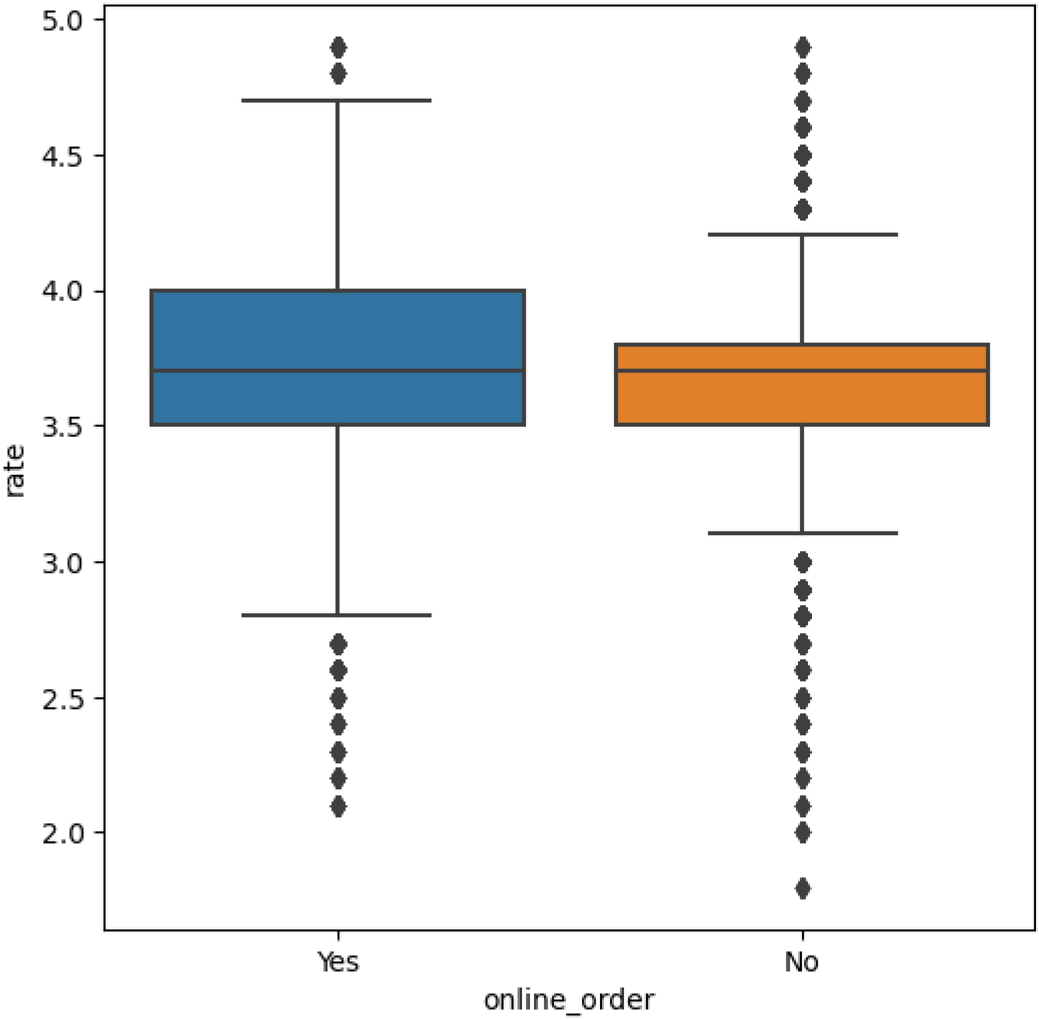
Visualizing online order vs rate

In [48]:

```
plt.figure(figsize=(6,6))
sns.boxplot(x='online_order', y='rate', data=df)
```

Out[48]:

```
<Axes: xlabel='online_order', ylabel='rate'>
```

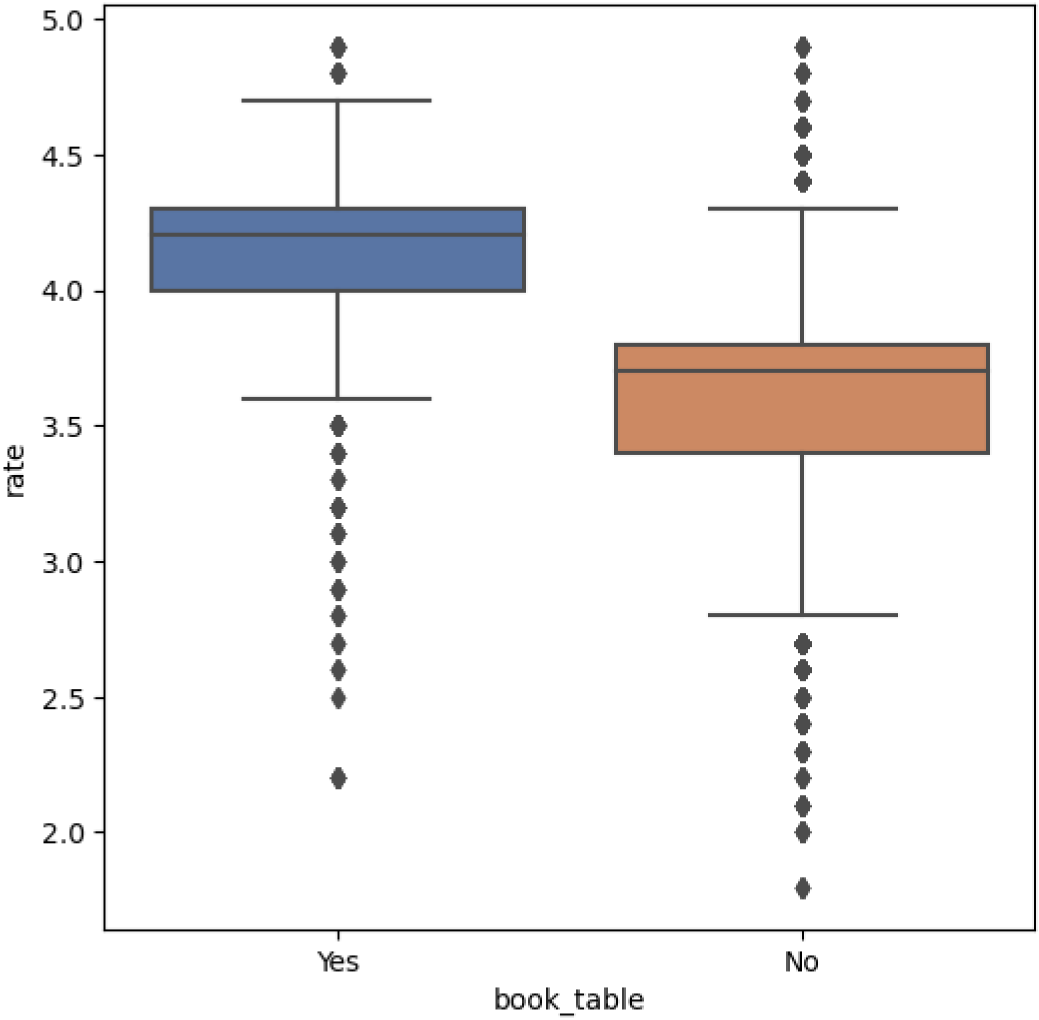


Both restaurants offering online order facility and who does not offer online order facility have median rating of approx 3.7 out of 5. However, restaurants offering online order facility have highest rating i.e. 4.7 out 5 as compared to the other who has 4.2 out of 5.

Visualizing booking vs rate

In [49]:
```
plt.figure(figsize=(6,6))
sns.boxplot(x='book_table', y='rate', data=df, palette= 'deep')
```

Out[49]:
```
<Axes: xlabel='book_table', ylabel='rate'>
```



Here we can see considerable difference between median ratings of restaurants offering table booking facility and restaurants not offering this facility. Table booking facility allows customer to avoid queues or frustration of unavailability which results in customer delight and eventually higher ratings.

Visualizing location wise online order facility

In [50]:
```
df1 = df.groupby(['location','online_order'])['name'].count()
```

In [51]:
```
df1.to_csv('location_online.csv')
```

In [52]:
```
df1 = pd.read_csv('location_online.csv')
```

In [53]:

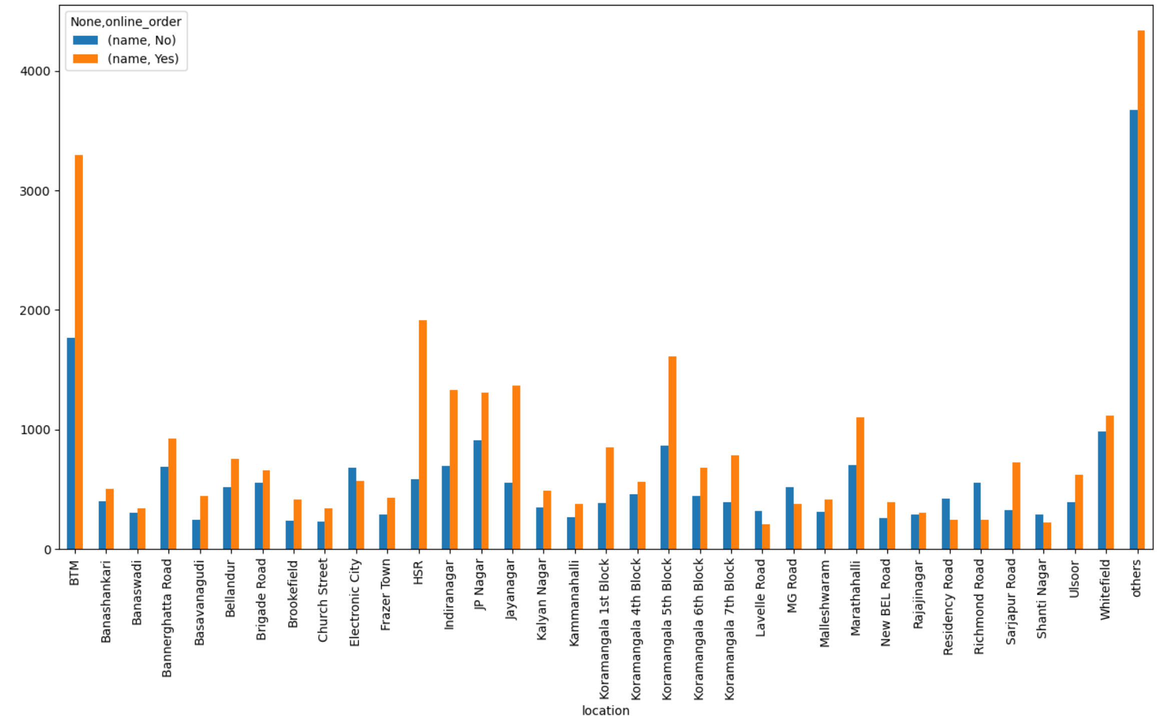
```
df1 = pd.pivot_table(df1, values=None, index=['location'], columns=['on
df1
```

Out[53]:

	name	
online_order	**No**	**Yes**
location		
BTM	1763	3293
Banashankari	397	505
Banaswadi	302	338
Bannerghatta Road	685	924
Basavanagudi	243	441
Bellandur	517	751
Brigade Road	552	658
Brookefield	239	417
Church Street	226	340
Electronic City	676	570
Frazer Town	287	427
HSR	584	1910
Indiranagar	697	1329
JP Nagar	911	1307
Jayanagar	552	1364
Kalyan Nagar	350	491
Kammanahalli	264	375
Koramangala 1st Block	384	852
Koramangala 4th Block	459	558
Koramangala 5th Block	866	1613
Koramangala 6th Block	445	682
Koramangala 7th Block	389	785
Lavelle Road	315	203
MG Road	520	373
Malleshwaram	309	412
Marathahalli	701	1104
New BEL Road	255	389
Rajajinagar	286	305
Residency Road	424	247
Richmond Road	557	246
Sarjapur Road	323	724
Shanti Nagar	289	219
Ulsoor	389	622
Whitefield	986	1119
others	3672	4335

In [54]:
```
# visualizing online order facility wr.t location via bar plot
df1.plot(kind ='bar', figsize= (16,8))
```

Out[54]:
```
<Axes: xlabel='location'>
```



Above bargraph allows us to understand location wise number of restaurants offering online order facility.

Visualizing location wise booking facility

In [55]:
```
df2 = df.groupby(['location','book_table'])['name'].count()
```

In [56]:
```
df2.to_csv('location_booking.csv')
```

In [57]:
```
df2 = pd.read_csv('location_booking.csv')
```

In [58]:

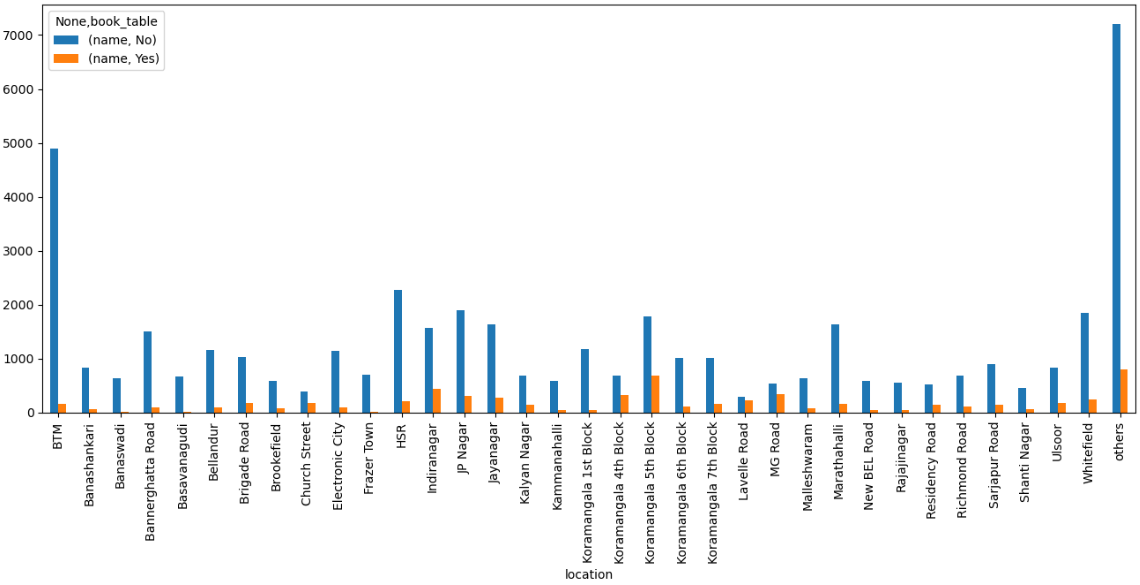
```
df2 = pd.pivot_table(df2, values=None, index=['location'], columns=['bo
df2
```

Out[58]:

	name	
book_table	No	Yes
location		
BTM	4889	167
Banashankari	839	63
Banaswadi	632	8
Bannerghatta Road	1510	99
Basavanagudi	668	16
Bellandur	1170	98
Brigade Road	1034	176
Brookefield	582	74
Church Street	385	181
Electronic City	1148	98
Frazer Town	706	8
HSR	2277	217
Indiranagar	1578	448
JP Nagar	1903	315
Jayanagar	1637	279
Kalyan Nagar	692	149
Kammanahalli	590	49
Koramangala 1st Block	1186	50
Koramangala 4th Block	695	322
Koramangala 5th Block	1787	692
Koramangala 6th Block	1015	112
Koramangala 7th Block	1012	162
Lavelle Road	290	228
MG Road	546	347
Malleshwaram	632	89
Marathahalli	1642	163
New BEL Road	588	56
Rajajinagar	550	41
Residency Road	522	149
Richmond Road	687	116
Sarjapur Road	893	154
Shanti Nagar	451	57
Ulsoor	834	177
Whitefield	1852	253
others	7204	803

```
In [59]:
# visualizing booking facility w.r.t location via bar plot
df2.plot(kind='bar', figsize=(16,6))
```

```
Out[59]: <Axes: xlabel='location'>
```

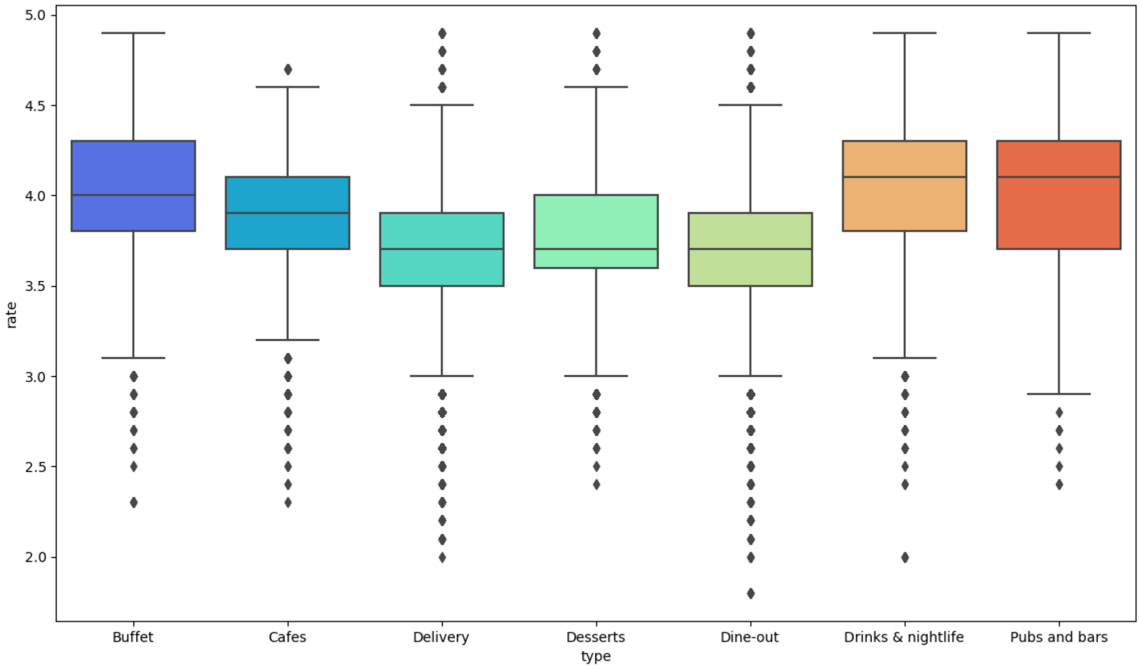


Above bargraph allows us to understand location wise number of restaurants offering table booking facility.

Visualizing types of restaurants w.r.t. ratings

```
In [83]:
plt.figure(figsize = (14,8))
sns.boxplot(x='type', y='rate',data=df, palette='rainbow')
```

```
Out[83]: <Axes: xlabel='type', ylabel='rate'>
```



From the above boxplot, we can conclude that 'Drinks and Nightlife' and 'Pubs and bars' types of restaurants have the highest median rating of 4.2 out of 5 and maximum rating of 4.9 out of along with 'Buffet' type of restaurant.

Visualizing location wise types of restaurants

In [61]:

```
df3 = df.groupby(['location','type'])['name'].count()
```

In [62]:

```
df3.to_csv('location_type.csv')
```

In [63]:

```
df3 = pd.read_csv('location_type.csv')
```

```
In [64]: df3 = pd.pivot_table(df3, values=None, index='location', columns='type'
         df3
```

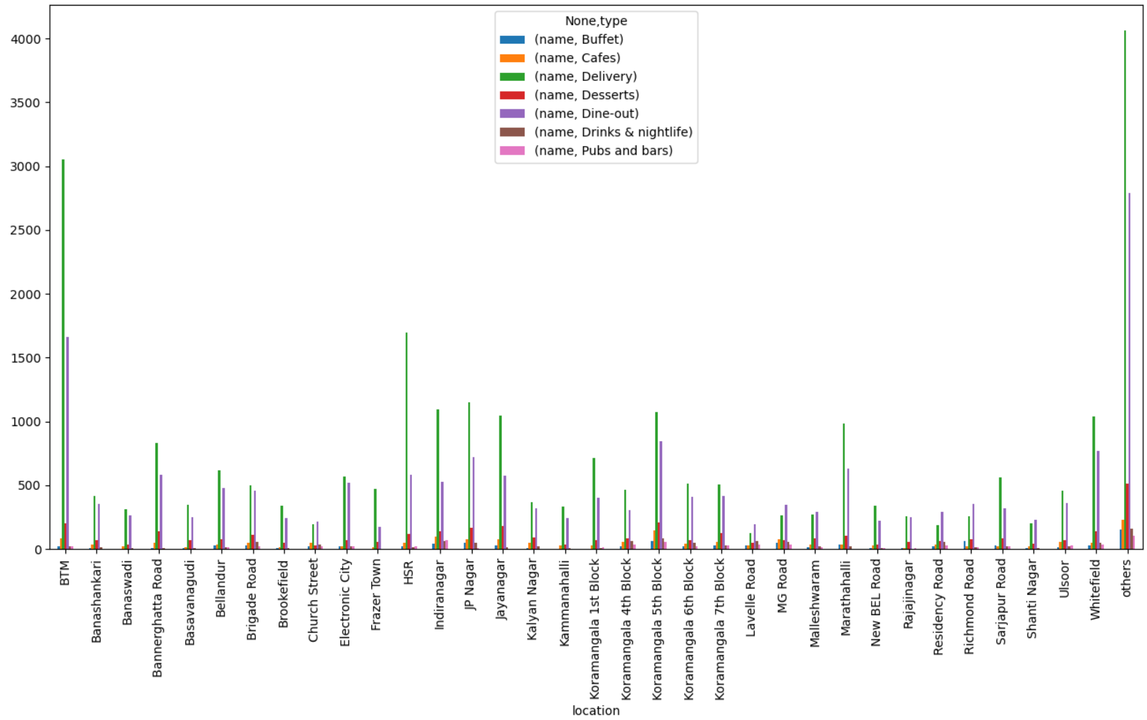
Out[64]:

	name						
type	Buffet	Cafes	Delivery	Desserts	Dine-out	Drinks & nightlife	Pubs and bars
location							
BTM	21.0	83.0	3053.0	198.0	1660.0	22.0	19.0
Banashankari	7.0	36.0	418.0	71.0	356.0	14.0	NaN
Banaswadi	NaN	24.0	310.0	37.0	262.0	6.0	1.0
Bannerghatta Road	9.0	46.0	828.0	137.0	578.0	9.0	2.0
Basavanagudi	7.0	11.0	344.0	66.0	251.0	5.0	NaN
Bellandur	28.0	36.0	617.0	75.0	479.0	17.0	16.0
Brigade Road	25.0	46.0	497.0	108.0	455.0	57.0	22.0
Brookefield	6.0	17.0	339.0	45.0	245.0	4.0	NaN
Church Street	19.0	51.0	193.0	29.0	215.0	36.0	23.0
Electronic City	23.0	24.0	570.0	71.0	516.0	21.0	21.0
Frazer Town	1.0	11.0	470.0	56.0	172.0	2.0	2.0
HSR	19.0	49.0	1694.0	120.0	580.0	14.0	18.0
Indiranagar	38.0	97.0	1091.0	140.0	529.0	65.0	66.0
JP Nagar	45.0	76.0	1151.0	166.0	722.0	51.0	7.0
Jayanagar	27.0	77.0	1043.0	182.0	575.0	12.0	NaN
Kalyan Nagar	9.0	45.0	366.0	88.0	315.0	18.0	NaN
Kammanahalli	2.0	27.0	329.0	35.0	240.0	6.0	NaN
Koramangala 1st Block	3.0	26.0	716.0	70.0	398.0	7.0	16.0
Koramangala 4th Block	21.0	53.0	464.0	81.0	302.0	62.0	34.0
Koramangala 5th Block	65.0	146.0	1075.0	209.0	842.0	84.0	58.0
Koramangala 6th Block	18.0	43.0	511.0	70.0	411.0	51.0	23.0
Koramangala 7th Block	25.0	52.0	503.0	127.0	417.0	25.0	25.0
Lavelle Road	30.0	27.0	127.0	50.0	191.0	59.0	34.0
MG Road	51.0	76.0	266.0	68.0	343.0	53.0	36.0
Malleshwaram	11.0	31.0	269.0	85.0	291.0	20.0	14.0
Marathahalli	34.0	32.0	980.0	105.0	630.0	22.0	2.0
New BEL Road	4.0	29.0	338.0	33.0	224.0	8.0	8.0
Rajajinagar	10.0	4.0	258.0	55.0	251.0	3.0	10.0
Residency Road	20.0	31.0	187.0	63.0	289.0	55.0	26.0
Richmond Road	63.0	21.0	257.0	78.0	356.0	16.0	12.0
Sarjapur Road	25.0	22.0	558.0	82.0	319.0	19.0	22.0
Shanti Nagar	9.0	22.0	198.0	39.0	229.0	9.0	2.0
Ulsoor	16.0	56.0	456.0	71.0	359.0	23.0	30.0

	name						
type	**Buffet**	**Cafes**	**Delivery**	**Desserts**	**Dine-out**	**Drinks & nightlife**	**Pubs and bars**
location							
Whitefield	28.0	51.0	1041.0	137.0	768.0	47.0	33.0
others	150.0	225.0	4062.0	512.0	2792.0	162.0	104.0

In [87]:
```
df3.plot(kind='bar',figsize=(16,8))
```

Out[87]:
```
<Axes: xlabel='location'>
```



Above bargraph allows us to understand location wise types of restaurants. We can conclude that most of the locations have highest 'delivery' restaurants amongst other types which shows strong order in culture in Banglore.

Visualizing location wise number of votes

In [89]:
```
df4 = df[['location','votes']]
```

In [90]:

```
df4.drop_duplicates()
```

Out[90]:

	location	votes
0	Banashankari	775
1	Banashankari	787
2	Banashankari	918
3	Banashankari	88
4	Basavanagudi	166
...	...	...
51328	Whitefield	152
51547	Whitefield	203
51606	others	848
51628	Bellandur	411
51677	Whitefield	81

9104 rows × 2 columns

In [91]:

```
df5 = df4.groupby(['location'])['votes'].sum()
```

In [92]:

```
df5 = df5.to_frame()
```

In [93]:

```
df5 = df5.sort_values('votes', ascending= False )
df5.head()
```

Out[93]:

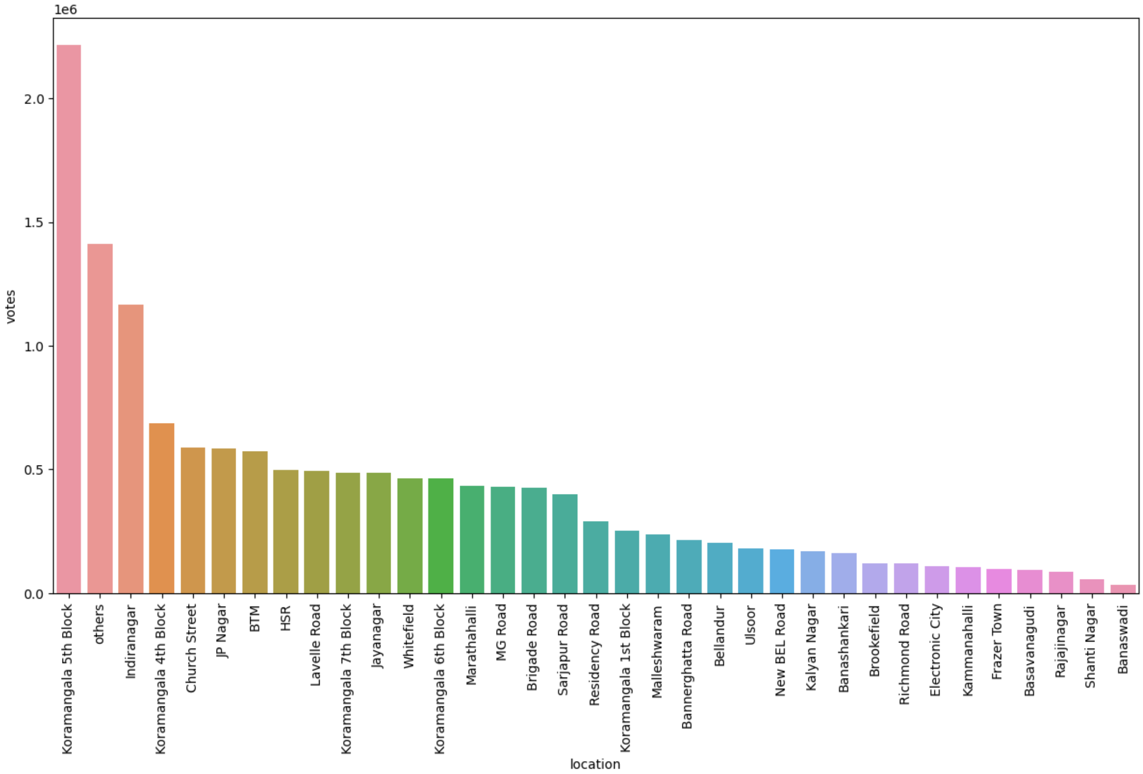
	votes
location	
Koramangala 5th Block	2214083
others	1410176
Indiranagar	1165909
Koramangala 4th Block	685156
Church Street	590306

In [97]:

```
plt.figure(figsize = (15,8))
sns.barplot(data=df5, x= df5.index, y='votes')
plt.xticks(rotation = 90)
```

Out[97]:

```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 1
6,
        17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 3
3,
        34]),
 [Text(0, 0, 'Koramangala 5th Block'),
  Text(1, 0, 'others'),
  Text(2, 0, 'Indiranagar'),
  Text(3, 0, 'Koramangala 4th Block'),
  Text(4, 0, 'Church Street'),
  Text(5, 0, 'JP Nagar'),
  Text(6, 0, 'BTM'),
  Text(7, 0, 'HSR'),
  Text(8, 0, 'Lavelle Road'),
  Text(9, 0, 'Koramangala 7th Block'),
  Text(10, 0, 'Jayanagar'),
  Text(11, 0, 'Whitefield'),
  Text(12, 0, 'Koramangala 6th Block'),
  Text(13, 0, 'Marathahalli'),
  Text(14, 0, 'MG Road'),
  Text(15, 0, 'Brigade Road'),
  Text(16, 0, 'Sarjapur Road'),
  Text(17, 0, 'Residency Road'),
  Text(18, 0, 'Koramangala 1st Block'),
  Text(19, 0, 'Malleshwaram'),
  Text(20, 0, 'Bannerghatta Road'),
  Text(21, 0, 'Bellandur'),
  Text(22, 0, 'Ulsoor'),
  Text(23, 0, 'New BEL Road'),
  Text(24, 0, 'Kalyan Nagar'),
  Text(25, 0, 'Banashankari'),
  Text(26, 0, 'Brookefield'),
  Text(27, 0, 'Richmond Road'),
  Text(28, 0, 'Electronic City'),
  Text(29, 0, 'Kammanahalli'),
  Text(30, 0, 'Frazer Town'),
  Text(31, 0, 'Basavanagudi'),
  Text(32, 0, 'Rajajinagar'),
  Text(33, 0, 'Shanti Nagar'),
  Text(34, 0, 'Banaswadi')])
```



Above bargraph shows location wise number of votes given.

Visualizing top cuisine

In [72]:

```
df6 = df[['cuisines','votes']]
```

In [73]:

```
df6.drop_duplicates()
```

Out[73]:

	cuisines	votes
0	others	775
1	others	787
2	others	918
3	South Indian, North Indian	88
4	others	166
...	...	...
51540	North Indian, South Indian, Chinese	11
51547	South Indian, North Indian, Chinese	203
51590	North Indian, Chinese	515
51607	Finger Food	236
51611	Chinese, Momos	73

5637 rows × 2 columns

In [74]:

```
df7 = df6.groupby(['cuisines'])['votes'].sum()
```

In [75]:

```
df7 = df7.to_frame()
```

In [76]:

```
df7 = df7.sort_values('votes', ascending= False)
df7.head()
```

Out[76]:

	votes
cuisines	
others	12411206
North Indian	516310
North Indian, Chinese	258225
South Indian	161975
Chinese	101728

In [77]:

```
# Removing 'others' cuisine from the table
df7 = df7.iloc[1: , :]
df7.head()
```

Out[77]:

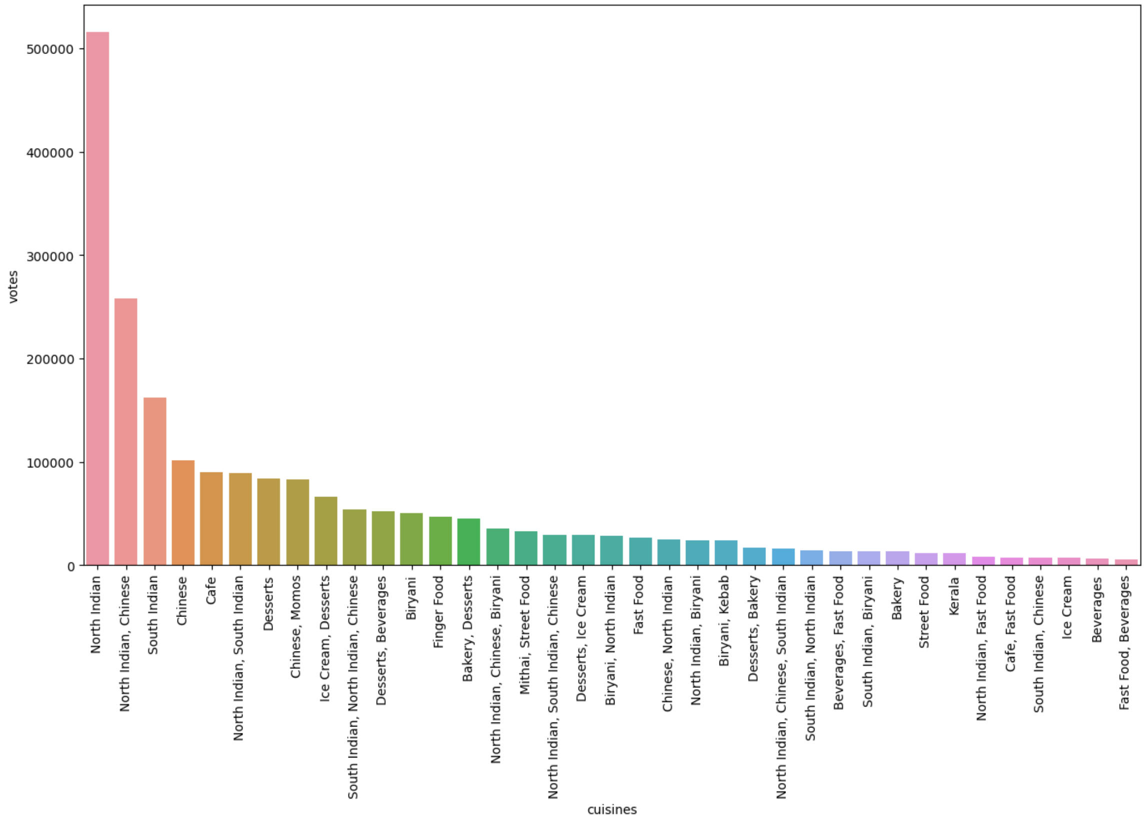
	votes
cuisines	
North Indian	516310
North Indian, Chinese	258225
South Indian	161975
Chinese	101728
Cafe	89986

In [78]:

```
# visualizing types of restaurants w.r.t votes
plt.figure(figsize = (15,8))
sns.barplot(data=df7, x= df7.index, y='votes')
plt.xticks(rotation = 90)
```

Out[78]:

```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 1
6,
        17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 3
3,
        34, 35, 36]),
 [Text(0, 0, 'North Indian'),
  Text(1, 0, 'North Indian, Chinese'),
  Text(2, 0, 'South Indian'),
  Text(3, 0, 'Chinese'),
  Text(4, 0, 'Cafe'),
  Text(5, 0, 'North Indian, South Indian'),
  Text(6, 0, 'Desserts'),
  Text(7, 0, 'Chinese, Momos'),
  Text(8, 0, 'Ice Cream, Desserts'),
  Text(9, 0, 'South Indian, North Indian, Chinese'),
  Text(10, 0, 'Desserts, Beverages'),
  Text(11, 0, 'Biryani'),
  Text(12, 0, 'Finger Food'),
  Text(13, 0, 'Bakery, Desserts'),
  Text(14, 0, 'North Indian, Chinese, Biryani'),
  Text(15, 0, 'Mithai, Street Food'),
  Text(16, 0, 'North Indian, South Indian, Chinese'),
  Text(17, 0, 'Desserts, Ice Cream'),
  Text(18, 0, 'Biryani, North Indian'),
  Text(19, 0, 'Fast Food'),
  Text(20, 0, 'Chinese, North Indian'),
  Text(21, 0, 'North Indian, Biryani'),
  Text(22, 0, 'Biryani, Kebab'),
  Text(23, 0, 'Desserts, Bakery'),
  Text(24, 0, 'North Indian, Chinese, South Indian'),
  Text(25, 0, 'South Indian, North Indian'),
  Text(26, 0, 'Beverages, Fast Food'),
  Text(27, 0, 'South Indian, Biryani'),
  Text(28, 0, 'Bakery'),
  Text(29, 0, 'Street Food'),
  Text(30, 0, 'Kerala'),
  Text(31, 0, 'North Indian, Fast Food'),
  Text(32, 0, 'Cafe, Fast Food'),
  Text(33, 0, 'South Indian, Chinese'),
  Text(34, 0, 'Ice Cream'),
  Text(35, 0, 'Beverages'),
  Text(36, 0, 'Fast Food, Beverages')])
```



Suprisingly 'North Indian' cuisine is the top cuisine in Banglore which is located in South India. This shows that a lot of people from all over the country have emigrated in the city as banglore is the tech hub of india. So, an entrepreneur needs have some differenciating factor if he/she wants to offer north indian cuisine.

Conslusion

In conclusion, the exploratory data analysis of restaurant data in Bangalore has revealed several interesting insights. Firstly, the dominance of 'North Indian' cuisine in a city located in South India suggests the diverse population of Bangalore due to its status as the tech hub of India. For an entrepreneur planning to offer North Indian cuisine, it is crucial to have a differentiating factor to stand out in this competitive market.

The prevalence of 'delivery' restaurants in most locations indicates a strong ordering culture in Bangalore. This insight can be valuable for businesses looking to establish themselves in this market.

'Drinks and Nightlife' and 'Pubs and bars' restaurant types tend to have the highest median ratings, indicating a strong preference for these establishments. Buffet-style restaurants also perform well in terms of ratings.

There is a significant difference in median ratings between restaurants offering table booking and those that do not. This highlights the importance of providing a table booking facility to enhance customer satisfaction and, ultimately, restaurant ratings.

Lastly, the availability of online ordering is a significant trend in Bangalore. As the work culture rapidly evolves in metro cities, providing online order facilities can be a convenient option for both new entrepreneurs looking to start a restaurant and existing restaurant owners.

In conclusion, the insights gathered from this exploratory data analysis can guide entrepreneurs and restaurant owners in making informed decisions to succeed in Bangalore's dynamic and competitive restaurant industry.