```python
import numpy as np
```

```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```python
df=pd.read_csv("zomato.csv")
df
```

Out[4]:

	url	address	name	online_o...
0	https://www.zomato.com/bangalore/jalsa-banasha...	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	
1	https://www.zomato.com/bangalore/spice-elephan...	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	
2	https://www.zomato.com/SanchurroBangalore?cont...	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	
3	https://www.zomato.com/bangalore/addhuri-udupi...	1st Floor, Annakuteera, 3rd Stage, Banashankar...	Addhuri Udupi Bhojana	
4	https://www.zomato.com/bangalore/grand-village...	10, 3rd Floor, Lakshmi Associates, Gandhi Baza...	Grand Village	
...	...	...	...	
51712	https://www.zomato.com/bangalore/best-brews-fo...	Four Points by Sheraton Bengaluru, 43/3, White...	Best Brews - Four Points by Sheraton Bengaluru...	
51713	https://www.zomato.com/bangalore/vinod-bar-and...	Number 10, Garudachar Palya, Mahadevapura, Whi...	Vinod Bar And Restaurant	
51714	https://www.zomato.com/bangalore/plunge-sherat...	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Plunge - Sheraton Grand Bengaluru Whitefield H...	

	url	address	name	online_or
51715	https://www.zomato.com/bangalore/chime-sherato...	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Chime - Sheraton Grand Bengaluru Whitefield Ho...	
51716	https://www.zomato.com/bangalore/the-nest-the-...	ITPL Main Road, KIADB Export Promotion Industr...	The Nest - The Den Bengaluru	

51717 rows × 17 columns

In [6]: `len(df)`

Out[6]: 51717

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

Out[7]:

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

In [8]: df.tail()

Out[8]:

	url	address	name	online_orde
51712	https://www.zomato.com/bangalore/best-brews-fo...	Four Points by Sheraton Bengaluru, 43/3, White...	Best Brews - Four Points by Sheraton Bengaluru...	N
51713	https://www.zomato.com/bangalore/vinod-bar-and...	Number 10, Garudachar Palya, Mahadevapura, Whi...	Vinod Bar And Restaurant	N
51714	https://www.zomato.com/bangalore/plunge-sherat...	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Plunge - Sheraton Grand Bengaluru Whitefield H...	N
51715	https://www.zomato.com/bangalore/chime-sherato...	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Chime - Sheraton Grand Bengaluru Whitefield Ho...	N
51716	https://www.zomato.com/bangalore/the-nest-the-...	ITPL Main Road, KIADB Export Promotion Industr...	The Nest - The Den Bengaluru	N

In [9]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51717 entries, 0 to 51716
Data columns (total 17 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   url                         51717 non-null  object
 1   address                     51717 non-null  object
 2   name                        51717 non-null  object
 3   online_order                51717 non-null  object
 4   book_table                  51717 non-null  object
 5   rate                        43942 non-null  object
 6   votes                       51717 non-null  int64
 7   phone                       50509 non-null  object
 8   location                    51696 non-null  object
 9   rest_type                   51490 non-null  object
 10  dish_liked                  23639 non-null  object
 11  cuisines                    51672 non-null  object
 12  approx_cost(for two people) 51371 non-null  object
 13  reviews_list                51717 non-null  object
 14  menu_item                   51717 non-null  object
 15  listed_in(type)             51717 non-null  object
 16  listed_in(city)             51717 non-null  object
dtypes: int64(1), object(16)
memory usage: 6.7+ MB
```

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

Out[10]:

	votes
count	51717.000000
mean	283.697527
std	803.838853
min	0.000000
25%	7.000000
50%	41.000000
75%	198.000000
max	16832.000000

In [12]: `df.shape`

Out[12]: `(51717, 17)`

In [15]: `df.pop('url')`

```
Out[15]:  0          https://www.zomato.com/bangalore/jalsa-banasha...
          1          https://www.zomato.com/bangalore/spice-elephan...
          2          https://www.zomato.com/SanchurroBangalore?cont...
          3          https://www.zomato.com/bangalore/addhuri-udupi...
          4          https://www.zomato.com/bangalore/grand-village...
                                           ...
          51712      https://www.zomato.com/bangalore/best-brews-fo...
          51713      https://www.zomato.com/bangalore/vinod-bar-and...
          51714      https://www.zomato.com/bangalore/plunge-sherat...
          51715      https://www.zomato.com/bangalore/chime-sherato...
          51716      https://www.zomato.com/bangalore/the-nest-the-...
          Name: url, Length: 51717, dtype: object
```

In [16]: `df`

Out[16]:

	address	name	online_order	book_table	rate	votes	p
0	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	Yes	Yes	4.1/5	775	42297555\r\n 97437
1	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	Yes	No	4.1/5	787	080 417
2	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	Yes	No	3.8/5	918	+91 96634
3	1st Floor, Annakuteera, 3rd Stage, Banashankar...	Addhuri Udupi Bhojana	No	No	3.7/5	88	+91 96200
4	10, 3rd Floor, Lakshmi Associates, Gandhi Baza...	Grand Village	No	No	3.8/5	166	8026612447\r\n 99012
...	...	...	...	...	...	...	
51712	Four Points by Sheraton Bengaluru, 43/3, White...	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	080 403
51713	Number 10, Garudachar Palya, Mahadevapura, Whi...	Vinod Bar And Restaurant	No	No	NaN	0	+91 81976
51714	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	

	address	name	online_order	book_table	rate	votes	p
51715	Sheraton Grand Bengaluru Whitefield Hotel & Co...	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	080 496
51716	ITPL Main Road, KIADB Export Promotion Industr...	The Nest - The Den Bengaluru	No	No	3.4 /5	13	+91 80711

51717 rows × 16 columns

In [17]:
```python
df.pop('address')
```

Out[17]:
```
0        942, 21st Main Road, 2nd Stage, Banashankari, ...
1        2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...
2        1112, Next to KIMS Medical College, 17th Cross...
3        1st Floor, Annakuteera, 3rd Stage, Banashankar...
4        10, 3rd Floor, Lakshmi Associates, Gandhi Baza...
                               ...
51712    Four Points by Sheraton Bengaluru, 43/3, White...
51713    Number 10, Garudachar Palya, Mahadevapura, Whi...
51714    Sheraton Grand Bengaluru Whitefield Hotel & Co...
51715    Sheraton Grand Bengaluru Whitefield Hotel & Co...
51716    ITPL Main Road, KIADB Export Promotion Industr...
Name: address, Length: 51717, dtype: object
```

In [18]:
```python
df
```

	name	online_order	book_table	rate	votes	phone	loca
0	Jalsa	Yes	Yes	4.1/5	775	080 42297555\r\n+91 9743772233	Banashar
1	Spice Elephant	Yes	No	4.1/5	787	080 41714161	Banashar
2	San Churro Cafe	Yes	No	3.8/5	918	+91 9663487993	Banashar
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	+91 9620009302	Banashar
4	Grand Village	No	No	3.8/5	166	+91 8026612447\r\n+91 9901210005	Basavana
...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	080 40301477	White
51713	Vinod Bar And Restaurant	No	No	NaN	0	+91 8197675843	White
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	NaN	White
51715	Chime - Sheraton Grand Bengaluru	No	Yes	4.3 /5	236	080 49652769	ITPL N R White

	name	online_order	book_table	rate	votes	phone	loca
	Whitefield Ho...						
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	+91 8071117272	ITPL N R White

51717 rows × 15 columns

In [19]: `df.pop('phone')`

```
Out[19]: 0          080 42297555\r\n+91 9743772233
         1                        080 41714161
         2                        +91 9663487993
         3                        +91 9620009302
         4        +91 8026612447\r\n+91 9901210005
                               ...
         51712                    080 40301477
         51713                    +91 8197675843
         51714                              NaN
         51715                    080 49652769
         51716                    +91 8071117272
         Name: phone, Length: 51717, dtype: object
```

In [20]: `df`

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	Ch
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	Car Min So
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	Go
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	
51715	Chime - Sheraton Grand Bengaluru	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	C Bu

	name	online_order	book_table	rate	votes	location	rest_type	dis
	Whitefield Ho…							
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	

51717 rows × 14 columns

```
In [21]: df.pop('reviews_list')
```

```
Out[21]: 0        [('Rated 4.0', 'RATED\n  A beautiful place to ...
         1        [('Rated 4.0', 'RATED\n  Had been here for din...
         2        [('Rated 3.0', "RATED\n  Ambience is not that ...
         3        [('Rated 4.0', "RATED\n  Great food and proper...
         4        [('Rated 4.0', 'RATED\n  Very good restaurant ...
                                        ...
         51712    [('Rated 5.0', "RATED\n  Food and service are ...
         51713                                                   []
         51714                                                   []
         51715    [('Rated 4.0', 'RATED\n  Nice and friendly pla...
         51716    [('Rated 5.0', 'RATED\n  Great ambience , look...
         Name: reviews_list, Length: 51717, dtype: object
```

```
In [22]: df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 13 columns

```
In [24]:   df.pop('menu_item')
```

```
Out[24]:   0        []
           1        []
           2        []
           3        []
           4        []
                    ..
           51712    []
           51713    []
           51714    []
           51715    []
           51716    []
           Name: menu_item, Length: 51717, dtype: object
```

```
In [25]:   df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	Ch N
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	Car Min So
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	Go
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	Bu
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

```
In [26]: df['dish_liked']=df['dish_liked'].fillna("not available")
```

```
In [27]: df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	a
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	a
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	a
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	a

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

In [28]:
```python
df['cuisines']=df['cuisines'].fillna(df['cuisines'].mode()[0])
df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

In [29]:
```python
df['location']=df['location'].fillna(df['location'].mode()[0])
```

In [30]:
```python
df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	a
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	a
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	a
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	a

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

In [31]: `df['rest_type']=df['rest_type'].fillna(df['rest_type'].mode()[0])`

In [32]: `df`

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1/5	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1/5	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8/5	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7/5	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8/5	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6 /5	27	Whitefield	Bar	a
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	a
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	a
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3 /5	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4 /5	13	ITPL Main Road, Whitefield	Bar, Casual Dining	a

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

```
In [39]:  df['rate'] = df['rate'].replace(['NEW', '-', ''], pd.NA)
          df
```

	name	online_order	book_table	rate	votes	location	rest_type	dish
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Ch N T
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	C Can Min Sou
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	P Gol
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	a
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	a
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	a
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	C But
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	a

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

In [40]:
```python
df['rate'] = df['rate'].astype(str).str.replace('/5', '')
df
```

	name	online_order	book_table	rate	votes	location	rest_type	dish
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	M Cho N T
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	C Cann Mine Sou
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	Pa Gol
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	av
51713	Vinod Bar And Restaurant	No	No	nan	0	Whitefield	Bar	av
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	nan	0	Whitefield	Bar	av
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	Co But
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	av

name	online_order	book_table	rate	votes	location	rest_type	dish

51717 rows × 12 columns

In [41]:
```python
df['rate'] = pd.to_numeric(df['rate'], errors='coerce')
df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Ch N T
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	C Can Min So
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	P Go
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	av
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	av
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	av
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	Co But
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	av

name	online_order	book_table	rate	votes	location	rest_type	disl

51717 rows × 12 columns

```
In [47]: df['approx_cost(for two people)'] = df['approx_cost(for two people)'].str.replac
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[47], line 1
----> 1 df['approx_cost(for two people)'] = df['approx_cost(for two people)'].st
r.replace(',', '')

File ~\anaconda3\Lib\site-packages\pandas\core\generic.py:6299, in NDFrame.__geta
ttr__(self, name)
   6292 if (
   6293     name not in self._internal_names_set
   6294     and name not in self._metadata
   6295     and name not in self._accessors
   6296     and self._info_axis._can_hold_identifiers_and_holds_name(name)
   6297 ):
   6298     return self[name]
-> 6299 return object.__getattribute__(self, name)

File ~\anaconda3\Lib\site-packages\pandas\core\accessor.py:224, in CachedAccesso
r.__get__(self, obj, cls)
    221 if obj is None:
    222     # we're accessing the attribute of the class, i.e., Dataset.geo
    223     return self._accessor
--> 224 accessor_obj = self._accessor(obj)
    225 # Replace the property with the accessor object. Inspired by:
    226 # https://www.pydanny.com/cached-property.html
    227 # We need to use object.__setattr__ because we overwrite __setattr__ on
    228 # NDFrame
    229 object.__setattr__(obj, self._name, accessor_obj)

File ~\anaconda3\Lib\site-packages\pandas\core\strings\accessor.py:191, in String
Methods.__init__(self, data)
    188 def __init__(self, data) -> None:
    189     from pandas.core.arrays.string_ import StringDtype
--> 191     self._inferred_dtype = self._validate(data)
    192     self._is_categorical = isinstance(data.dtype, CategoricalDtype)
    193     self._is_string = isinstance(data.dtype, StringDtype)

File ~\anaconda3\Lib\site-packages\pandas\core\strings\accessor.py:245, in String
Methods._validate(data)
    242 inferred_dtype = lib.infer_dtype(values, skipna=True)
    244 if inferred_dtype not in allowed_types:
--> 245     raise AttributeError("Can only use .str accessor with string value
s!")
    246 return inferred_dtype

AttributeError: Can only use .str accessor with string values!
```

Assistant

This error occurs because you're trying to use the `.str` accessor on a column that doesn't contain string values. The column `'approx_cost(for two people)'` likely contains numeric values or a mix of data types.

The `.str` accessor can only be used with string values, as the error message indicates.

Would you like me to provide the corrected code?

```python
In [50]:  # First check the data type of the column
          print(df['approx_cost(for two people)'].dtype)

          # Convert the column to string type first, then replace commas
          df['approx_cost(for two people)'] = df['approx_cost(for two people)'].astype(str

          # If you want to convert back to numeric after removing commas
          df['approx_cost(for two people)'] = pd.to_numeric(df['approx_cost(for two people
```

float64

```python
In [51]:  df['approx_cost(for two people)'] = pd.to_numeric(df['approx_cost(for two people

          df
```

	name	online_order	book_table	rate	votes	location	rest_type	dish
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	

name	online_order	book_table	rate	votes	location	rest_type	dis

51717 rows × 12 columns

```
In [52]: df['approx_cost(for two people)'] = df['approx_cost(for two people)'].fillna(df[
         df
```

	name	online_order	book_table	rate	votes	location	rest_type	dis
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	N Ch N T
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	C Can Min So
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	P Go
...	...	...	...	...	...	...	...	
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	a
51713	Vinod Bar And Restaurant	No	No	NaN	0	Whitefield	Bar	a
51714	Plunge - Sheraton Grand Bengaluru Whitefield H...	No	No	NaN	0	Whitefield	Bar	a
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	C But
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	a

	name	online_order	book_table	rate	votes		location	rest_type	dis

51717 rows × 12 columns

In [53]: `df.dropna(inplace=True)`

In [54]: `df`

	name	online_order	book_table	rate	votes	location	rest_type	dish
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	M Cho N T
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	C Cann Mine Sou
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	Pa Gol
...	...	...	...	...	...	...	...	
51709	The Farm House Bar n Grill	No	No	3.7	34	Whitefield	Casual Dining, Bar	av
51711	Bhagini	No	No	2.5	81	Whitefield	Casual Dining, Bar	A
51712	Best Brews - Four Points by Sheraton Bengaluru...	No	No	3.6	27	Whitefield	Bar	av
51715	Chime - Sheraton Grand Bengaluru Whitefield Ho...	No	Yes	4.3	236	ITPL Main Road, Whitefield	Bar	Co But
51716	The Nest - The Den Bengaluru	No	No	3.4	13	ITPL Main Road, Whitefield	Bar, Casual Dining	av

name	online_order	book_table	rate	votes		location	rest_type	dis

41665 rows × 12 columns

In [55]: `df.info()`

```
<class 'pandas.core.frame.DataFrame'>
Index: 41665 entries, 0 to 51716
Data columns (total 12 columns):
 #   Column                     Non-Null Count  Dtype
---  ------                     --------------  -----
 0   name                       41665 non-null  object
 1   online_order               41665 non-null  object
 2   book_table                 41665 non-null  object
 3   rate                       41665 non-null  float64
 4   votes                      41665 non-null  int64
 5   location                   41665 non-null  object
 6   rest_type                  41665 non-null  object
 7   dish_liked                 41665 non-null  object
 8   cuisines                   41665 non-null  object
 9   approx_cost(for two people)  41665 non-null  float64
 10  listed_in(type)            41665 non-null  object
 11  listed_in(city)            41665 non-null  object
dtypes: float64(2), int64(1), object(9)
memory usage: 4.1+ MB
```

In [56]: `df.isnull().sum()`

Out[56]:
```
name                         0
online_order                 0
book_table                   0
rate                         0
votes                        0
location                     0
rest_type                    0
dish_liked                   0
cuisines                     0
approx_cost(for two people)  0
listed_in(type)              0
listed_in(city)              0
dtype: int64
```

In [57]: `df.head()`

	name	online_order	book_table	rate	votes	location	rest_type	dish_liked
0	Jalsa	Yes	Yes	4.1	775	Banashankari	Casual Dining	Pasta, Lunch Buffet, Masala Papad, Paneer Laja...
1	Spice Elephant	Yes	No	4.1	787	Banashankari	Casual Dining	Momos, Lunch Buffet, Chocolate Nirvana, Thai G...
2	San Churro Cafe	Yes	No	3.8	918	Banashankari	Cafe, Casual Dining	Churros, Cannelloni, Minestrone Soup, Hot Choc...
3	Addhuri Udupi Bhojana	No	No	3.7	88	Banashankari	Quick Bites	Masala Dosa
4	Grand Village	No	No	3.8	166	Basavanagudi	Casual Dining	Panipuri, Gol Gappe

```python
sns.histplot(df['rate'], kde=True, color='blue')
plt.title("Distribution of Restaurant Ratings")
plt.xlabel("Rating")
plt.ylabel("Count")
plt.show()
```

Distribution of Restaurant Ratings
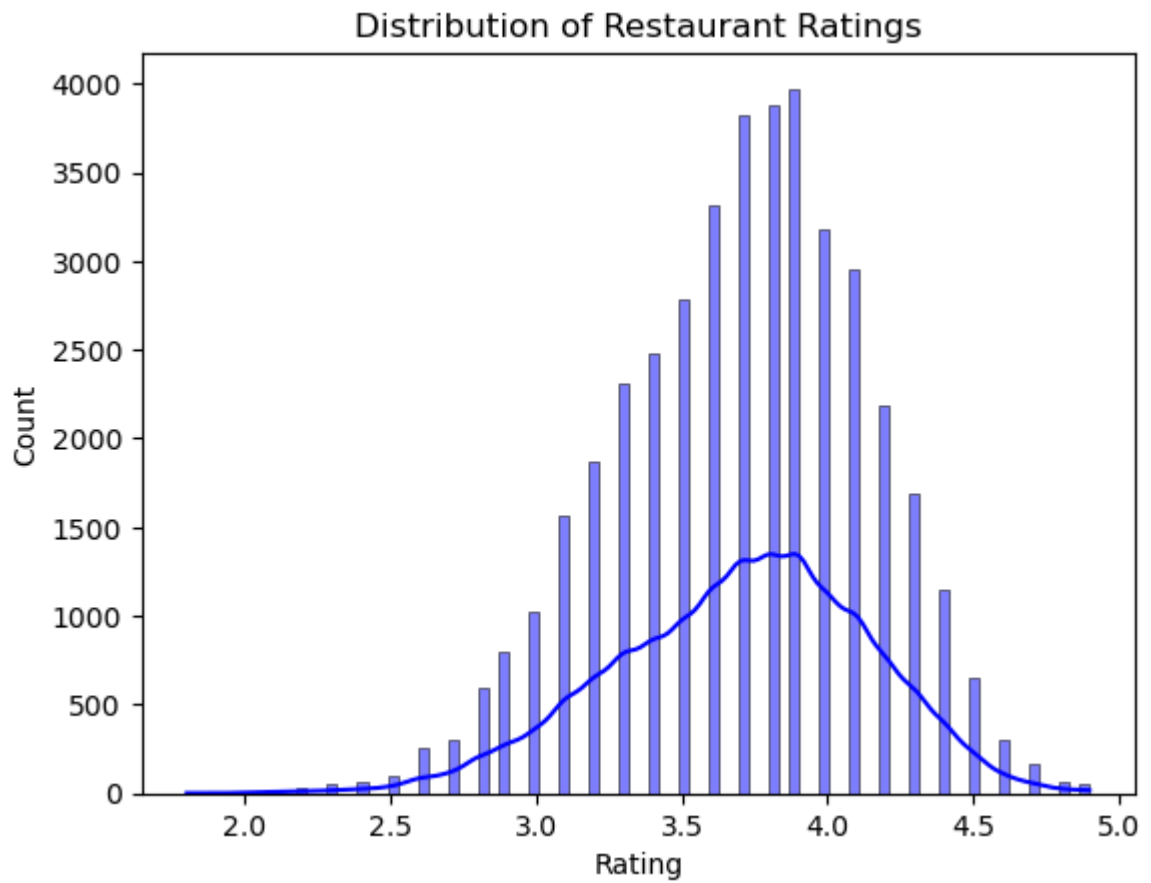

```
In [65]: sns.boxplot(x='online_order', y='rate', data=df)
         plt.title("Online Order vs Rating")
         plt.show()
```

## Online Order vs Rating

In [62]:
```python
sns.boxplot(x='book_table', y='rate', data=df)
plt.title("Table Booking vs Rating")
plt.show()
```

Table Booking vs Rating
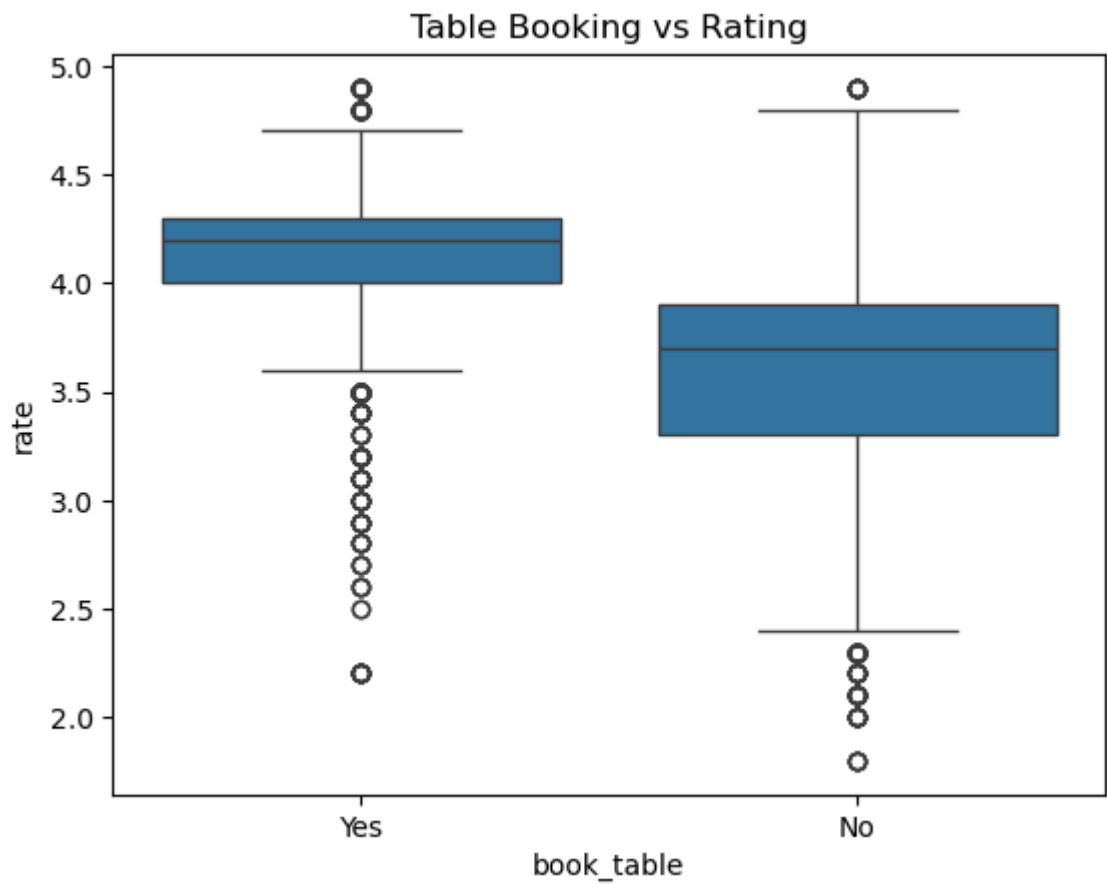
In [66]:
```python
df['location'].value_counts()[:15].plot(kind='bar')
plt.title("Top 15 Locations with Most Restaurants")
plt.xlabel("Location")
plt.ylabel("Count")
plt.show()
```

Top 15 Locations with Most Restaurants
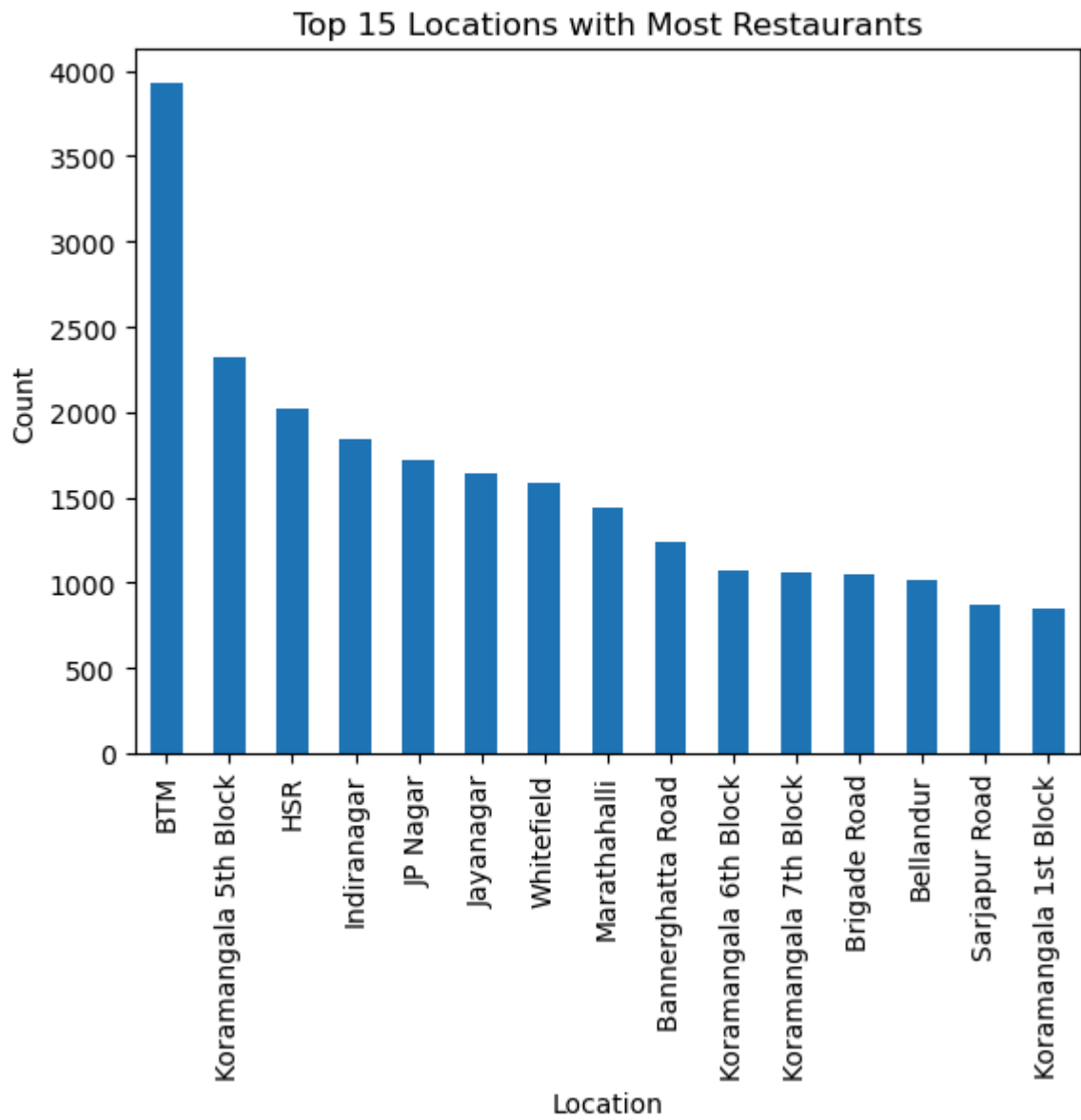
```
In [67]: sns.histplot(df['approx_cost(for two people)'], kde=True)
         plt.title("Distribution of Approx Cost for Two")
         plt.show()
```

Distribution of Approx Cost for Two
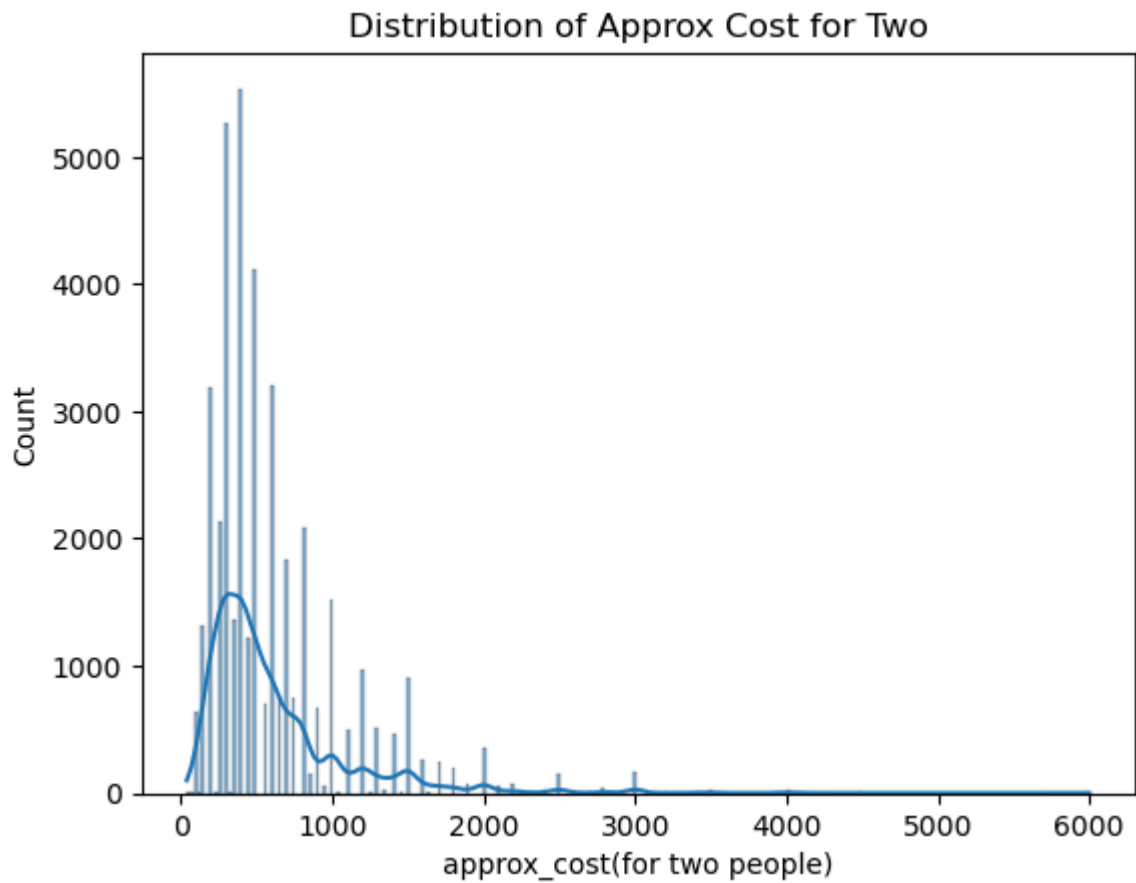

```
In [68]: sns.boxplot(x='rate', y='approx_cost(for two people)', data=df)
         plt.title("Cost for Two vs Rating")
         plt.show()
```
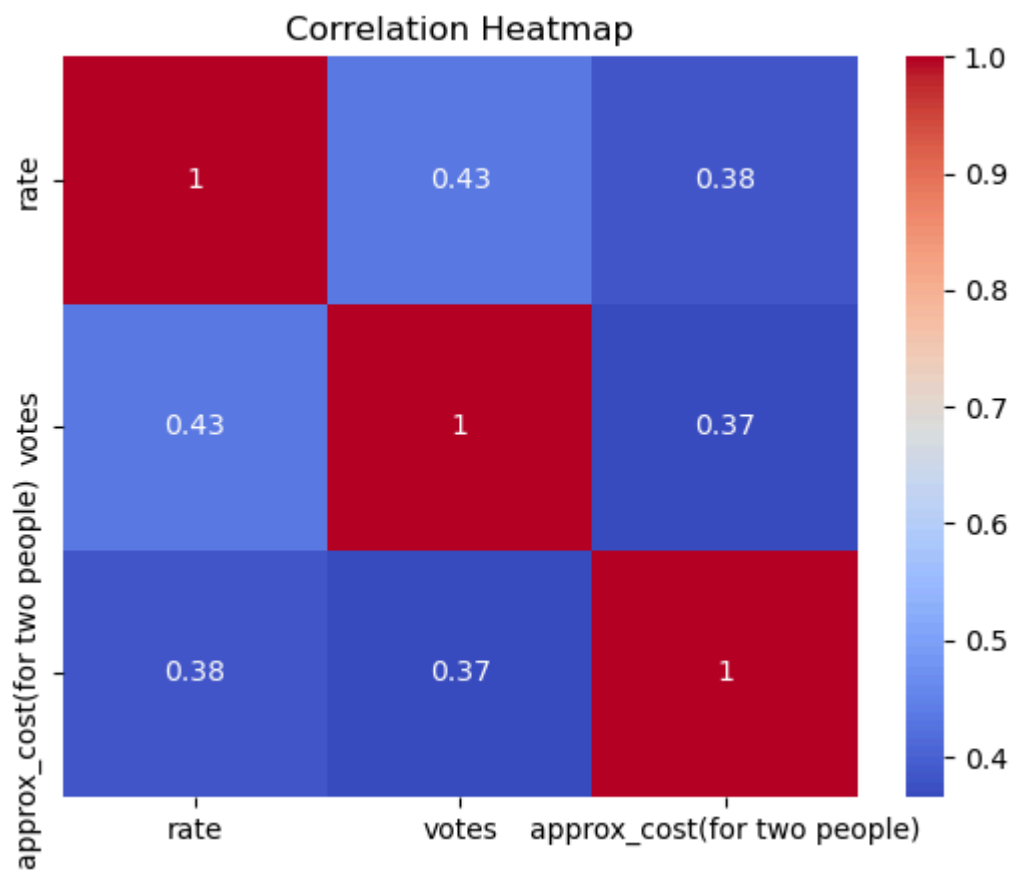
Cost for Two vs Rating
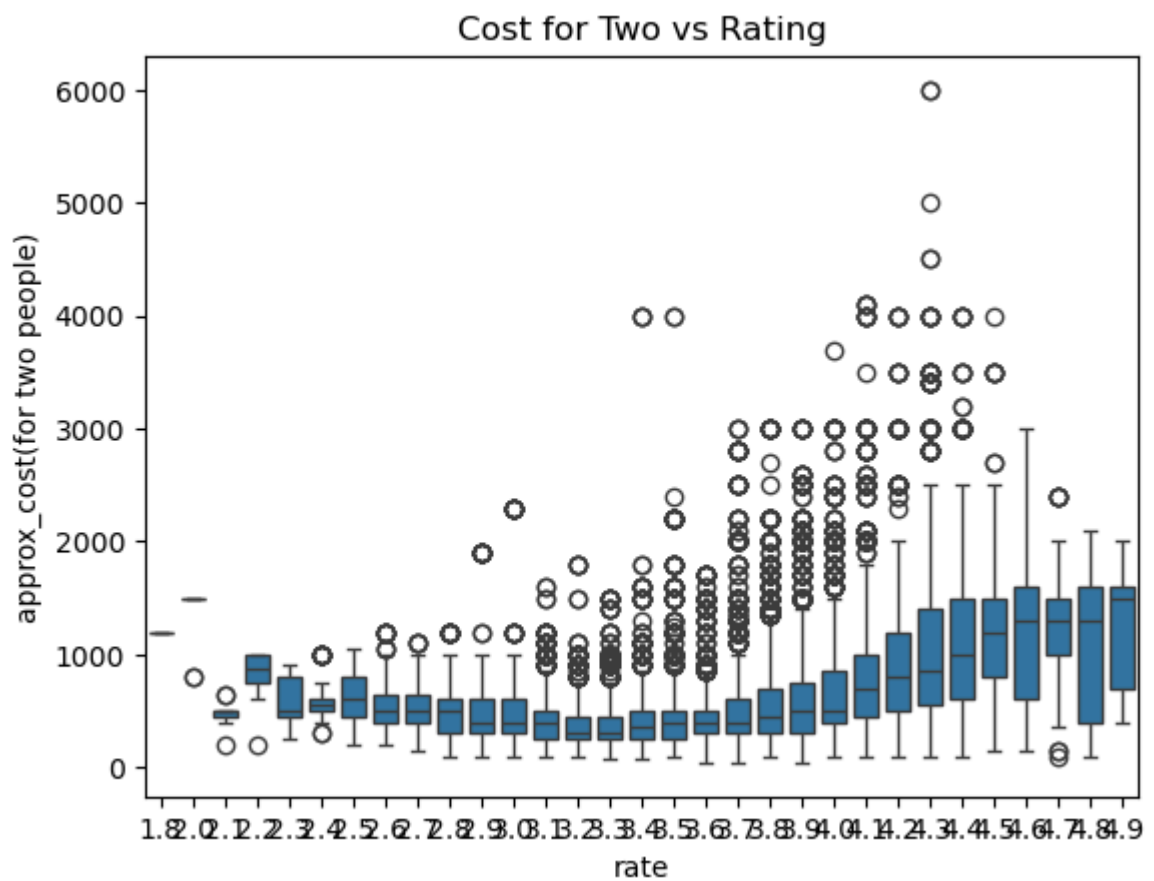
```
In [69]:  cuisine_counts = df['cuisines'].str.split(',').explode().value_counts()[:15]
          sns.barplot(x=cuisine_counts.values, y=cuisine_counts.index)
          plt.title("Top 15 Popular Cuisines")
          plt.xlabel("Count")
          plt.ylabel("Cuisine")
          plt.show()
```


Top 15 Popular Cuisines
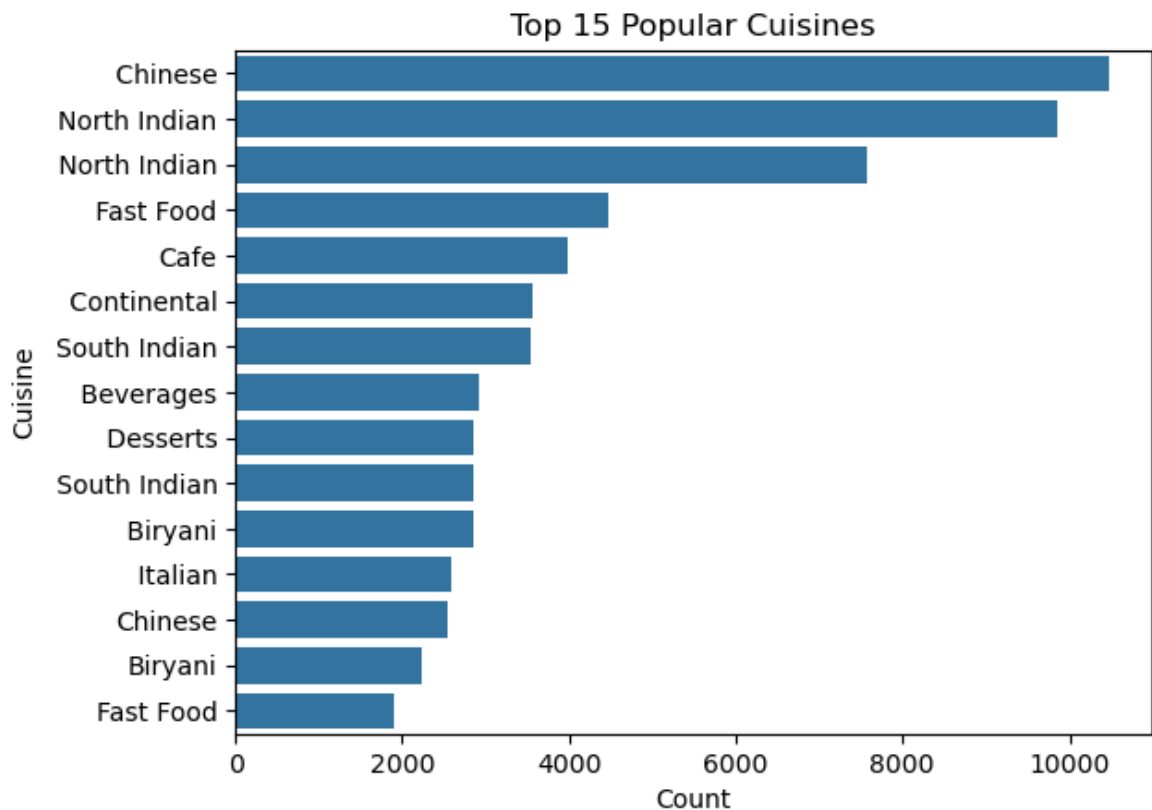
```
In [70]:  rest_type_counts = df['rest_type'].value_counts()[:10]
          sns.barplot(x=rest_type_counts.values, y=rest_type_counts.index)
          plt.title("Most Common Restaurant Types")
          plt.show()
```


Most Common Restaurant Types
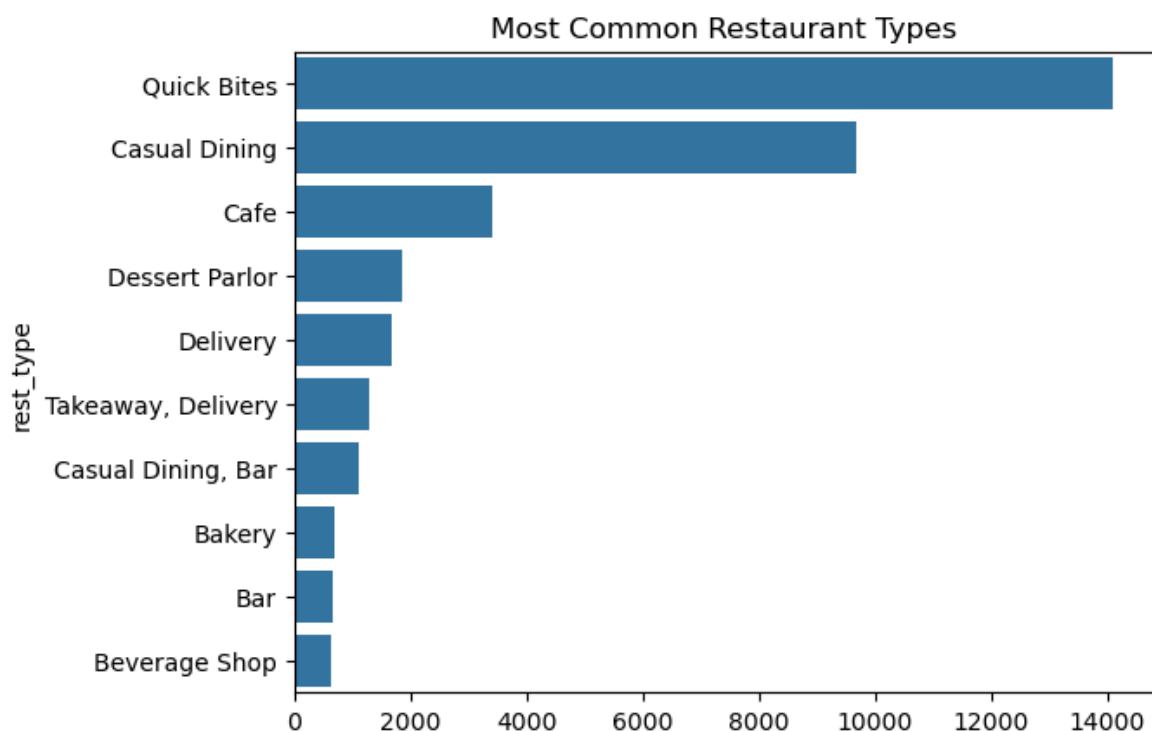
```
In [74]: numeric_df = df.select_dtypes(include=['float64', 'int64'])
         sns.heatmap(numeric_df.corr(), annot=True, cmap='coolwarm')
         plt.title("Correlation Heatmap")
         plt.show()
```

Correlation Heatmap

	rate	votes	approx_cost(for two people)
rate	1	0.43	0.38
votes	0.43	1	0.37
approx_cost(for two people)	0.38	0.37	1

```
In [ ]:
```