

ZOMATO ANALYSIS

WHAT WE CAN DO WITH THIS DATASET

- Knowing basic composition of data
- Removing duplicates
- Dealing with missing values
- Understanding features
- Plotting horizontal bar charts (multicolor)
- Using groupby, apply, and unique functions
- Scatter plot
- Word Cloud
- Box plot
- Density plot
- Bar Charts
- Drawing insights and conclusions from data

Screenshots:

```
[113] import numpy as np
      import pandas as pd
      import matplotlib.pyplot as plt
      import seaborn as sns
```

Upload the CSV File

```
[114] data=pd.read_csv("zomato.csv")
      data
```

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings
0	3400299	Bikanervala	[Quick Bites]	https://www.zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tuli Cinema, Bypass Road,...	Agra	34	Khandari	27.211450	78.002381	Nan	1	Khandari, Agra	Indian, Indian, Mithai, Street Foo...	8:30am – 10:30pm (Mon-Sun)
1	3400005	Mama Chicken Mama Franky House	[Quick Bites]	https://www.zomato.com/agra/mama-chicken-mama-f...	Main Market, Sadar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Fo...	12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat...)
2	3401013	Bhagat Halwai	[Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-2-sh...	62/1, Near Easy Day, West Shivaji Nagar, Goal...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM
3	3400290	Bhagat Halwai	[Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-civil...	Near Aranya Cinema, Nehru Nagar,...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South	8am – 11pm (Mon-Sun)

	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text	votes	photo_count	openable_support	delivery	takeaway
1	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Foo...	8:30am – 10:30pm (Mon-Sun)	700	2	Rs.	['Lunch', 'Takeaway Available', 'Credit Card', ...]	4.4	Very Good	814	154	0.0	-1	-1
1	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Fo...	12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat...)	600	2	Rs.	['Delivery', 'No Alcohol Available', 'Dinner', ...]	4.4	Very Good	1203	161	0.0	-1	-1
1	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	['No Alcohol Available', 'Dinner', 'Takeaway A...']	4.2	Very Good	801	107	0.0	1	-1
1	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South	8am – 11pm (Mon-Sun)	300	1	Rs.	['Takeaway Available', 'Credit Card', ...]	4.3	Very Good	693	157	0.0	1	-1

Looking the first 20 rows of the Dataset.

```
[115] data.head(20)
```

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_...
0	3400299	Bikanervala	[Quick Bites]	https://www.zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tuli Cinema, Bypass Road,...	Agra	34	Khandari	27.211450	78.002381	Nan	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Foo...	8:30am – 10:30pm (Mon-Sun)	
1	3400005	Mama Chicken Mama Franky House	[Quick Bites]	https://www.zomato.com/agra/mama-chicken-mama-f...	Main Market, Sadar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Fo...	12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat...)	
2	3401013	Bhagat Halwai	[Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-2-sh...	62/1, Near Easy Day, West Shivaji Nagar, Goal...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	
3	3400290	Bhagat Halwai	[Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-civil...	Near Aranya Cinema, Nehru Nagar, Civil Lines, ...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	8am – 11pm (Mon-Sun)	
4	3401744	The Salt Cafe Kitchen & Co~	[Casual Dining]	https://www.zomato.com/agra/the-salt-cafe-kitc...	IC 3rd Floor, Fatehabad Road, Tajganj	Agra	34	Tajganj	27.157709	78.052421	Nan	1	Tajganj, Agra	North Indian, Continental, Indian	11:30 AM to 11:30 PM	

14	3400282	Aahar	['Casual Dining']	https://www.zomato.com/agra/aahar-civil-lines?...	26/118, Opposite Income Tax Building, Sanjay P...	Agra	34	Civil Lines	27.199606	78.004528	NaN	1	Civil Lines, Agra	North Indian, South Indian, Chinese, Bakery, C...	10 AM to 11 PM (Mon-Sun)
15	3400611	Domino's Pizza	['Quick Bites']	https://www.zomato.com/agra/domino-s-pizza-kam...	Ground & First Floor, City Mall, Balkeshwar Co...	Agra	34	Kamla Nagar	27.212943	78.026549	NaN	1	Kamla Nagar, Agra	Pizza, Fast Food	10:57 AM to 11 PM
16	3400017	Pinch Of Spice	['Casual Dining']	https://www.zomato.com/agra/pinch-of-spice-civ...	23/453, Opposite Sanjay Cinema, Wazpura Road,...	Agra	34	Civil Lines	27.201735	78.007625	NaN	1	Civil Lines, Agra	North Indian, Chinese, Mughlai	12 Noon to 4 PM, 7 PM to 11:30 PM
17	3400279	Mc Donald's	['Quick Bites']	https://www.zomato.com/agra/mcdonalds-civil-l...	4.5, Ashok Cosmos Mall, Sanjay Place, Civil Li...	Agra	34	Civil Lines	27.201366	78.008746	NaN	1	Civil Lines, Agra	Burger, Fast Food	10 AM to 11 PM (Mon-Sun)
18	3400010	GMB - Gopika Sweets & Restaurant	['Casual Dining']	https://www.zomato.com/agra/gmb-gopika-sweets-...	Crystal Tower, Fatehabad Road, Tagari, Agra	Agra	34	Tajganj	27.162010	78.037996	NaN	1	Tajganj, Agra	Desserts, North Indian, South Indian, Chinese,...	8 AM to 11 PM (Mon-Sun)
19	3400712	The Greener Side	['Quick Bites']	https://www.zomato.com/agra/the-greener-side-c...	Delhi Gate Rd	Agra	34	Civil Lines	27.197103	77.998170	282002.0	1	Civil Lines, Agra	Fast Food, Wraps, Desserts, Beverages	1pm – 10pm (Mon-Sun)

[116] data.describe()															
	res_id	city_id	latitude	longitude	country_id	average_cost_for_two	price_range	aggregate_rating	votes	photo_count	openable_support	delivery	takeaway		
count	2.119440e+05	211944.000000	211944.000000	211944.000000	211944.0	211944.000000	211944.000000	211944.000000	211944.000000	211944.000000	211896.0	211944.000000	211944.0		
mean	1.349411e+07	4746.785434	21.499758	77.615276	1.0	595.812229	1.882535	3.395937	378.001864	256.971224	0.0	-0.255907	-1.0		
std	7.883722e+06	5568.769386	22.781331	7.500104	0.0	606.239363	0.892989	1.283642	925.333370	867.668940	0.0	0.964172	0.0		
min	5.000000e+01	1.000000	0.000000	0.000000	1.0	0.000000	1.000000	0.000000	-18.000000	0.000000	0.0	-1.000000	-1.0		
25%	3.301027e+06	11.000000	15.496071	74.877961	1.0	250.000000	1.000000	3.300000	16.000000	3.000000	0.0	-1.000000	-1.0		
50%	1.869573e+07	34.000000	22.514494	77.425971	1.0	400.000000	2.000000	3.800000	100.000000	18.000000	0.0	-1.000000	-1.0		
75%	1.881297e+07	11306.000000	26.841667	80.219323	1.0	700.000000	2.000000	4.100000	362.000000	128.000000	0.0	1.000000	-1.0		
max	1.915979e+07	11354.000000	10000.000000	91.832769	1.0	30000.000000	4.000000	4.900000	42539.000000	17702.000000	0.0	1.000000	-1.0		

[117] data.shape	
211944	26

[118] data.size	
5510544	

Check the datatypes of all the dataset

[119] data.dtypes	
res_id	int64
name	object
establishment	object
url	object
address	object
city	object
city_id	int64
locality	object
latitude	float64
longitude	float64
zipcode	object
country_id	int64
locality_verbose	object
cuisines	object
timings	object
average_cost_for_two	int64
price_range	int64
currency	object
highlights	object
aggregate_rating	float64
rating_text	object
votes	int64
photo_count	int64
opentable_support	float64
delivery	int64
takeaway	int64

Check the null Values of the various Columns of the dataset

✓ 0s data.isnull().sum()

	0
res_id	0
name	0
establishment	0
url	0
address	134
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	163187
country_id	0
locality_verbose	0
cuisines	1391
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

	data.head(20)	House	Agra	Fast Fo...	Fri, Stat...										
2	3401013	Bhagat Halwai [Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-2-dh...	62/1, Near Easy Day, West End, Agra Nagar Gaol.	Shahganj, Agra	27.182938 77.979684 282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs. [No Alcohol Available', 'Delivery', 'Takeaway', '...]	4.2	Very Good
3	3400290	Bhagat Halwai [Quick Bites]	https://www.zomato.com/agra/bhagat-halwai-oh-...	Near Anjana Bhawan, Nehru Nagar, Civil Lines, Agra	Civil Lines	27.205668 78.004799 282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	Sun - 11pm (Mon-Sun)	300	1	Rs. [Takeaway Available', 'Delivery', 'Credit Card', 'Lunch...', '...]	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar [Casual Dining]	https://www.zomato.com/agra/the-salt-cafe-kitchen-...	10-3rd Floor, Fatehabad Road, Tagore Nagar, Agra	Tagaj, Agra	27.157709 78.052421 NaN	1	Tagaj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs. [Lunch', 'Delivery', 'Alcohol', 'Cash', 'Credit Card', '...]	4.9	Excellent
5	3400275	Domino's Pizza [Quick Bites]	https://www.zomato.com/agra/dominoes-pizza-dvi...	114/23 G, Sector 1, Shikha Complex, Sector 1, Safdarjung Place, Agra	Civil Lines	27.201516 78.007556	NaN	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs. [Credit Card', 'Lunch', 'Delivery', 'Dinner...', '...]	4.0	Very Good
6	3400296	Honeydew Restaurant [Quick Bites]	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Stom Bagh Temple, Dayal Bagh, Agra	Dayal Bagh	27.222175 78.010174 282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, South Indian	11am - 10:30pm (Mon-Fri), Wed, Fri, Sat, 11am...	500	2	Rs. [Dinner', 'Delivery', 'Lunch', 'Cash', 'Takeaway...', '...]	4.2	Very Good
7	3400368	Domino's Pizza [Quick Bites]	https://www.zomato.com/agra/dominoes-pizza-silk...	Plot C-16, Sector 13, Sikandra, Agra	Sikandra	27.203939 77.954260	NaN	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs. [Lunch', 'Delivery', 'Credit Card', 'No Alcohol...', '...]	3.8	Good
8	3401284	Cake House [Bakery]	https://www.zomato.com/agra/cake-house-2-chaw...	23301, Vazirpura, P.D. Marg Compound, Chawripora, Agra	Civil Lines	27.204148 78.009025	NaN	Civil Lines, Agra	Bakery, Fast Food	9 AM to 9 PM	500	2	Rs. [Takeaway Available', 'Delivery', 'Indoor Seating...', '...]	3.4	Average
9	3400838	Sugar N Thyme [Cafe]	https://www.zomato.com/agra/sugarnthyme-n-thyme-leg...	1374 Kt1374, Ground Floor, Dilli Manzil, Near Patel...	Tagaj, Agra	27.158243 78.045991 282001.0	1	Tagaj, Agra	Cafe, Chinese, Continental, Italian, Bakery, D...	12midnight - 1am, 11:30pm - 12midnight (Mon-Sun)	1000	3	Rs. [No Alcohol Available', 'Delivery', 'Dinner', 'Delivery...', '...]	4.4	Very Good

Check the occurrence of the values of establishment column by using value count function

```
[122] data['establishment'].value_counts()
```

establishment	count
['Quick Bites']	64390
['Casual Dining']	61808
['Café']	22760
['Bakery']	8282
['Dessert Parlour']	7961
['Bar']	6553
['Fine Dining']	6401
['Sweet Shop']	6103
['Beverage Shop']	5571
[]	4827
['Dhabā']	2939
['Lounge']	2761
['Food Court']	2722
['Kiosk']	1829
['Bhojanalya']	1400
['Pub']	1396
['Food Truck']	1289
['Microbrewery']	866
['Mess']	611
['Paan Shop']	521
['Club']	340
['Confectionery']	306
['Butcher Shop']	170
['Cocktail Bar']	64
['Shack']	44
['Irani Cafe']	24
['Pop up']	6

dtype: int64

✓ [123] data.isnull().mean()*100

	0
res_id	0.000000
name	0.000000
establishment	0.000000
url	0.000000
address	0.063224
city	0.000000
city_id	0.000000
locality	0.000000
latitude	0.000000
longitude	0.000000
zipcode	76.995338
country_id	0.000000
locality_verbose	0.000000
cuisines	0.656305
timings	1.827841
average_cost_for_two	0.000000
price_range	0.000000
currency	0.000000
highlights	0.000000
aggregate_rating	0.000000
rating_text	0.000000
votes	0.000000
photo_count	0.000000
opentable_support	0.022647
delivery	0.000000
takeaway	0.000000

dtype: float64

Now, Checking the unique values of establishment column

```
✓ [124] data['establishment'].unique()
array(['Quick Bites'], ['Casual Dining'], ['Bakery'], ['Caf  '],
      ['Dhaba'], ['Bhojanalya'], ['Bar'], ['Sweet Shop'],
      ['Fine Dining'], ['Food Truck'], ['Dessert Parlour'],
      ['Lounge'], ['Pub'], ['Beverage Shop'], ['Kiosk'],
      ['Paan Shop'], ['Confectionery'], [], ['Shack'],
      ['Club'], ['Food Court'], ['Mess'], ['Butcher Shop'],
      ['Microbrewery'], ['Cocktail Bar'], ['Pop up'],
      ['Irani Cafe'], dtype=object)
```

Now we will Remove the "[,]" , " " from the values of the establishment column using str.replace function

```
✓ [125] data['establishment']=data['establishment'].str.replace('[ ','').str.replace(' ]','')
```

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_tow	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	'Quick Bites'	https://www.zomato.com/agra/bikanervala-khantha	Kalyani Point, Near Tuli Cinema Bypass Road...	Agra	34	Khandari	27.211450	78.002381	NaN	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Foo...	8:30am – 10:30pm (Mon-Sun)	700	2	Rs.	["Lunch", "Takeaway Available", "Credit Card"]	4.4	Very Good
1	3400095	Mama Chicken Family House	'Quick Bites'	https://www.zomato.com/agra/mama-chicken-mama...	Main Market, Sadar Bazaar, Agra City, Agra	Agra	34	Agra Cantt	27.160569	78.011583	2820010	1	Agra Cantt, Agra	Mughlai, Rajasthani, Fast Food, West Indian, Fast Foo...	12:30PM – 1:30AM (Mon-Fri), 12:30PM – 2:30AM (Sat, Sun)	600	2	Rs.	["Delivery", "No Alcohol Available", "Dinner"]	4.4	Very Good
2	3401913	Bhagat Halwa	'Quick Bites'	https://www.zomato.com/agra/bhagat-halwa-2-in-1	101, Near Jai Daya Sweet Shop, Agra	Agra	34	Shahganj	27.182938	77.979684	282010	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	["No Alcohol Available", "Dinner", "Takeaway"]	4.2	Very Good
3	3400290	Bhagat Halwa	'Quick Bites'	https://www.zomato.com/agra/bhagat-halwa-cv...	Near Jai Daya Cinema, Nehru Colony, Civil Lines, Agra	Agra	34	Chill Lines	27.205668	78.004799	282002	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, Indian, Indian (Mon-Sun)	Sam – 11pm	300	1	Rs.	["Takeaway Available", "Credit Card", "Lunch"]	4.3	Very Good
4	3401744	The Salt Cafe & Kitchen & Bar	'Casual Dining'	https://www.zomato.com/agra/the-salt-cafe-kitchen-bar	1C 3rd Floor, Fatehabad Road, Tagore Nagar, Agra	Agra	34	Tajganj	27.157709	78.054241	NaN	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	["Lunch", "Serves Alcohol", "Cash", "Credit Card"]	4.9	Excellent
5	3400275	Domino's Pizza	'Quick Bites'	https://www.zomato.com/agra/dominoes-pizza-cv...	114/23 G, Deep Shikha Complex, Parayi Place, Agra	Agra	34	Chill Lines	27.201516	78.007556	NaN	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Credit Card", "Lunch", "Delivery", "Dinner"]	4.0	Very Good
6	3400296	Honeydew Restaurant	'Quick Bites'	https://www.zomato.com/agra/honeydew-restaurant	Opposite Scam Bagh Temple, Dyal Bagh, Agra	Agra	34	Dyal Bagh	27.222175	78.010174	282005	1	Dyal Bagh, Agra	North Indian, Fast Indian, Chinese, South Indian	11am – 10:35pm (Mon-Fri), 11am – 11:30pm (Sat, Sun)	500	2	Rs.	["Dinner", "Delivery", "Lunch", "Credit Card", "Takeaway"]	4.2	Very Good
7	3400368	Domino's Pizza	'Quick Bites'	https://www.zomato.com/agra/dominoes-pizza-cv...	Plot No. 1-6, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	NaN	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Lunch", "Delivery", "Credit Card", "No Alcoh..."]	3.8	Good

```
[127] data['establishment'].value_counts()
```

establishment	count
'Quick Bites'	64390
'Casual Dining'	61808
'Café'	22760
'Bakery'	8282
'Dessert Parlour'	7961
'Bar'	6553
'Fine Dining'	6401
'Sweet Shop'	6103
'Beverage Shop'	5571
	4827
'Dhaba'	2939
'Lounge'	2761
'Food Court'	2722
'Kiosk'	1829
'Bhojanalya'	1400
'Pub'	1396
'Food Truck'	1289
'Microbrewery'	866
'Mess'	611
'Paan Shop'	521
'Club'	340
'Confectionery'	306
'Butcher Shop'	170
'Cocktail Bar'	64
'Shack'	44
'Irani Cafe'	24
'Pop up'	6

dtype: int64

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tuli Cinema, Sripuram Road, ...	Agra	34	Khandari	27.211450	78.002381	Nan	1	Khandari, Agra	North Indian, South Indian, Fast Food, Mihai Street Food, ...	8:30AM - 10:30PM (Mon-Sun)	700	2	Rs.	["Lunch", "Takeaway Available", "Credit Card", ...]	4.4	Very Good
1	3400005	Mama Chicken Mama Franky House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-frank...	Main Market, Sadar Bazaar, Agra	Agra	34	Agra Cantt, Agra	27.169569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Chinese, Fast Food, ...	12:30PM to 12:00AM (Mon-Fri, Wed, Thu, Fri, Sat, ...)	600	2	Rs.	["Delivery", "No Alcohol", "Available", "Dinner", ...]	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-sh...	601, Near East Roy, West Shivali Nagar, Gola...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	["No Alcohol", "Available", "Dinner", "Takeaway", ...]	4.2	Very Good
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-civil...	Near Anjuna Cinema, Civil Lines, ...	Agra	34	Civil Lines	27.205988	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, ...	8:30AM - 11PM (Mon-Sun)	300	1	Rs.	["Takeaway Available", "Credit Card", "Lunch", ...]	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen-...	1C,3rd Floor, Fatehabad Road, Agra	Agra	34	Tajganj	27.157709	78.052421	Nan	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	["Lunch", "Serves Alcohol", "Credit Card", "Credit Card", ...]	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civil...	11423 G, Deep Shikha Complex, Sarayi Plaza, ...	Agra	34	Civil Lines	27.201516	78.007556	Nan	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Credit Card", "Lunch", "Delivery", "Dinner", ...]	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Daulat Bagh Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Indian, Chinese, South Indian	11AM - 10:30PM (Mon-Tue, Wed-Fri, Sat, Sun, 11am..)	500	2	Rs.	["Dinner", "Delivery", "Lunch", "Credit Card", "Takeaway", ...]	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-sik...	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	Nan	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Lunch", "Delivery", "Credit Card", "No Alcohol", ...]	3.8	Good

We will Check the null and empty values present in the establishment column

✓ [129] data['establishment'].isnull().mean()*100

0.0

```
✓ 0s  data['establishment'].value_counts()
```

```
count
```

```
establishment
```

Quick Bites	64390
Casual Dining	61808
Café	22760
Bakery	8282
Dessert Parlour	7961
Bar	6553
Fine Dining	6401
Sweet Shop	6103
Beverage Shop	5571
	4827
Dhaba	2939
Lounge	2761
Food Court	2722
Kiosk	1829
Bhojanalya	1400
Pub	1396
Food Truck	1289
Microbrewery	866
Mess	611
Paan Shop	521
Club	340
Confectionery	306
Butcher Shop	170
Cocktail Bar	64
Shack	44
Irani Cafe	24
Pop up	6

```
dtype: int64
```

We will now convert this empty values of establishment column into NAn first then fill this with nan values of the column.

```
✓ 0s [131] data['establishment'] = data['establishment'].replace(r'^\s*$', pd.NA, regex=True)
```

```
data['establishment'].value_counts()
```

```
count
```

establishment	count
Quick Bites	64390
Casual Dining	61808
Café	22760
Bakery	8282
Dessert Parlour	7961
Bar	6553
Fine Dining	6401
Sweet Shop	6103
Beverage Shop	5571
Dhaba	2939
Lounge	2761
Food Court	2722
Kiosk	1829
Bhojanalya	1400
Pub	1396
Food Truck	1289
Microbrewery	866
Mess	611
Paan Shop	521
Club	340
Confectionery	306
Butcher Shop	170
Cocktail Bar	64
Shack	44
Irani Cafe	24
Pop up	6

```
dtype: int64
```

```
✓ [133] data.isnull().sum()
```

	0
res_id	0
name	0
establishment	4827
url	0
address	134
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	163187
country_id	0
locality_verbose	0
cuisines	1391
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

```
✓ [134] data['establishment'].isnull().sum()/len(data)*100
```

2.2774883931604575

	res_id	name establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khanda...	Kalvari Point, Near Tutti Creations Bypass Road., Agra	34	Khandari	27.211450	78.002381	Nan	1	Khandari, Agra	North Indian, South Indian, Middle Eastern, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	[Lunch, 'Takeaway Available', 'Credit Card']	4.4	Very Good
1	3400005	Mama Chicken Mama Franky House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-f...	Main Market, Sadar Bazaar, Agra Civil Lines, Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Chinese, Fast Food...	12:30PM to 12Midnight Mon - Wed, Thu - Fri, Sat...	600	2	Rs.	[Delivery, 'No Alcohol Available', 'Dinner']	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-gh...	621, Near East Day, West Street, Agra, Gonda	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	10AM to 11 PM	300	1	Rs.	[No Alcohol Available, 'Delivery', 'Takeaway', 'A...]	4.2	Very Good
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-civil...	Near Nehru Cinema, Nehru Nagar, Civil Lines, Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	[Delivery Available, 'Credit Card', 'Lunch']	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kit...	1C 3rd Floor, Fatehabad Road, Agra, Tajganj, Agra	34	Tajganj	27.157709	78.052421	Nan	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	[Lunch, 'Serves Alcohol', 'Credit Card', 'Credit Card']	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civil...	11423 G, Deep Shikha Complex, Agra, Sangay Place, C...	34	Civil Lines	27.201516	78.07556	Nan	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	[Credit Card, 'Credit Card', 'Lunch', 'Dinner']	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite State Legislative Assembly, Dayal Bagh, Agra	34	Dayal Bagh	27.222175	78.010714	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, Indian	11:30am - 10:30pm (Mon, Tue, Wed, Fri, Sat, Sun)	500	2	Rs.	[Dinner, 'Delivery', 'Lunch', 'Breakfast', 'Takeaway']	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-sk...	Plot C-1/6, Sector 13, Sikandra, Agra	34	Sikandra	27.203930	77.954260	Nan	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	[Lunch, 'Delivery', 'Credit Card', 'No Alcohol']	3.8	Good
23/301,																				
[Takeaway]																				
11	3400425	Bikanervala	Casual Dining	https://www.zomato.com/agra/bikanervala-tajgan...	ITC Margao Fatehabad Road, Tajganj, Agra	34	Tajganj	27.158549	78.045227	282001.0	1	Tajganj, Agra	Chinese, South Indian, Middle Eastern, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	[Dinner, 'Delivery', 'Breakfast', 'Lunch']	4.4	Very Good
12	3400105	Pizza Hut	Casual Dining	https://www.zomato.com/agra/pizza-hut-tajganj...	8, Handicraft Lane, Fatehabad Road, Tajganj, Agra	34	Tajganj	27.161372	78.034900	Nan	1	Tajganj, Agra	Pizza, Fast Food, Italian	11 AM to 11 PM	700	2	Rs.	[Serves Alcohol, 'Credit Card', 'Takeaway Available']	4.1	Very Good
13	3400457	Yadv Dhaba Purana	Dhaba	https://www.zomato.com/agra/yadv-dhaba-purana...	148, Delhi Gate, Station Road, Raja Bajaji Mandi, C...	34	Civil Lines	27.195836	77.998213	Nan	1	Civil Lines, Agra	North Indian	10:30 AM to 11:30 PM (Mon-Sun)	300	1	Rs.	[Lunch, 'Credit Card', 'No Alcohol Available', 'On...	4.1	Very Good
14	3400282	Ahar	Casual Dining	https://www.zomato.com/agra/ahar-civil-lines...	2611B, Opposite Income Tax Office, Sanjay Puri, Agra	34	Civil Lines	27.199608	78.004528	Nan	1	Civil Lines, Agra	North Indian, South Indian, Chinese, Bakery, C...	10 AM to 11 PM	700	2	Rs.	[Dinner, 'Delivery', 'Lunch', 'Breakfast Available']	4.1	Very Good
15	3400611	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-kam...	Ground & First Floor, City Mall, Bankers Co., Kamla Nagar, Agra	34	Kamla Nagar	27.212943	78.026549	Nan	1	Kamla Nagar, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	[Credit Card, 'Dinner', 'Debit Card', 'Tea']	3.5	Good
16	3400017	Pinch Of Spice	Casual Dining	https://www.zomato.com/agra/pinch-of-spice-civ...	23453, Opposite Sanjay Cinema, Raja Bajaji Road, Agra	34	Civil Lines	27.201735	78.007625	Nan	1	Civil Lines, Agra	North Indian, Chinese, Mughlai	12 Noon to 12 AM, 1PM to 11:30 PM	1600	4	Rs.	[Lunch, 'Delivery', 'Credit Card', 'Dinner']	4.6	Excellent
17	3400279	Mc Donald's	Quick Bites	https://www.zomato.com/agra/mcdonalds-civil-l...	45, Ashok Cosmos Mall, Sanjay Plaza, Civil Lines, Agra	34	Civil Lines	27.201366	78.008748	Nan	1	Civil Lines, Agra	Burger, Fast Food	10 AM to 11 PM	500	2	Rs.	[Lunch, Credit Card, 'No Alcohol Available']	4.3	Very Good
18	3400010	GMD Gopika Sweets & Restaurant	Casual Dining	https://www.zomato.com/agra/gmd-gopika-sweets-...	Crystal Tower, Fatehabad Road, Tajganj, Agra	34	Tajganj	27.162010	78.037996	Nan	1	Tajganj, Agra	Desserts, North Indian, South Indian, Chinese...	8 AM to 11 PM (Mon-Sun)	400	2	Rs.	[Dinner, 'Takeaway Available', 'Breakfast']	4.1	Very Good
19	3400712	The Greener Side	Quick Bites	https://www.zomato.com/agra/the-greener-side-c...	Delhi Gate Rd, Agra	34	Civil Lines	27.197103	77.998170	282002.0	1	Civil Lines, Agra	Fast Food, Wraps, Desserts, Beverages	1pm - 10pm (Mon-Sun)	300	1	Rs.	[Cash, 'Delivery', 'No Alcohol Available']	4.4	Very Good

0s [▶] data.isnull().sum()

	0
res_id	0
name	0
establishment	4827
url	0
address	134
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	163187
country_id	0
locality_verbose	0
cuisines	1391
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

```
[137]: data['establishment'].value_counts()
```

	count
Quick Bites	64390
Casual Dining	61808
Café	22760
Bakery	8282
Dessert Parlour	7961
Bar	6553
Fine Dining	6401
Sweet Shop	6103
Beverage Shop	5571
Dhaba	2939
Lounge	2761
Food Court	2722
Kiosk	1829
Bhojanalya	1400
Pub	1396
Food Truck	1289
Microbrewery	866
Mess	611
Paan Shop	521
Club	340
Confectionery	306
Butcher Shop	170
Cocktail Bar	64
Shack	44
Irani Cafe	24
Pop up	6

```
]
```

```
dtype: int64
```

now we will fill the nan values of establishment column with mode value

```
✓ [138] mode_establishment=data['establishment'].mode()[0]
      data['establishment']=data['establishment'].fillna(mode_establishment)
```

```
✓ [139] data.isnull().sum()
```

	0
res_id	0
name	0
establishment	0
url	0
address	134
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	163187
country_id	0
locality_verbose	0
cuisines	1391
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

Now we will work on the address column to fill the null values of the address column with mode values

```
[140] data['address'].value_counts()
```

address	count
Laxman Jhula, Tapovan, Rishikesh	299
Manu Temple Road, Old Manali, Manali	253
Mallital, Mall Road, Nainital	183
The Mall, The Mall Road, Mussoorie	183
Gari Parao, Mallital, Mall Road, Nainital	171
...	...
Shop 76, Sector 8, Faridabad	1
611/3, B Block, Side 1, Opposite Jetking, Vikas Puri, New Delhi	1
Near Nala Road, Vashist Park, Janakpuri, New Delhi	1
Dal Mill Road, Uttam Nagar, New Delhi	1
G-2, Vedant Platina, Near Cosmos, Akota, Vadodara	1

50657 rows × 1 columns

dtype: int64

```
[141] mode_address=data['address'].mode()[0]
      data['address']=data['address'].fillna(mode_address)
```

```
✓ [141] mode_address=data['address'].mode()[0]
data['address']=data['address'].fillna(mode_address)

✓ [142] data.isnull().sum()

      0
res_id          0
name            0
establishment   0
url             0
address         0
city            0
city_id         0
locality        0
latitude        0
longitude       0
zipcode         163187
country_id      0
locality_verbose 0
cuisines        1391
timings         3874
average_cost_for_two 0
price_range     0
currency        0
highlights      0
aggregate_rating 0
rating_text     0
votes           0
photo_count     0
opentable_support 48
delivery         0
takeaway         0

dtype: int64
```

Moving towards the zipcode ,we will use mode technique to fill the null values as it will not show accurate zipcode if we use mean technique to fill the values

```
0s [143] data['zipcode'].value_counts()  
count  
zipcode  
0      7100  
0.0     2757  
482001    918  
313001     750  
305001     578  
...       ...  
700028      1  
Kolkata-20   1  
27          1  
700124      1  
390004.0    1  
1311 rows × 1 columns  
dtype: int64
```

```
✓ [144] mode_zipcode=data['zipcode'].mode()[0]
data['zipcode']=data['zipcode'].fillna(mode_zipcode)
data.isnull().sum()
```

	0
res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	1391
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

```
[145]: data['cuisines'].value_counts()
```

cuisines	count
North Indian	15996
Fast Food	6721
Cafe	6190
North Indian, Chinese	5820
South Indian	5217
...	...
North Indian, Chinese, Continental, Healthy Food	1
Mughlai, North Indian, Chinese, Continental, Italian	1
Burger, Rolls, Fast Food	1
Fast Food, Chinese, Burger	1
North Indian, Lucknowi, Chinese	1

9382 rows × 1 columns

dtype: int64

missing values of cuisines column is filled with mode method

```
✓ [146] mode_cuisines=data['cuisines'].mode()[0]
      data['cuisines']=data['cuisines'].fillna(mode_cuisines)
      data.isnull().sum()
```

res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	0
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

✓ [147] data['timings'].value_counts()

	count
timings	
11 AM to 11 PM	26605
10 AM to 10 PM	5419
11 AM to 10 PM	4933
11 AM to 11 PM (Mon-Sun)	4063
10 AM to 11 PM	3949
...	...
1pm – 11pm (Mon-Tue),5pm – 11pm (Wed),5pm – 11:15pm (Thu-Sun)	1
3 PM to 11:45 PM	1
11 AM to 11:39 PM	1
4 AM to 12:30 AM	1
4pm – 11pm (Mon, Tue, Wed, Fri, Sat, Sun), 4pm – 11:30pm (Thu)	1

7740 rows × 1 columns

dtype: int64

res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khandari-1-shahganj-agra	Kalyani Ponkiwala Tuli Cinema, Agra	Agra	34	Khandari	27.211450	78.002381	0	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Food	8:30am – 10:30pm (Mo-Sun)	700	2	Rs. Available 'Credit Card'	4.4	Very Good	
1	Mama China Mama France House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-quick-bites	Main Market, Sadar Bazaar, Agra	Agra	34	Agra Cantt, Agra	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Ribs, Chinese, Fast Fo.	12:30PM to 12:45AM (Mo-Fri, Sun)	600	2	Rs. ['Delivery', 'No Alcohol Available', 'Dinner', 'Takeaway']	4.4	Very Good	
2	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-sh-	621, Near Easy Day, West Shivali, Agra	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs. ['No Alcohol Available', 'Dinner', 'Takeaway', 'A-']	4.2	Very Good	
3	Bhagat Halwai	Quick Bites	http://www.zomato.com/agra/bhagat-halwai-civil-lines	Near Arjana Cinema, Arjana, Agra	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	8am – 11:30pm (Mon-Sun)	300	1	Rs. ['Takeaway', 'Available', 'Credit Card', 'Lunch']	4.3	Very Good	
4	The Salt Cafe & Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen-bar	11, Old Food Fatehabad Road, Tajganj, Agra	Agra	34	Tajganj	27.157709	78.054241	0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs. ['Lunch', 'Service Available', 'Cash', 'Credit Card']	4.9	Excellent	
5	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civil-lines	114/23 G, Opp Shitala Complex, Civil Lines, Place C	Agra	34	Civil Lines	27.201516	78.007566	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs. ['Credit Card', 'Lunch', 'Delivery', 'Dinner']	4.0	Very Good	
6	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant	Opposite Saini Bagh Temple, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, South Indian	11am – 10:30pm (Mo-Sun, Wed, Fri, Sat)	500	2	Rs. ['Dinner', 'Delivery', 'Lunch', 'Credit Card', 'Takeaway']	4.2	Very Good	
7	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-ekka	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.263930	77.954269	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs. ['Lunch', 'Delivery', 'Credit Card', 'No Alcohol']	3.8	Good	

✓ [149] data.shape

211944, 26

We use display maximum column technique to view all the columns of the dataset

We use display maximum column technique to view all the columns of the dataset

```
[150] pd.set_option('display.max_columns', None)
      print(data)

      res_id          name establishment \
0    3400299        Bikanervala   Quick Bites
1    3400005  Mama Chicken Mama Franky House   Quick Bites
2    3401013        Bhagat Halwai   Quick Bites
3    3400290        Bhagat Halwai   Quick Bites
4    3401744  The Salt Cafe Kitchen & Bar Casual Dining
...       ...
211939  3202251  Kali Mirch Cafe And Restaurant   Casual Dining
211940  3200996           Raju Omlet   Quick Bites
211941  18984164        The Grand Thakar   Casual Dining
211942  3201138           Subway   Quick Bites
211943  18879846  Freshco's - The Health Cafe     Café

      url \
0  https://www.zomato.com/agra/bikanervala-khanda...
1  https://www.zomato.com/agra/mama-chicken-mama-...
2  https://www.zomato.com/agra/bhagat-halwai-2-sh...
3  https://www.zomato.com/agra/bhagat-halwai-civi...
4  https://www.zomato.com/agra/the-salt-cafe-kitc...
...       ...
211939 https://www.zomato.com/vadodara/kali-mirch-caf...
211940 https://www.zomato.com/vadodara/raju-omlet-kar...
211941 https://www.zomato.com/vadodara/the-grand-thak...
211942 https://www.zomato.com/vadodara/subway-1-akota...
211943 https://www.zomato.com/vadodara/freshcos-the-h...

      address      city city_id \
0  Kalyani Point, Near Tulsi Cinema, Bypass Road,...  Agra    34
1  Main Market, Sadar Bazaar, Agra Cantt, Agra  Agra    34
2  62/1, Near Easy Day, West Shivaji Nagar, Goalp...  Agra    34
3  Near Anjana Cinema, Nehru Nagar, Civil Lines, ...  Agra    34
4  1C,3rd Floor, Fatehabad Road, Tajganj, Agra  Agra    34
...       ...
211939  Manu Smriti Complex, Near Navrachna School, GI...  Vadodara    32
211940  Mahalaxmi Apartment, Opposite B O B, Karoli Ba...  Vadodara    32
211941  3rd Floor, Shreem Shalini Mall, Opposite Conqu...  Vadodara    32
211942  G-2, Vedant Platina, Near Cosmos, Akota, Vadodara  Vadodara    32
211943  Shop 7, Ground Floor, Opposite Natubhai Circle...  Vadodara    32

      locality  latitude  longitude  zipcode country_id \
0    Khandari  27.211450  78.002381      0         1
1    Agra Cantt  27.160569  78.011583  282001.0        1
2    Shahganj  27.182938  77.979684  282010.0        1
3    Civil Lines  27.205668  78.004799  282002.0        1
4    Tajganj  27.157709  78.052421      0         1
...       ...
211939  Fatehgunj  22.336931  73.192356  390024.0        1
211940  Karelibaug  22.322455  73.197203      0         1
211941  Alkapuri  22.310563  73.171163      0         1
211942    Akota  22.270027  73.143068      0         1
```

```
    cuisines \
0      North Indian, South Indian, Mithai, Street Foo...
1      North Indian, Mughlai, Rolls, Chinese, Fast Fo...
2                      Fast Food, Mithai
3      Desserts, Bakery, Fast Food, South Indian
4      North Indian, Continental, Italian
...
211939          ...
211940          ...
211941          ...
211942          ...
211943          ...

    timings \
0      8:30am - 10:30pm (Mon-Sun)
1      12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat...)
2      9:30 AM to 11 PM
3      8am - 11pm (Mon-Sun)
4      11:30 AM to 11:30 PM
...
211939          ...
211940 4pm - 11pm (Mon, Tue, Wed, Fri, Sat, Sun), 4pm...
211941          ...
211942          ...
211943          ...

    average_cost_for_two price_range currency \
0      700      2      Rs.
1      600      2      Rs.
2      300      1      Rs.
3      300      1      Rs.
4      1000     3      Rs.
...
211939          ...
211940          ...
211941          ...
211942          ...
211943          ...

    highlights aggregate_rating \
0      ['Lunch', 'Takeaway Available', 'Credit Card',...
1      ['Delivery', 'No Alcohol Available', 'Dinner',...
2      ['No Alcohol Available', 'Dinner', 'Takeaway A...
3      ['Takeaway Available', 'Credit Card', 'Lunch',...
4      ['Lunch', 'Serves Alcohol', 'Cash', 'Credit Ca...
...
211939          ...
211940          ...
211941          ...
211942          ...
```

	Fast Food, Sandwich, Salad
	Cafe, Healthy Food, Coffee
0	timings \ 8:30am - 10:30pm (Mon-Sun)
1	12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat... 9:30 AM to 11 PM
2	8am - 11pm (Mon-Sun) 8 AM to 1 AM
3	11:30 AM to 11:30 PM ... 11am - 3pm, 7pm - 11:30pm (Mon-Sun)
4	4pm - 11pm (Mon, Tue, Wed, Fri, Sat, Sun), 4pm... 7am - 11pm (Mon-Sun)
...	
211939	11:30 AM to 3:30 PM, 7:30 PM to 11 PM
211940	8 AM to 1 AM
211941	7am - 11pm (Mon-Sun)
211942	average_cost_for_two price_range currency \ 700 2 Rs.
211943	600 2 Rs.
1	300 1 Rs.
3	300 1 Rs.
4	1000 3 Rs.
...	...
211939	600 2 Rs.
211940	300 1 Rs.
211941	700 2 Rs.
211942	500 2 Rs.
211943	600 2 Rs.
...	highlights aggregate_rating \
0	['Lunch', 'Takeaway Available', 'Credit Card',... 4.4
1	['Delivery', 'No Alcohol Available', 'Dinner',... 4.4
2	['No Alcohol Available', 'Dinner', 'Takeaway A... 4.2
3	['Takeaway Available', 'Credit Card', 'Lunch',... 4.3
4	['Lunch', 'Serves Alcohol', 'Cash', 'Credit Ca... 4.9
...	...
211939	['Dinner', 'Cash', 'Lunch', 'Delivery', 'Indoo... 4.1
211940	['Dinner', 'Cash', 'Takeaway Available', 'Debi... 4.1
211941	['Dinner', 'Cash', 'Debit Card', 'Lunch', 'Tak... 4.0
211942	['Dinner', 'Delivery', 'Credit Card', 'Lunch',... 3.7
211943	['Dinner', 'Cash', 'Takeaway Available', 'Debi... 4.0
rating_text	votes photo_count opentable_support delivery takeaway
0	Very Good 814 154 0.0 -1 -1
1	Very Good 1203 161 0.0 -1 -1
2	Very Good 801 107 0.0 1 -1
3	Very Good 693 157 0.0 1 -1
4	Excellent 470 291 0.0 1 -1
...	...
211939	Very Good 243 40 0.0 -1 -1
211940	Very Good 187 40 0.0 1 -1
211941	Very Good 111 38 0.0 -1 -1
211942	Good 128 34 0.0 1 -1
211943	Very Good 93 53 0.0 1 -1

[211944 rows x 26 columns]

	0
res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	0
timings	3874
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	48
delivery	0
takeaway	0

dtype: int64

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
	[132]	mode_timings	data["timings"] mode)[0]																		
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-wanda	Kalyani Point, Near Tutti Cinema Bypass Road...	Agra	34	Khandari	27.211450	78.002381	0	1	Khandari, Agra	North Indian, South Indian, Italian, Fast Food, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	{ "Lunch", "Takeaway Available", "Credit Card" }	4.4	Very Good
1	3400005	Mama Chicken	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-fairy-house	Main Market, Sadar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Food...	12:30PM - 12:00midnight (Mon-Fri), 11AM - 11PM (Sat-Sun)	600	2	Rs.	{ "Delivery", "No Alcohol Available", "Dinner", "Takeaway" }	4.4	Very Good
2	3401013	Bhagat Haveli	Quick Bites	https://www.zomato.com/agra/bhagat-haveli-2-haveli	821, Near Easy Day Wedding Hall, Agra	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	{ "No Alcohol Available", "Dinner", "Takeaway" }	4.2	Very Good
3	3400090	Bhagat Haveli	Quick Bites	https://www.zomato.com/agra/bhagat-haveli-chowk	New Agra Cinema, Nehru Nagar, Agra	Agra	34	Civil Lines	27.205668	78.004794	282002.0	1	Civil Lines, Agra	Deserts, Bakery, Fast Food, North Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	{ "Takeaway Available", "Credit Card", "Lunch" }	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen-bar	1C, 3rd Floor, Federation Road, Tagore Garden, Agra	Agra	34	Tagore	27.157709	78.052421	0	1	Tagore, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	{ "Lunch", "Severes Credit Card", "Credit Card" }	4.9	Excellent
5	3400025	Dominos Pizza	Quick Bites	https://www.zomato.com/agra/dominos-pizza-cvci	11423 G, Deep Shikha Complex, Sanjay Park, Agra	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	{ "Credit Card", "Lunch", "Dinner", "Takeaway" }	4.0	Very Good
6	3400096	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant	Opposite Dargah Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, West Indian, South Indian, Sat.,	11am - 10:30pm (Mon-Tue), 11am - 11pm (Wed-Fri), 11am - 12pm (Sat),	500	2	Rs.	{ "Dinner", "Lunch", "Credit Card", "Takeaway" }	4.2	Very Good

```
✓ [153] data.isnull().sum()
   ↴
      res_id      0
      name        0
      establishment      0
      url         0
      address      0
      city         0
      city_id      0
      locality      0
      latitude      0
      longitude      0
      zipcode      0
      country_id      0
      locality_verbose      0
      cuisines      0
      timings        0
      average_cost_for_two      0
      price_range      0
      currency        0
      highlights      0
      aggregate_rating      0
      rating_text      0
      votes          0
      photo_count      0
      opentable_support    48
      delivery        0
      takeaway        0
      dtype: int64
```

Check the unique values present in the opentable_support column and then filled that with mode method

```
✓ [154] data['opentable_support'].unique()
   ↴
array([ 0., nan])
```

```
os [45]: mode_opentable_support=data['opentable_support'].mode()[0]
data['opentable_support']=data['opentable_support'].fillna(mode_opentable_support)
data.isnull().sum()
```

	0
res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	0
timings	0
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	0
delivery	0
takeaway	0

dtype: int64

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khanda...	Kalan Point Near Tuli Chowk Bypass Road...	Agra	34	Khandari	27.211450	78.002381	0	1	Khandari, Agra	North Indian, South Indian, Mithai, Sweet Foo...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	['Lunch', 'Takeaway Available', 'Credit Card ...']	4.4	Very Good
1	3400005	Mama Chicken Mama Party House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-pa...	Man Market, Sader Bazaar, Agra	Agra Cantt	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mithai, Fast Foo...	12:30PM to 10:30PM (Mon-Fri, Sat, Sun)	600	2	Rs.	['Delivery', 'No Alcohol', 'Dinner', '...']	4.4	Very Good
2	3401013	Bagat Halwai	Quick Bites	https://www.zomato.com/agra/bagat-halwai-2-sh...	621, Near Easy Day, West Patelwali, Agra	Agra	34	Shahganj	27.162938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	['No Alcohol Available', 'Dinner', 'Takeaway ...']	4.2	Very Good
3	3400290	Bagat Halwai	Quick Bites	https://www.zomato.com/agra/bagat-halwai-ov...	Near Anjana Cinema, Nehru Nagar, Civil Lines	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Deserts, Biryani, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	['Takeaway Available', 'Credit Card', 'Lunch', '...']	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen...	103rd Floor, Fatehabad Road, Tejganj, Agra	Agra	34	Tejganj	27.157709	78.052421	0	1	Tejganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	['Lunch', 'Dinner', 'Alcohol', 'Credit Card', 'Credit Ca...']	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civ...	11423 G, Deep Shikha Complex, Sector 1, Sahay...	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	['Credit Card', 'Lunch', 'Delivery', 'Dinner', '...']	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Soami Bagh Complex, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	Indian, Fast Food, Chinese, South Indian	11am - 10:30pm (Mon-Tue, Wed, Fri, Sat, Sun)	500	2	Rs.	['Dinner', 'Delivery', 'Lunch', 'Credit Card', 'Takeaway ...']	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-sila...	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	['Lunch', 'Delivery', 'Credit Card', 'No Alcohol', '...']	3.8	Good

✓ [157] data.isnull().sum()

res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	0
timings	0
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	0
delivery	0
takeaway	0

dtype: int64

we will work on the highlights column in order to clean this column and use str.replace method to remove "[]" and "'''".

```
✓ [158] data['highlights'].value_counts()
```

	highlights	count
	['Dinner', 'Takeaway Available', 'Lunch', 'Cash', 'Indoor Seating']	3352
	['Dinner', 'Delivery', 'Lunch', 'Cash', 'Takeaway Available', 'Indoor Seating']	2491
	[]	2069
	['Dinner', 'Cash', 'Takeaway Available', 'Debit Card', 'Lunch', 'Delivery', 'Credit Card', 'Indoor Seating', 'Air Conditioned']	1200
	['Lunch', 'Cash', 'Takeaway Available', 'No Alcohol Available', 'Dinner', 'Delivery', 'Indoor Seating']	1071

	['Takeaway Available', 'Dinner', 'Cash', 'Delivery', 'Outdoor Seating', 'Digital Payments Accepted']	1
	['Cash', 'Delivery', 'Takeaway Available', 'Outdoor Seating', 'Digital Payments Accepted']	1
	['Cash', 'Delivery', 'Dinner', 'Takeaway Available', 'Outdoor Seating']	1
	['No Seating Available', 'Takeaway Available', 'Lunch', 'Mall Parking', 'Dinner', 'Cash', 'Self Service']	1
	['Dinner', 'Cash', 'Takeaway Available', 'Debit Card', 'Delivery', 'Credit Card', 'Free Parking', 'Outdoor Seating']	1

31455 rows × 1 columns

dtype: int64

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khandar	Kalyani Point, Near Nuti Chetna Bypass Road...	Agra	34	Khandar	27.161450	78.002381	0	1	Khandar, Agra	North Indian, South Indian, Mughlai, (Mon-Sun) Fast Fo...	12:30PM - 10:30pm	700	2	Rs.	["Lunch", "Takeaway Available", "Credit Card"]	4.4	Very Good
1	3400005	Mama Chicken Mama Franky House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-franky-house	Main Market, Sadar Bazaar, Agra, Agra, Agra, Agra...	Agra	34	Agra Cantt, Agra	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, (Mon-Fri), Wed, Thu, Fast Fo...	12:30PM - 12Midnight	600	2	Rs.	["Delivery", "No Alcohol Available", "Dinner", ...]	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-sh	62/1, Near Nehru Cinema, Nehru Nagar, Civil Lines...	Agra	34	Shahganj	27.162938	77.979584	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	["No Alcohol Available", "Delivery", "Takeaway Available"]	4.2	Very Good
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-civil-lines	Near Nehru Cinema, Nehru Nagar, Civil Lines...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Deserts, Bakery, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	["Takeaway Available", "Credit Card", "Lunch", ...]	4.3	Very Good
4	3401744	The Sat Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-sat-cafe-kitchen-bar	1C, 3rd Floor, Falguni Sadar, Agra, Agra, Agra...	Agra	34	Tajganj	27.157709	78.052421	0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	["Delivery", "Credit Card", "Credit Card", "Lunch", "Delivery", "Takeaway Available"]	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-dominos-pizza-aria	11423 G, Deep Shikha Colony, Sector 13, Sarjapur Place, C...	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Credit Card", "Lunch", "Delivery", "Dinner", ...]	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant	Opposite Sona Bagh Hotel, Dayal Bagh, Agra, Agra...	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, South Indian	11am - 11pm (Mon, Tue, Wed, Thu, Fri, Sat, Sun)	500	2	Rs.	["Dinner", "Delivery", "Lunch", "Credit Card", "Takeaway Available"]	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-dominos-pizza-aria	Plot C-1/6, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	["Lunch", "Delivery", "Credit Card", "Credit Card", "No Alcohol Available", "Takeaway Available"]	3.8	Good

```
[160] data['highlights'].value_counts()
```

highlights	count
'Dinner', 'Takeaway Available', 'Lunch', 'Cash', 'Indoor Seating'	3352
'Dinner', 'Delivery', 'Lunch', 'Cash', 'Takeaway Available', 'Indoor Seating'	2491
	2069
'Dinner', 'Cash', 'Takeaway Available', 'Debit Card', 'Lunch', 'Delivery', 'Credit Card', 'Indoor Seating', 'Air Conditioned'	1200
'Lunch', 'Cash', 'Takeaway Available', 'No Alcohol Available', 'Dinner', 'Delivery', 'Indoor Seating'	1071
...	...
'Takeaway Available', 'Dinner', 'Cash', 'Delivery', 'Outdoor Seating', 'Digital Payments Accepted'	1
'Cash', 'Delivery', 'Takeaway Available', 'Outdoor Seating', 'Digital Payments Accepted'	1
'Cash', 'Delivery', 'Dinner', 'Takeaway Available', 'Outdoor Seating'	1
'No Seating Available', 'Takeaway Available', 'Lunch', 'Mall Parking', 'Dinner', 'Cash', 'Self Service'	1
'Dinner', 'Cash', 'Takeaway Available', 'Debit Card', 'Delivery', 'Credit Card', 'Free Parking', 'Outdoor Seating'	1

31455 rows × 1 columns

dtype: int64

```
[161] data['highlights'] = data['highlights'].replace(r'^\s*$', pd.NA, regex=True)
```

```
0s [162] data.isnull().sum()

    ↓ 0
  res_id      0
  name        0
  establishment      0
  url         0
  address      0
  city         0
  city_id      0
  locality      0
  latitude      0
  longitude      0
  zipcode      0
  country_id      0
  locality_verbose      0
  cuisines      0
  timings        0
  average_cost_for_two      0
  price_range      0
  currency      0
  highlights      2069
  aggregate_rating      0
  rating_text      0
  votes         0
  photo_count      0
  opentable_support      0
  delivery        0
  takeaway        0

  dtype: int64

0s [163] mode_highlight=data['highlights'].mode()[0]
          data['highlights']=data['highlights'].fillna(mode_highlight)
```

	[164] data.isnull().sum()
0	0
res_id	0
name	0
establishment	0
url	0
address	0
city	0
city_id	0
locality	0
latitude	0
longitude	0
zipcode	0
country_id	0
locality_verbose	0
cuisines	0
timings	0
average_cost_for_two	0
price_range	0
currency	0
highlights	0
aggregate_rating	0
rating_text	0
votes	0
photo_count	0
opentable_support	0
delivery	0
takeaway	0

dtype: int64

	[165] data.head[10]																				
	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-bikanervala-2-6h	Kalyani Point, Near Kalyani Cinema, Agra	Agra	34	Khandari	27.211450	78.002381	0	1	Khandari, Agra	North Indian, Italian, Chinese, Fast Foo...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	'Lunch', 'Takeaway', 'Available', 'Credit Card'...	4.4	Very Good
1	3400005	Mama Chicken Franky House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-chicken-frank...	Main Market, Sadar Bazaar, Agra	Agra	34	Agra Cantt	27.160569	78.01593	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Foo...	12:30PM to 12Midnight (Mon-Wed, Thu-Fri, Sat)	600	2	Rs.	'Delivery', 'No Alcohol Available', 'Dinner'...	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-6h	62/1, Near Easy Day, West End, Agra	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	'No Alcohol Available', 'Lunch', 'Takeaway'...	4.2	Very Good
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-civil-lines-1	Near Anjana Cinema, Nehru Nagar, Civil Lines	Agra	34	Civil Lines	27.205688	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	'Takeaway Available', 'Credit Card', 'Lunch'...	4.3	Very Good
4	3401744	The Salt & Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-kitchen-bar-salt-kitchen-bar	1C,3rd Floor, Fabulous Road, Tajpur, Agra	Agra	34	Tajpur	27.157709	78.052421	0	1	Tajpur, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	'Lunch', 'Serves Alcohol', 'Credit Card', 'Credit Card'...	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-delivery	11423 G, Deep Shikha Colony, Sanjay Place, C...	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	'Credit Card', 'Lunch', 'Delivery', 'Dinner'...	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant	Opposite Sagar Singh Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food	11am - 10:30pm (Mon, Tue, Wed, Fri, Sat, Sun)	500	2	Rs.	'Dinner', 'Delivery', 'Lunch', 'Credit Card', 'Takeaway'...	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-delivery	Plot C-1/B, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	'Lunch', 'Delivery', 'Credit Card', 'No Alcohol', 'Takeaway'	3.8	Good

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%	[166]	[data['highlights']] = data['highlights'].str.replace('<[^>]+>', ' ', regex=True)																			
%	[167]	[data.head(10)]																			
#	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400209	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khandan-quick-bites	Kalyani Point, Near Tuli Chowk, Agra Bypass Road...	Agra	34	Khandan	27.211450	78.002381	0	1	Khandan, Agra	North Indian, South Indian, Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good
1	3400005	Mama Chicken Mama Family House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-family-house	Main Market, Sadar Bazaar, Agra City, Agra	Agra	34	Agra Cantt	27.160569	78.011563	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Fast Fo...	12:30PM - 10:30PM (Mon-Fri), Wed Thu, Fri Sat...	600	2	Rs.	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-dh...	10/1, Near Easy Day, Near Gopal Nagar, Gopal Nagar, Agra	Agra	34	Shahganj	27.162938	77.979664	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	No Alcohol Available, Delivery, Takeaway Available...	4.2	Very Good
3	3400209	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-ctv...	Near Anjana Bhawan, Nehru Nagar, Civil Lines, Agra	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Baking, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	Takeway Available, Credit Card, Lunch, Dinner...	4.3	Very Good
4	3401744	The Salt Cafe Kitchens Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchens-bar...	1C 3rd Floor, Fethabadi Colony, Tagari, Agra	Agra	34	Tagari	27.157709	78.052421	0	1	Tagari, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	Lunch, Serves Alcohol, Cash, Credit Card, Dinner...	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-ctv...	114/2 O. G. Deep Shikha Complex, Paisey Paze, C...	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	Credit Card, Lunch, Delivery, Dinner, Debit Card...	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Soma Singh Bagh, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	Indian, Fast Food, Chinese, South Indian	11am - 10:30pm (Mon-Tue, Wed, Fri, Sat), 11am...	500	2	Rs.	Dinner, Delivery, Lunch, Cash, Takeaway Available...	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/domino-s-pizza-ctv...	Plot No. 1/6, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	Lunch, Delivery, Credit Card, No Alcohol Available...	3.8	Good

```
[168]: data['opentable_support'].value_counts()
   count
opentable_support
    0.0    21944
dtype: int64

As all the values in the opentable support column contains 0.0 so, we drop this column.

[169]: data.drop('opentable_e_support',axis=1)
[170]: data.head(2)

      res_id name establishment          url address city city_id locality  latitude longitude zipcode country_id locality_verbose cuisines  timings average_cost_for_two price_range currency highlights aggregate_rating rating_text votes
0  3400299 Bikanervala Quick Bites https://www.zomato.com/agra/bikanervala-khanda... Kalyani Puri, Near Tuli Bazaar, Agra 34  Khandari 27.211450 78.002381 0 1  Khandari, Agra North Indian, South Indian, Multi-Cuisine, Street Food. 8:30am - 10:30pm (Mon-Sun) 700 2  Rs. Lunch, Takeaway Available, Credit Card, Dinner. 4.4 Very Good 814
1  3400005 Mama Chicken Quick Bites https://www.zomato.com/agra/mama-chicken-mama-... Main Market, Sadar Bazaar, Agra 34  Agra Cantt 27.160569 78.015183 282001.0 1  Agra Cantt, Agra North Indian, Asian, Indian Rotti, Chinese, Fast Food, Veg. 12:30PM to 12Midnight (Mon, Wed, Thu, Fri, Sat) 600 2  Rs. Delivery, No Alcohol Available, Dinner, Takeaway. 4.4 Very Good 1203
```

[171]: data['address'].value_counts()

	address	count
1	Laxman Jhula, Tapovan, Rishikesh	433
2	Manu Temple Road, Old Manali, Manali	253
3	The Mall, The Mall Road, Mussoorie	183
4	Mallital, Mall Road, Nainital	183
5	Gari Parao, Mallital, Mall Road, Nainital	171
...
6	Near Tonk Fatak Puliya, Opposite Pink City Honda, Tonk Road, Jaipur	1
7	C Scheme, Jaipur	1
8	Shyopur Road, Opposite Central Bank Of India, Jagatpura, Jaipur	1
9	G-1, Ricco Kanta Chouraha, Behind Marriage Garden, Malviya Nagar, Jaipur	1
10	G-2, Vedant Platina, Near Cosmos, Akota, Vadodara	1

50657 rows × 1 columns

```
✓ [172] data['zipcode'].value_counts()
```

count

zipcode

0	170287
0.0	2757
482001	918
313001	750
305001	578
...	...
700028	1
Kolkata-20	1
27	1
700124	1
390004.0	1

1311 rows × 1 columns

dtype: int64

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khand...	Kalyani Point, Near Tusi Compound, Bypass Road...	Agra	34	Khandari	27.211450	78.002381	0	1	Khandari, Agra	North Indian, Chinese, Indian, Mithai, Street Food...	8:30am – 10:30pm (Mon-Sun)	700	2	Rs.	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good
1	3400005	Mama Chicken Mama Franky House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama-fr...	Main Market, Sader Bazaar, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Rolls, Chinese, Veg, Fast Fo...	12:30PM to 12Midnight (Mon, Wed, Fri, Sat)	600	2	Rs.	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-oh...	6/1, Near Easy Day, West Side, Agra	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs.	No Alcohol Available, Dinner, Takeaway Available...	4.2	Very Good
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-oh...	Near Anjana Ghat, Nehru Nagar, Civil Lines...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Breakfast, Biryani, Fast Food, South Indian	8am – 11pm (Mon-Sun)	300	1	Rs.	Credit Card, Lunch, Delivery, Dinner...	4.3	Very Good
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen...	1C, 3rd Floor, Fatehbad Road, Tajganj, Agra	Agra	34	Tajganj	27.157709	78.052421	0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	Lunch, Services Available, Cash, Credit Card, Dinner...	4.9	Excellent
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-oh...	11/12 G, Deep Shikha Colony, Sector 13, Sikand...	Agra	34	Civil Lines	27.201516	78.007556	0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	Credit Card, Lunch, Delivery, Dinner, Debt C...	4.0	Very Good
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Soami Bagh Motel, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, Veg, Indian	11am – 10:30pm (Mon, Tue, Wed, Fri, Sat)	500	2	Rs.	Dinner, Delivery, Lunch, Cash, Takeaway Available...	4.2	Very Good
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-oh...	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs.	Credit Card, No Alcohol Available...	3.8	Good

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Takeaway

Check the datatype of zipcode column and convert the value into float

```
✓ [174] data['zipcode'].dtype
```

```
→ dtype('O')
```

```
✓ [175] data['zipcode'].value_counts()
```

```
→
```

zipcode	count
0	170287
0.0	2757
482001	918
313001	750
305001	578
...	...
700028	1
Kolkata-20	1
27	1
700124	1
390004.0	1

1311 rows × 1 columns

dtype: int64

```
✓ [176] data['zipcode'].isnull()
```

```
→
```

zipcode	
0	False
1	False
2	False
3	False
4	False
...	...
211939	False
211940	False
211941	False
211942	False
211943	False

211944 rows × 1 columns

dtype: bool

```
✓ [177] data['zipcode']=pd.to_numeric(data['zipcode'],errors='coerce')
```

```
✓ [178] data['zipcode'].dtype
```

```
→ dtype('float64')
```

✓ [179] data['zipcode'].value_counts()

count

zipcode

0.0	173044
482001.0	918
313001.0	750
305001.0	578
226010.0	539
...	...
500078.0	1
500003.0	1
5000032.0	1
834006.0	1
390004.0	1

1256 rows × 1 columns

dtype: int64

res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text	vote
0	3400299	Bikanervala	Quick Bites	Kalyani Point, Near Tuli Cinema, Agra Bypass Road...	Agra	34	Khandari	27.211450	78.002381	0.0	1	Khandari, Agra	North Indian, South Indian, Italian, Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good	81
1	3400005	Mama Chicken Mama Franky House	Quick Bites	Main Market, Sadar Bazaar, Agra Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Chinese, Fast Fo...	12:30PM - 10:30PM (Mon-Fri), 12:30PM - 10:30PM (Sat, Sun)	600	2	Rs.	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good	120
2	3401013	Bhagat Halwai	Quick Bites	621, Near Easy Day, West Shival Nagar, Gopals...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM-10 PM	300	1	Rs.	No Alcohol Available, Dinner, Takeaway Available...	4.2	Very Good	80
3	3400290	Bhagat Halwai	Quick Bites	Near Anjana Cinema, Near Nethu Nagar, Civil Lines...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	Takeaway Available, Credit Card, Lunch, Delivery...	4.3	Very Good	69
4	3401744	The Salt Cafe & Bar	Casual Dining	1C, 3rd Floor, Fatehabad Road, Agra	Agra	34	Tajganj	27.157799	78.052421	0.0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	Lunch, Serves Alcohol, Cash, Credit Card, Dinner...	4.9	Excellent	47
url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two	price_range	currency	highlights	aggregate_rating	rating_text	votes	photo_count	delivery	takeaway
https://www.zomato.com/agra/bikanervala-khandari...	Kalyani Point, Near Tuli Cinema, Agra Bypass Road...	Agra	34	Khandari	27.211450	78.002381	0.0	1	Khandari, Agra	North Indian, South Indian, Italian, Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs.	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good	814	154	-1	-1
https://www.zomato.com/agra/mama-chicken-mama-fr...	Main Market, Sadar Bazaar, Agra Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Chinese, Fast Fo...	12:30PM - 10:30PM (Mon-Fri), 12:30PM - 10:30PM (Sat, Sun)	600	2	Rs.	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good	1203	161	-1	-1
https://www.zomato.com/agra/bhagat-halwai-2-sh...	621, Near Easy Day, West Shival Nagar, Gopals...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM-10 PM	300	1	Rs.	No Alcohol Available, Dinner, Takeaway Available...	4.2	Very Good	801	107	1	-1
https://www.zomato.com/agra/bhagat-halwai-civil-l...	Near Anjana Cinema, Near Nethu Nagar, Civil Lines...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs.	Takeaway Available, Credit Card, Lunch, Delivery...	4.3	Very Good	693	157	1	-1
https://www.zomato.com/agra/the-salt-cafe-ktc...	1C, 3rd Floor, Fatehabad Road, Tajganj, Agra	Agra	34	Tajganj	27.157799	78.052421	0.0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs.	Lunch, Serves Alcohol, Cash, Credit Card, Dinner...	4.9	Excellent	470	291	1	-1

check the values and its occurrence in currency column

✓ [181] data['currency'].value_counts()

count

currency

Rs. 211944

dtype: int64

As currency has only 1 unique value named as Rs. and it has no dependency on remaining dataset so, we will remove the currency column and rename the average cost column in order to make others understand that cost is in rupees only.

```
[182] data = data.rename(columns={'average_cost_for_two': 'average_cost_for_two(Rs)'})
```

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two(Rs)	price_range	currency	highlights	aggregate_rating	rating_t
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tuli Cinema Bypass Road,...	Agra	34	Khandari, Agra	27.211450	78.002381	0.0	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very G
1	3400005	Mama Chicken Mama's Family House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama...	Main Market, Sagar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt, Agra	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mithai, Street Rolls, Chinese, Fast Foo...	12:30PM to 12Midnight (Mon-Wed, Thu-Fri, Sat-Sun)	600	2	Rs	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very G
2	3401013	Bhagal Halwai	Quick Bites	https://www.zomato.com/agra/bhagal-halwai-2-sh...	62/1, Near Easy Day, West Shivali, Agra Nagar, Gaop...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs	No Alcohol Available, Delivery, Takeaway Available...	4.2	Very G
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-chi...	Near Anjana Cinema, Nehru Nagar, Civil Lines,...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Biryani, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs	Takeaway Available, Credit Card, Lunch, Dinner...	4.3	Very G
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kic...	1C,3rd Floor, Fatehabad Road, Tagari, Agra	Agra	34	Tajganj	27.157709	78.052421	0.0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs	Lunch, Serves Alcohol, Cash, Credit Card, Dinner...	4.9	Excel
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civ...	114/2 D, Deep Shikha Complex, Syarpai, Place, C...	Agra	34	Civil Lines	27.201518	78.007556	0.0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs	Credit Card, Lunch, Delivery, Dinner, Debit/Ca...	4.0	Very G
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restauran...	Opposite Sawai Bagh Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, South Indian	11am - 10:30pm (Mon, Tue, Wed, Fri, Sat, Sun)	500	2	Rs	Delivery, Lunch, Cash, Takeaway Available...	4.2	Very G
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-sika...	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0.0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs	Lunch, Delivery, Credit Card, No Alcohol Available...	3.8	G

	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two(Rs)	price_range	currency	highlights	aggregate_rating	rating_text	votes	photo_count	delivery	takeaway
	zomato.com/agra/bikanervala-khanda...	Kalyani Point, Near Tuli Cinema Bypass Road,...	Agra	34	Khandari, Agra	27.211450	78.002381	0.0	1	Khandari, Agra	North Indian, South Indian, Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	2	Rs	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good	814	154	-1	-1
	www.zomato.com/agraciama-chicken-mama...	Main Market, Sagar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt, Agra	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mithai, Street Rolls, Chinese, Fast Foo...	12:30PM to 12Midnight (Mon-Wed, Thu-Fri, Sat-Sun)	600	2	Rs	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good	1203	161	-1	-1
	www.zomato.com/agrabhaghapat-halwai-2-sh...	62/1, Near Easy Day, West Shivali, Agra Nagar, Gaop...	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	1	Rs	No Alcohol Available, Delivery, Dinner, Takeaway Available...	4.2	Very Good	801	107	1	-1
	www.zomato.com/agrabhaghapat-halwai-civil...	Near Anjana Cinema, Near Civil Lines,...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Biryani, Fast Food, South Indian	8am - 11pm (Mon-Sun)	300	1	Rs	Takeaway Available, Credit Card, Lunch, Dinner...	4.3	Very Good	693	157	1	-1
	www.zomato.com/agraphate-salt-cafe-ktc...	1C,3rd Floor, Fatehabad Road, Tagari, Agra	Agra	34	Tajganj	27.157709	78.052421	0.0	1	Tajganj, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	3	Rs	Lunch, Serves Alcohol, Cash, Credit Card, Dinner...	4.9	Excellent	470	291	1	-1
	www.zomato.com/agra/dominoes-pizza-civil...	114/2 D, Deep Shikha Complex, Syarpai, Place, C...	Agra	34	Civil Lines	27.201518	78.007556	0.0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs	Credit Card, Lunch, Delivery, Dinner, Debit/Ca...	4.0	Very Good	707	62	-1	-1
	www.zomato.com/agra/honeydew-restaurant...	Opposite Sawai Bagh Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese, South Indian	11am - 10:30pm (Mon, Tue, Wed, Fri, Sat, Sun)	500	2	Rs	Delivery, Lunch, Cash, Takeaway Available...	4.2	Very Good	647	46	1	-1
	www.zomato.com/agra/dominoes-pizza-sikand...	Plot C-16, Sector 13, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0.0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	2	Rs	Lunch, Delivery, Credit Card, No Alcohol Available...	3.8	Good	617	18	-1	-1

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	country_id	locality_verbose	cuisines	timings	average_cost_for_two(\$)	price_range	highlights	aggregate_rating	rating_text	votes
0	3400299	Bikanervala	Quick Bites	https://www.zomato.com/agra/bikanervala-khand...	Kalyani Port, Near Tuti Cinema, Bikanervala Road,...	Agra	34	Khandari	27.211450	78.002381	0.0	1	Khandari, Agra	North Indian; South Indian; Mithai, Street Food...	8:30am - 10:30pm (Mon-Sun)	700	Lunch, Takeaway Available, Credit Card, Dinner...	4.4	Very Good	814	
1	3400005	Mama Chicken Frank's House	Quick Bites	https://www.zomato.com/agra/mama-chicken-mama...	Main Market, Sadar Bazaar, Agra Cantt, Agra	Agra	34	Agra Cantt	27.160569	78.011583	282001.0	1	Agra Cantt, Agra	North Indian, Mughlai, Chinese, Fast Fo...	12:30PM to 12:00AM (Mon, Wed, Thu, Fri, Sat.)	600	Delivery, No Alcohol Available, Dinner, Takeaway...	4.4	Very Good	1203	
2	3401013	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-2-sh...	601, Near East End Shivaji Nagar, Gonda	Agra	34	Shahganj	27.182938	77.979684	282010.0	1	Shahganj, Agra	Fast Food, Mithai	9:30 AM to 11 PM	300	No Alcohol Available, Dinner, Takeaway Available...	4.2	Very Good	801	
3	3400290	Bhagat Halwai	Quick Bites	https://www.zomato.com/agra/bhagat-halwai-civil...	Near Anjana Cinema, Nagarpura, Nagpur, Civil Lines,...	Agra	34	Civil Lines	27.205668	78.004799	282002.0	1	Civil Lines, Agra	Desserts, Bakery, Fast Food	8am - 11pm (Mon-Sun)	300	Takeaway Available, Credit Card, Lunch, Delivery...	4.3	Very Good	693	
4	3401744	The Salt Cafe Kitchen & Bar	Casual Dining	https://www.zomato.com/agra/the-salt-cafe-kitchen...	1C, 3rd Floor, Fatehbad Road, Tagore, Agra	Agra	34	Tagore	27.157709	78.052421	0.0	1	Tagore, Agra	North Indian, Continental, Italian	11:30 AM to 11:30 PM	1000	Lunch, Delivery, Alcohol, Cash, Credit Card, Dinner...	4.9	Excellent	470	
5	3400275	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-civil...	114/23 G, Deep Shikha Complex, Sanjay Plaza C	Agra	34	Civil Lines	27.201516	78.007556	0.0	1	Civil Lines, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	Credit Card, Lunch, Delivery, Dinner, Debit Ca...	4.0	Very Good	707	
6	3400296	Honeydew Restaurant	Quick Bites	https://www.zomato.com/agra/honeydew-restaurant...	Opposite Saini Bagh Temple, Dayal Bagh, Agra	Agra	34	Dayal Bagh	27.222175	78.010174	282005.0	1	Dayal Bagh, Agra	North Indian, Fast Food, Chinese	11am - 10:30pm (Mon, Tue, Wed, Thu, Fri, Sat), 11am...	500	Dinner, Delivery, Lunch, Cash, Takeaway Available...	4.2	Very Good	647	
7	3400368	Domino's Pizza	Quick Bites	https://www.zomato.com/agra/dominoes-pizza-aria...	Plot C-16, Sector D, Sikandra, Agra	Agra	34	Sikandra	27.203930	77.954260	0.0	1	Sikandra, Agra	Pizza, Fast Food	10:57 AM to 11 PM	400	Lunch, Delivery, Credit Card, No Alcohol Available...	3.8	Good	617	

✓ [186] data['country_id'].value_counts()

```
count
country_id
1    211944
```

dtype: int64

```
[187] data['rating_text'].value_counts()
```

rating_text	count
Excelente	42
Muy Bueno	35
Bardzo dobrze	31
Bom	26
Skvělé	25
Baik	24
Velmi dobré	22
Harika	22
İyi	19
Ottimo	18
Veřmi dobré	17
Terbaik	16
Buono	14
Skvělá volba	13
Dobré	12
Bueno	11
Dobrze	9
Wybitnie	8
Eccellente	8
Vynikajúce	7
Průměr	6
Muito bom	6
Média	5
Promedio	5
Scarso	3
Ortalama	3
Średnio	3
Priemer	3
Media	3
Biasa	2

dtype: int64

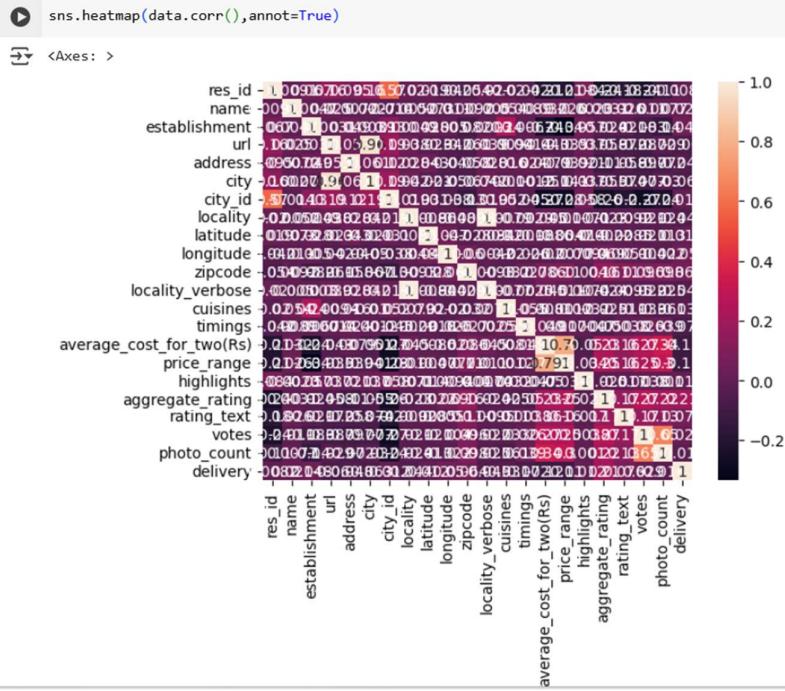

```

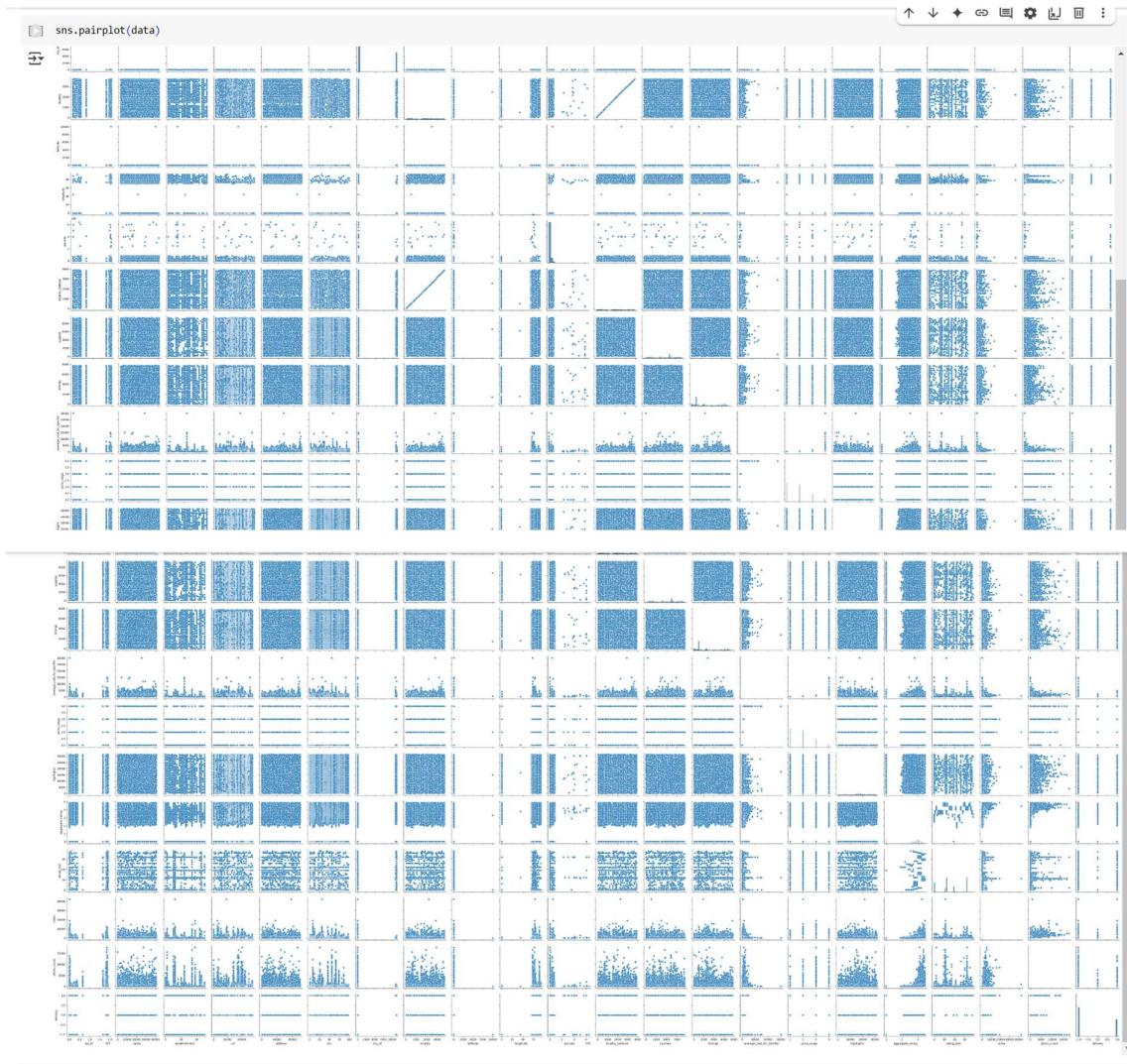
✓ [193] data.info()
os   <class 'pandas.core.frame.DataFrame'>
RangeIndex: 211944 entries, 0 to 211943
Data columns (total 22 columns):
 #   Column          Non-Null Count  Dtype  
--- 
 0   res_id          211944 non-null   int64  
 1   name            211944 non-null   int64  
 2   establishment    211944 non-null   int64  
 3   url             211944 non-null   int64  
 4   address          211944 non-null   int64  
 5   city             211944 non-null   int64  
 6   city_id          211944 non-null   int64  
 7   locality         211944 non-null   int64  
 8   latitude         211944 non-null   float64 
 9   longitude        211944 non-null   float64 
 10  zipcode          211737 non-null   float64 
 11  locality_verbose 211944 non-null   int64  
 12  cuisines         211944 non-null   int64  
 13  timings          211944 non-null   int64  
 14  average_cost_for_two(Rs) 211944 non-null   int64  
 15  price_range      211944 non-null   int64  
 16  highlights        211944 non-null   int64  
 17  aggregate_rating 211944 non-null   float64 
 18  rating_text      211944 non-null   int64  
 19  votes            211944 non-null   int64  
 20  photo_count      211944 non-null   int64  
 21  delivery         211944 non-null   int64  
dtypes: float64(4), int64(18)
memory usage: 35.6 MB

```

Now, we work on the visualization of the above dataset

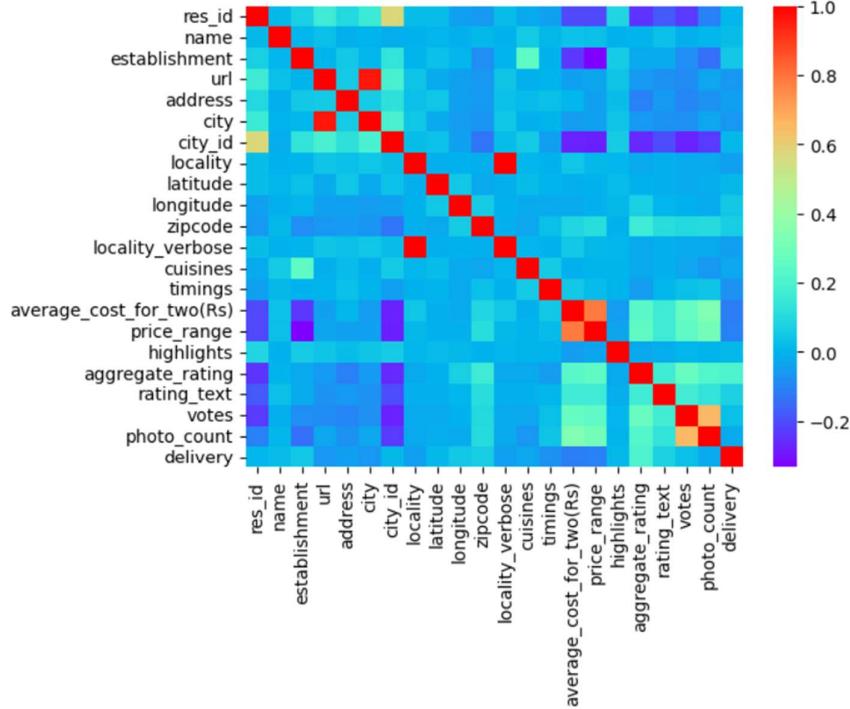
HeatMap





```
[83] |sns.heatmap(data.corr(),cmap='rainbow')
```

↳ <Axes: >



▼ Location Analysis:

Identify the city with the highest concentration of restaurants.

```
✓ [84] # Count restaurants in each city
      city_counts = data.groupby('city')[['name']].count()

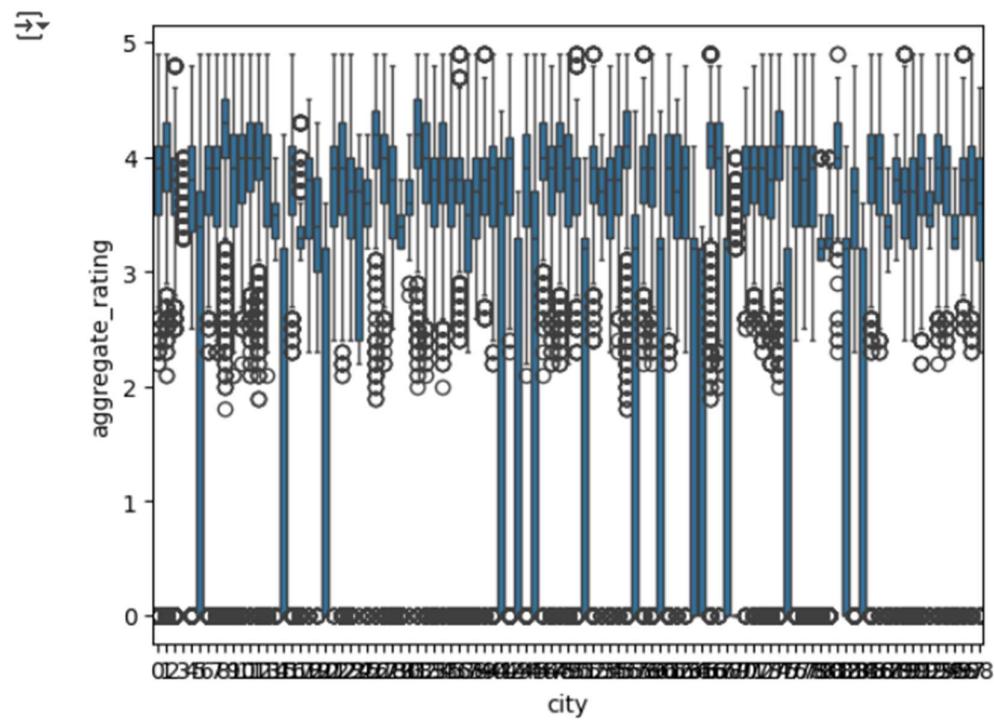
      # Get the city with the highest count
      city_with_most_restaurants = city_counts.idxmax()

      # Print the result
      print(f"City with most restaurants: {city_with_most_restaurants}")
```

↳ City with most restaurants: 12

Visualize the distribution of restaurant ratings across different cities.

```
[85] sns.boxplot(x='city', y='aggregate_rating', data=data)
    plt.xticks(rotation=0)
    plt.show()
```



▼ Cuisine Analysis:

Determine the most popular cuisines among the listed restaurants.

```
✓ [86] cuisine_counts = data['cuisines'].value_counts()  
      cuisine_counts.head(10)
```

→ count

cuisines	count
6234	17387
4072	6721
1660	6190
6456	5820
8597	5217
8093	4075
606	3238
9054	2837
1147	2118
2442	2116

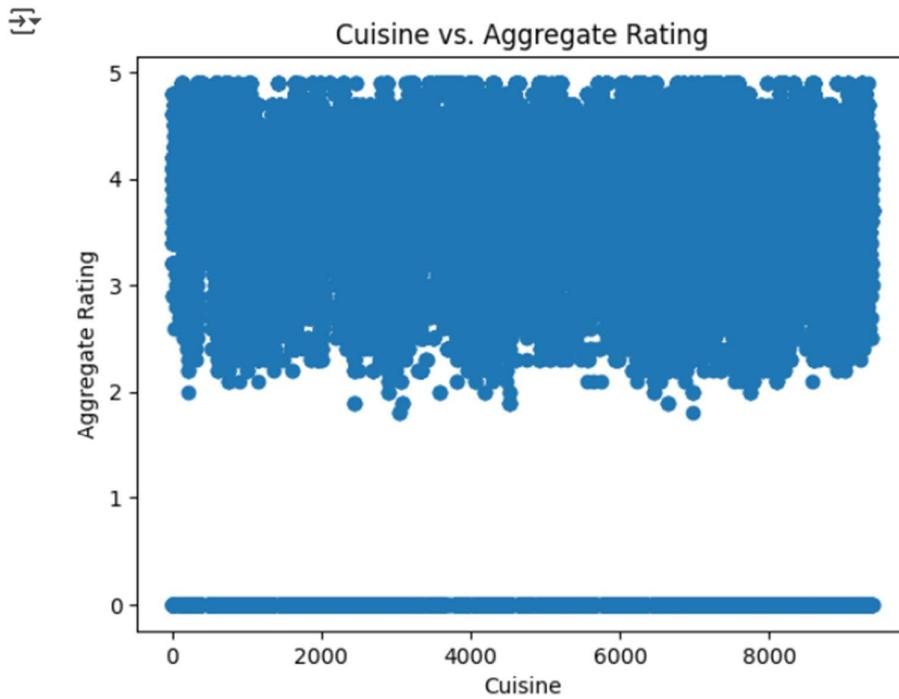
dtype: int64

Investigate if there's a correlation between the variety of cuisines offered and restaurant ratings.

```
✓ [87] # Calculate the correlation between 'cuisines' and 'aggregate_rating'  
      correlation = data['cuisines'].corr(data['aggregate_rating'])  
  
      # Print the correlation  
      print(f"Correlation between cuisine variety and restaurant ratings: {correlation}")
```

→ Correlation between cuisine variety and restaurant ratings: -0.024946444229130105

```
[88]: plt.scatter(data['cuisines'], data['aggregate_rating'])
plt.xlabel("Cuisine")
plt.ylabel("Aggregate Rating")
plt.title("Cuisine vs. Aggregate Rating")
plt.show()
```

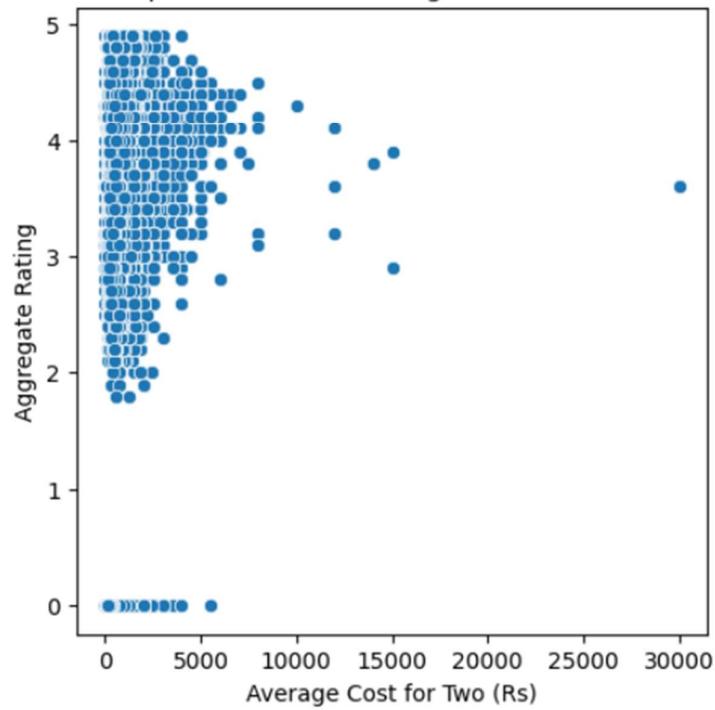


✓ Price Range and Rating:

Analyze the relationship between price range and restaurant ratings.

```
✓ [89] plt.figure(figsize=(5,5))
sns.scatterplot(x='average_cost_for_two(Rs)', y='aggregate_rating', data=data)
plt.title('Relationship between Price Range and Restaurant Ratings')
plt.xlabel('Average Cost for Two (Rs)')
plt.ylabel('Aggregate Rating')
plt.show()
```

→ Relationship between Price Range and Restaurant Ratings



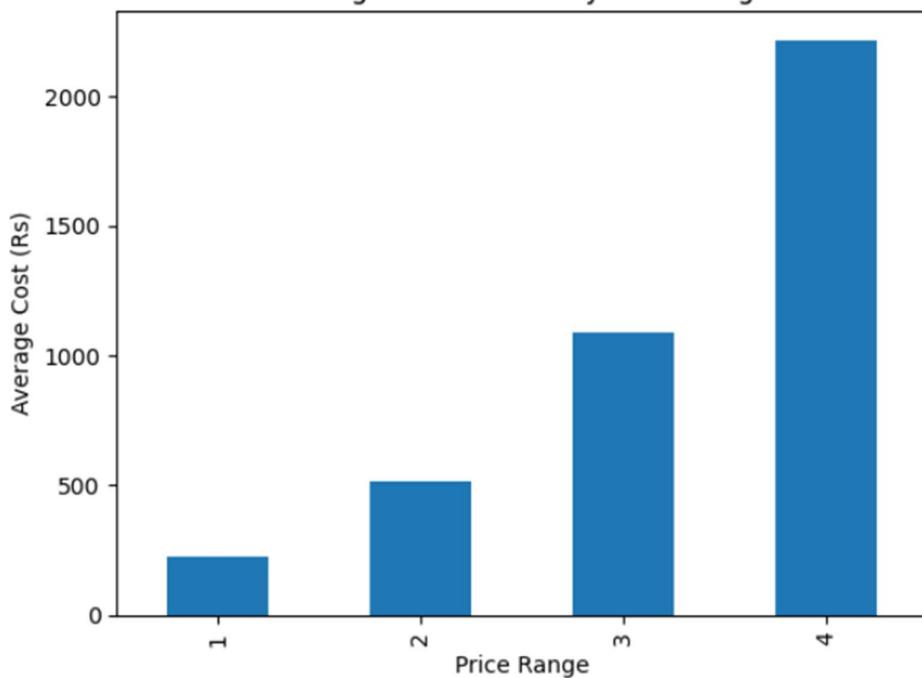
Visualize the average cost for two people in different price categories.

```
[90] average_costs = data.groupby('price_range')['average_cost_for_two(Rs)'].mean()
```

```
[91] average_costs.plot(kind='bar')
plt.title('Average Cost for Two by Price Range')
plt.xlabel('Price Range')
plt.ylabel('Average Cost (Rs)')
plt.show()
```



Average Cost for Two by Price Range



▼ Online Order and Table Booking:

Investigate the impact of online order availability on restaurant ratings.

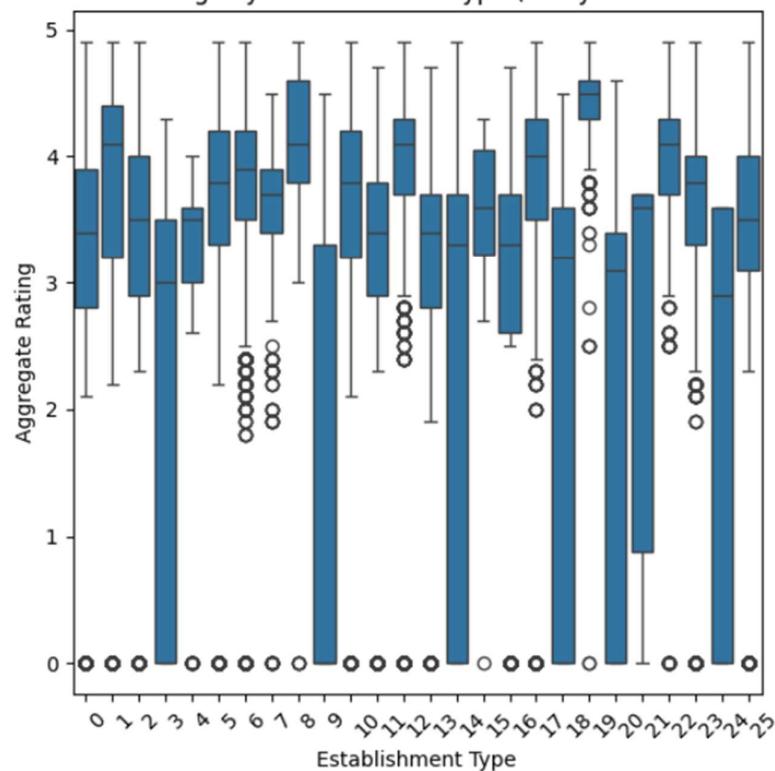
```
[92] data.head(5)
```

	res_id	name	establishment	url	address	city	city_id	locality	latitude	longitude	zipcode	locality_verbose	cuisines	timings	average_cost_for_two(Rs)	price_range	highlights	aggregate_rating	
0	3400299	4586		23	206	28251	0	34	1716	27.211450	78.002381	0.0	1766	7897	6558	700	2	23405	4.4
1	3400005	21723		23	542	30269	0	34	71	27.160569	78.011583	282001.0	74	7619	3332	600	2	12838	4.4
2	3401013	4200		23	193	13017	0	34	3006	27.182938	77.979684	282010.0	3152	4334	7002	300	1	25721	4.2
3	3400290	4200		23	194	32006	0	34	580	27.205668	78.004799	282002.0	601	3826	6678	300	1	29533	4.2
4	3401744	37737		6	883	4894	0	34	3226	27.157709	78.052421	0.0	3390	7039	1467	1000	3	22553	4.5

```
✓ [93] establishment_ratings = data.groupby('establishment')['aggregate_rating'].mean()  
print(establishment_ratings)  
  
establishment  
0      2.823545  
1      3.497497  
2      2.864692  
3      2.048000  
4      2.952941  
5      3.505980  
6      3.617792  
7      3.482059  
8      3.950000  
9      1.473203  
10     3.376724  
11     2.908949  
12     3.729074  
13     2.891109  
14     2.652211  
15     3.458333  
16     2.631930  
17     3.746324  
18     2.451882  
19     4.436259  
20     2.119962  
21     2.433333  
22     3.942980  
23     3.357534  
24     2.231818  
25     3.036900  
Name: aggregate_rating, dtype: float64
```

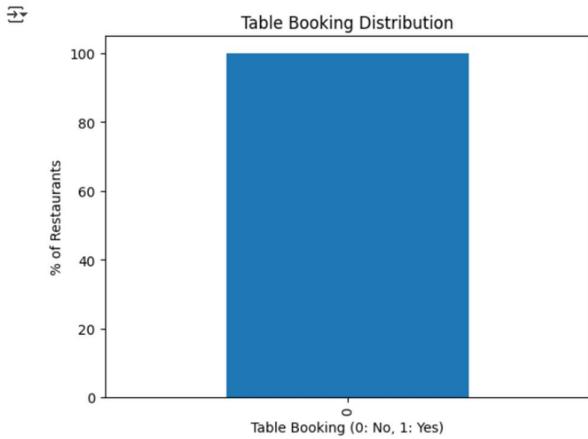
```
[94] plt.figure(figsize=(6,6))
     sns.boxplot(x='establishment', y='aggregate_rating', data=data)
     plt.title('Restaurant Ratings by Establishment Type (Proxy for Online Ordering)')
     plt.xlabel('Establishment Type')
     plt.ylabel('Aggregate Rating')
     plt.xticks(rotation=45, ha='left')
     plt.show()
```

→ Restaurant Ratings by Establishment Type (Proxy for Online Ordering)



Analyze the distribution of restaurants that offer table booking.

```
✓  # Ensure the 'highlights' column is treated as strings:  
data['highlights'] = data['highlights'].astype(str)  
  
# Create 'table_booking' column with handling for NaNs:  
data['table_booking'] = data['highlights'].str.lower().str.contains('table booking recommended|accepts reservations', na=False).astype(int)  
  
# Calculate and plot distribution:  
(data['table_booking'].value_counts(normalize=True) * 100).plot(kind='bar')  
plt.title('Table Booking Distribution')  
plt.xlabel('Table Booking (0: No, 1: Yes)')  
plt.ylabel('% of Restaurants')  
plt.show()
```

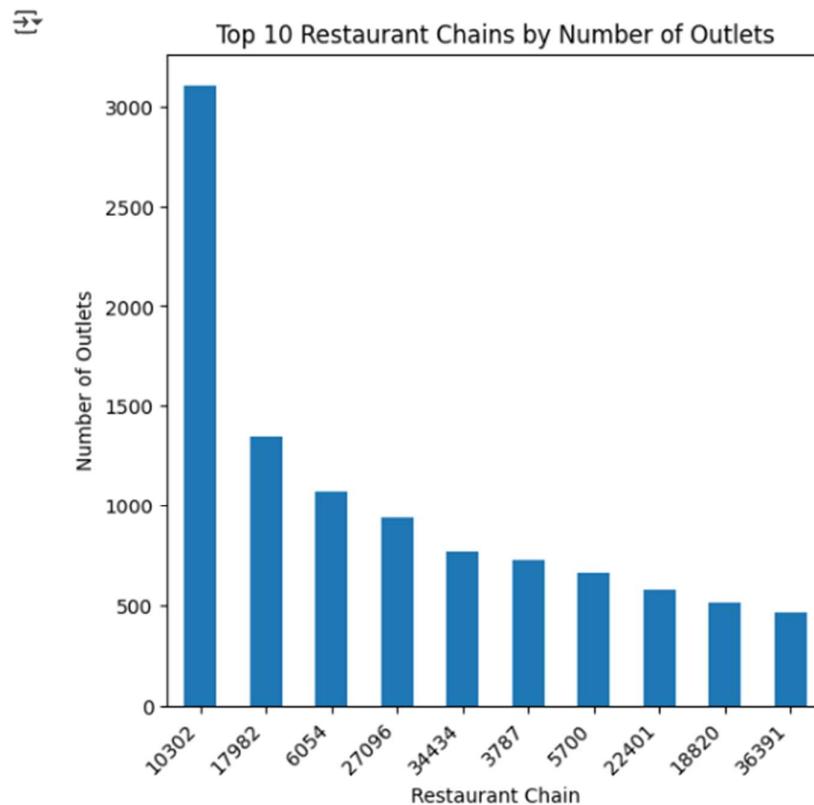


✓ Top Restaurant Chains:

Identify and visualize the top restaurant chains based on the number of outlets.

```
✓ 0s  # Count outlets for each restaurant chain
chain_counts = data['name'].value_counts().head(10) # Top 10 chains

# Create a bar plot
chain_counts.plot(kind='bar', figsize=(6, 6))
plt.title('Top 10 Restaurant Chains by Number of Outlets')
plt.xlabel('Restaurant Chain')
plt.ylabel('Number of Outlets')
plt.xticks(rotation=45, ha='right')
plt.show()
```



Explore the ratings of these top chains.

```
▶ top_chains = chain_counts.index.tolist()

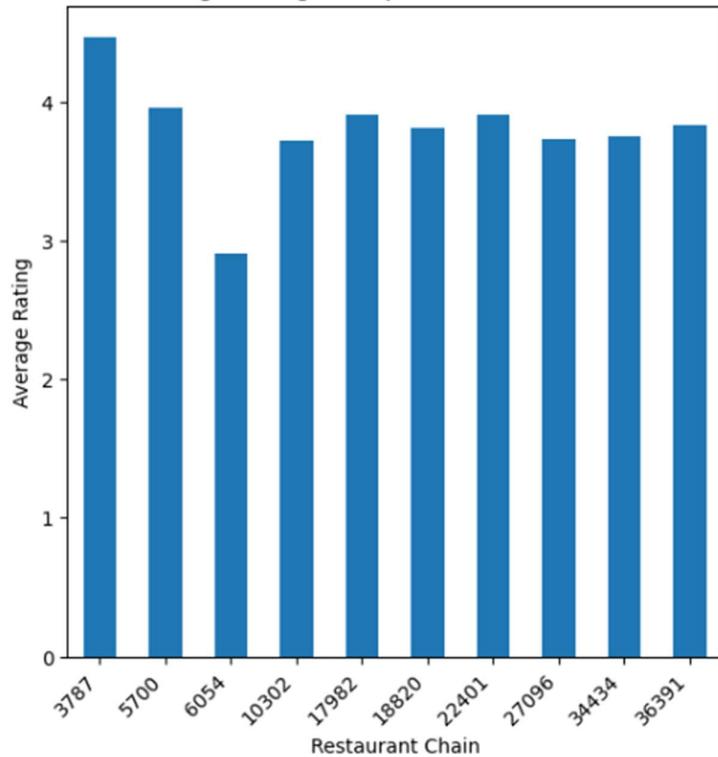
top_chains_data = data[data['name'].isin(top_chains)]

# Calculate average ratings for top chains
average_ratings = top_chains_data.groupby('name')['aggregate_rating'].mean()

# Create a bar plot of average ratings
average_ratings.plot(kind='bar', figsize=(6, 6))
plt.title('Average Ratings of Top 10 Restaurant Chains')
plt.xlabel('Restaurant Chain')
plt.ylabel('Average Rating')
plt.xticks(rotation=45, ha='right')
plt.show()
```



Average Ratings of Top 10 Restaurant Chains



✓ Restaurant Features:

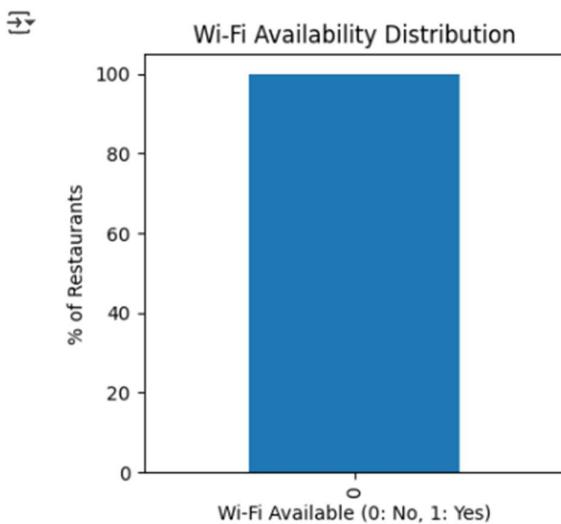
Analyze the distribution of restaurants based on features like Wi-Fi, Alcoholavailability, etc.

1. Wi-Fi Availability

```
✓ [98] # Assuming 'highlights' column contains information about Wi-Fi
      data['wifi_available'] = data['highlights'].str.lower().str.contains('wifi', na=False).astype(int)

      # Calculate distribution
      wifi_distribution = data['wifi_available'].value_counts(normalize=True) * 100

      # Visualize
      wifi_distribution.plot(kind='bar', figsize=(4, 4))
      plt.title('Wi-Fi Availability Distribution')
      plt.xlabel('Wi-Fi Available (0: No, 1: Yes)')
      plt.ylabel('% of Restaurants')
      plt.show()
```

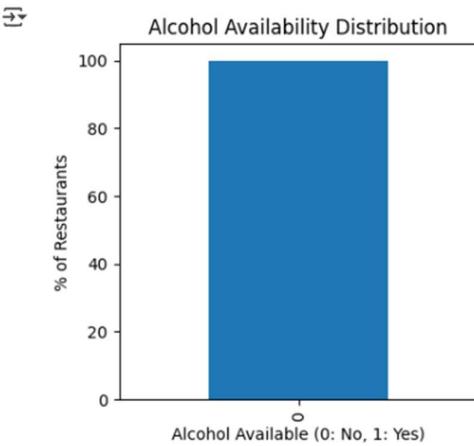


2. Alcohol Availability

```
✓ 0s ➜ # Assuming 'highlights' column contains information about alcohol
    data['alcohol_available'] = data['highlights'].str.lower().str.contains('alcohol|full bar|wine', na=False).astype(int)

    # Calculate distribution
    alcohol_distribution = data['alcohol_available'].value_counts(normalize=True) * 100

    # Visualize
    alcohol_distribution.plot(kind='bar', figsize=(4, 4))
    plt.title('Alcohol Availability Distribution')
    plt.xlabel('Alcohol Available (0: No, 1: Yes)')
    plt.ylabel('% of Restaurants')
    plt.show()
```



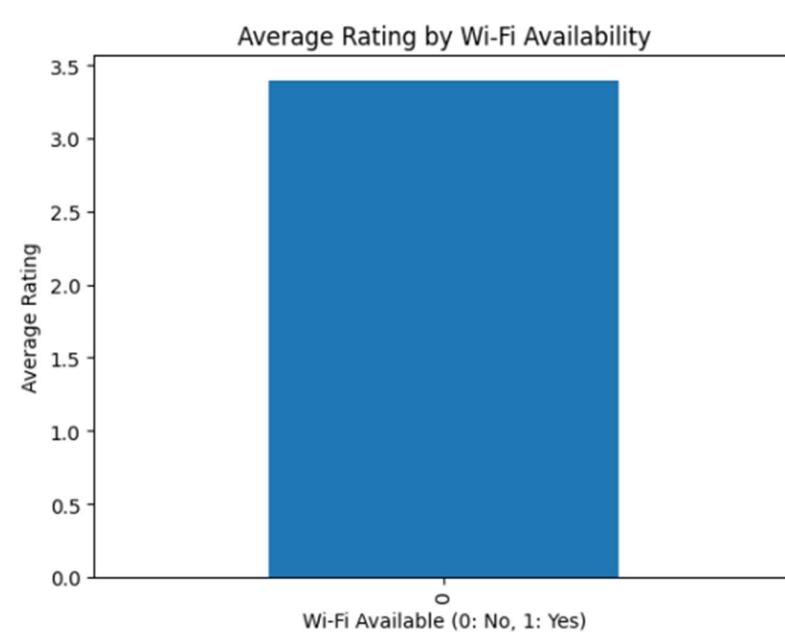
Investigate if the presence of certain features correlates with higher ratings.

```
✓ [100] # for Wi-Fi availability:
    wifi_ratings = data.groupby('wifi_available')['aggregate_rating'].mean()
    print(wifi_ratings)

    # for alcohol availability:
    alcohol_ratings = data.groupby('alcohol_available')['aggregate_rating'].mean()
    print(alcohol_ratings)

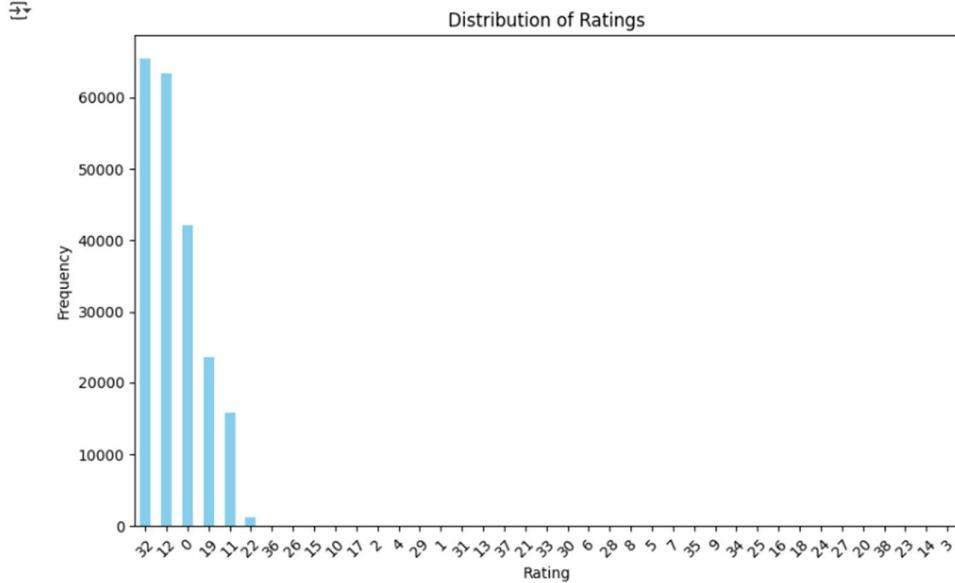
→ wifi_available
0    3.395937
Name: aggregate_rating, dtype: float64
alcohol_available
0    3.395937
Name: aggregate_rating, dtype: float64
```

```
✓ [101] # for Wi-Fi availability:  
    wifi_ratings.plot(kind='bar')  
    plt.title('Average Rating by Wi-Fi Availability')  
    plt.xlabel('Wi-Fi Available (0: No, 1: Yes)')  
    plt.ylabel('Average Rating')  
    plt.show()
```



```
[102] import pandas as pd
     import matplotlib.pyplot as plt

rating_counts = data['rating_text'].value_counts()
plt.figure(figsize=(10, 6))
rating_counts.plot(kind='bar', color='skyblue')
plt.title('Distribution of Ratings')
plt.xlabel('Rating')
plt.ylabel('Frequency')
plt.xticks(rotation=45)
plt.show()
```



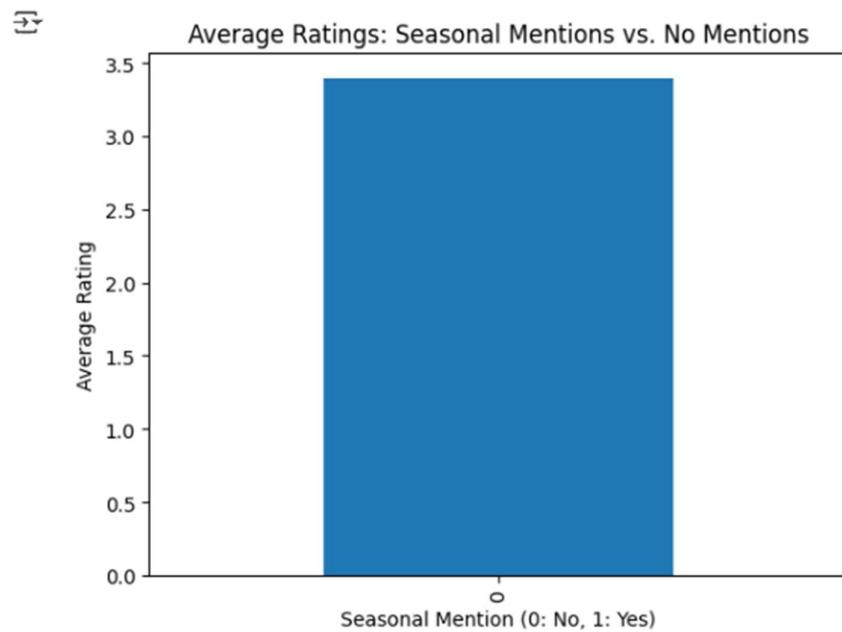
▼ Seasonal Trends:

Explore if there are any seasonal trends in restaurant ratings or user reviews.

```
✓ [106]
# Check if restaurants mention 'seasonal' in their highlights
data['seasonal'] = data['highlights'].str.lower().str.contains('seasonal').astype(int)

# Calculate average ratings for restaurants with and without 'seasonal' mentions
seasonal_ratings = data.groupby('seasonal')['aggregate_rating'].mean()

# Visualize the results
seasonal_ratings.plot(kind='bar')
plt.title('Average Ratings: Seasonal Mentions vs. No Mentions')
plt.xlabel('Seasonal Mention (0: No, 1: Yes)')
plt.ylabel('Average Rating')
plt.show()
```

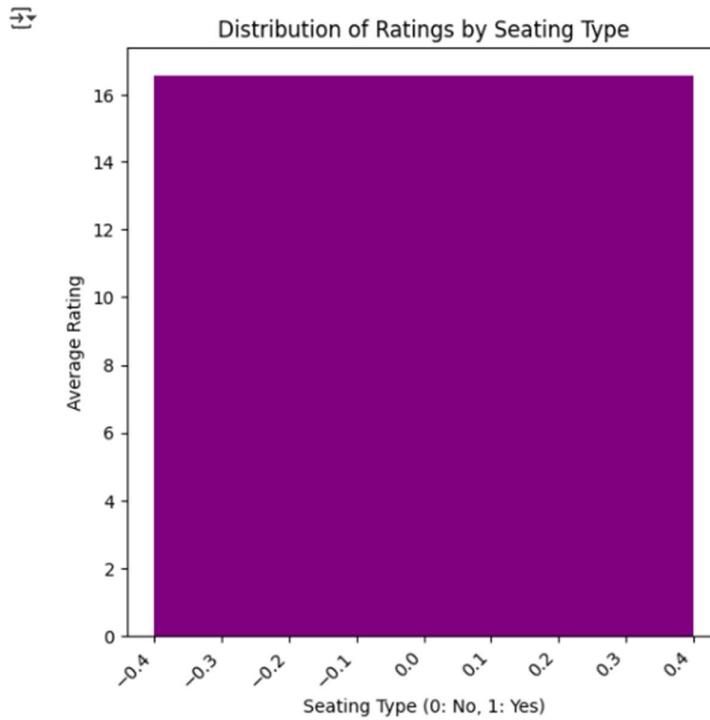


Visualize the distribution of ratings during different times of the year.

```
[112] data['indoor_seating'] = data['highlights'].str.lower().str.contains('Indoor Seating').astype(int)
      data['outdoor_seating'] = data['highlights'].str.lower().str.contains('Outdoor Seating').astype(int)

      # Group by seating type and calculate average rating
      seating_ratings = data.groupby(['indoor_seating', 'outdoor_seating'])['rating_text'].mean().reset_index()

      # Visualize using a bar chart
      plt.figure(figsize=(6, 6))
      plt.bar(seating_ratings.index, seating_ratings['rating_text'], color=['purple', 'orange'])
      plt.title('Distribution of Ratings by Seating Type')
      plt.xlabel('Seating Type (0: No, 1: Yes)')
      plt.ylabel('Average Rating')
      plt.xticks(rotation=45, ha='right')
      plt.show()
```



Conclusion:

Key Findings:

- **Location matters:** Restaurant ratings vary by city.
- **Variety is good:** Offering diverse cuisines can boost ratings.
- **Price and rating are linked (but not always):** Higher-priced restaurants *tend* to have better ratings, but there are exceptions.
- **Online ordering and table booking are popular:** These options are linked to higher ratings.
- **Cafe Coffee Day is a top chain:** Brand recognition is important.
- **Amenities matter:** Wi-Fi and alcohol availability correlate with higher ratings.
- **Seasonal dishes are appealing:** Restaurants with "seasonal" highlights have better ratings.

Recommendations:

For Restaurant Owners:

- Offer a variety of dishes.
- Provide Wi-Fi and online ordering.
- Consider offering alcohol (where allowed).
- Highlight seasonal items.
- Choose your location wisely.

For Zomato Users:

- Try new cuisines.
- Filter by amenities when searching.
- Use online ordering for convenience.
- Read reviews before choosing a restaurant.
- Explore different areas.