

# swiggydataanalysis-1

August 18, 2024

## 1 Importing the Scraped Swiggy Data

```
[394]: # Importing the dataset swiggy_data.csv

import pandas as pd
df = pd.read_csv('/content/swiggy_data.csv')
```

## 2 Reading the Dataset

```
[395]: df.head(10)
```

```
[395]:
```

	restaurant_name \	image_url	rating \	cuisine	location \
0	Chinese Wok	https://media-assets.swiggy.com/swiggy/image/u...	4.4		
1	Five Star Chicken	https://media-assets.swiggy.com/swiggy/image/u...	4.4		
2	Subway	https://media-assets.swiggy.com/swiggy/image/u...	4.3		
3	Pizza Hut	https://media-assets.swiggy.com/swiggy/image/u...	4.1		
4	Nandhana Palace	https://media-assets.swiggy.com/swiggy/image/u...	4.4		
5	Corner House Ice Cream	https://media-assets.swiggy.com/swiggy/image/u...	4.7		
6	Great Indian Khichdi by EatFit	https://media-assets.swiggy.com/swiggy/image/u...	4.6		
7	Dum Safar Biryani	https://media-assets.swiggy.com/swiggy/image/u...	3.9		
8	Grameen Kulfi	https://media-assets.swiggy.com/swiggy/image/u...	4.8		
9	Wow! China	https://media-assets.swiggy.com/swiggy/image/u...	3.9		

```

0           Chinese, Asian, Tibetan, Desserts  Malleshwaram
1                               Burgers           Majestic
2           Salads, Snacks, Desserts, Beverages  Basavanagudi
3                               Pizzas           Basavanagudi
4           Biryani, Andhra, South Indian, North Indian  Rajajinagar
5                               Ice Cream, Desserts  Basavanagudi
6 Home Food, Indian, North Indian, Healthy Food,...  Vasanth Nagar
7           Biryani, Kebabs, Tandoor, Indian, Desserts  RAJAJI NAGAR
8                               Ice Cream, Desserts  Rajajinagar
9 Tibetan, Chinese, Asian, Snacks, Continental, ...  Shantinagar

```

```

    delivery_time
0    40-45 mins
1    25-30 mins
2    20-25 mins
3    25-30 mins
4    35-40 mins
5    20-25 mins
6    30-35 mins
7    40-45 mins
8    30-35 mins
9    30-35 mins

```

```
[396]: df.columns
```

```
[396]: Index(['restaurant_name', 'image_url', 'rating', 'cuisine', 'location',
            'delivery_time'],
            dtype='object')
```

The columns in the dataset are: - *restaurant\_name* - *image\_url* - *rating* - *cuisine* - *location* - *delivery\_time*

### 3 Number of Rows and Columns

```
[397]: df.shape
```

```
[397]: (115798, 6)
```

The dataset consists of **115798** rows and **6** columns.

### 4 Removing Duplicate Rows From the Dataset

```
[398]: # Remove duplicate rows based on 'restaurant_name' and 'location'
df_cleaned = df.drop_duplicates(subset=['restaurant_name', 'location'])

# Save the cleaned DataFrame to a new CSV file
```

```
df_cleaned.to_csv('/content/swiggy_data_cleaned.csv', index=False)
```

## 5 Perform EDA on the Cleaned Swiggy Dataset

```
[399]: import matplotlib.pyplot as plt
import seaborn as sns

# Load the cleaned dataset
df_cleaned = pd.read_csv('/content/swiggy_data_cleaned.csv')

# Display basic information about the dataset
print(df_cleaned.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1838 entries, 0 to 1837
Data columns (total 6 columns):
 #   Column          Non-Null Count  Dtype  
---  -
 0   restaurant_name  1838 non-null   object 
 1   image_url        1836 non-null   object 
 2   rating           1500 non-null   float64
 3   cuisine          1838 non-null   object 
 4   location         1837 non-null   object 
 5   delivery_time    1838 non-null   object 
dtypes: float64(1), object(5)
memory usage: 86.3+ KB
None
```

```
[400]: df_cleaned.shape
```

```
[400]: (1838, 6)
```

After removal of the duplicate rows, now there are **1838 rows**.

```
[401]: # Drop image column

df_cleaned = df_cleaned.drop('image_url', axis=1)
df_cleaned.head()
```

```
[401]:
```

	restaurant_name	rating	cuisine \
0	Chinese Wok	4.4	Chinese, Asian, Tibetan, Desserts
1	Five Star Chicken	4.4	Burgers
2	Subway	4.3	Salads, Snacks, Desserts, Beverages
3	Pizza Hut	4.1	Pizzas
4	Nandhana Palace	4.4	Biryani, Andhra, South Indian, North Indian

	location	delivery_time
0	Malleshwaram	40-45 mins
1	Majestic	25-30 mins
2	Basavanagudi	20-25 mins
3	Basavanagudi	25-30 mins
4	Rajajinagar	35-40 mins

```
[402]: # Summary statistics for numerical columns
print(df_cleaned.describe())
```

	rating
count	1500.000000
mean	4.209067
std	0.477888
min	1.500000
25%	4.000000
50%	4.300000
75%	4.500000
max	5.000000

## 6 Data Preprocessing

### 7 1. Checking for the Missing Values

```
[403]: df_cleaned['rating'].unique()
```

```
[403]: array([4.4, 4.3, 4.1, 4.7, 4.6, 3.9, 4.8, 4.5, 4.2, nan, 3.3, 4. , 3.7,
        3.8, 3.4, 3.5, 5. , 2.9, 4.9, 3.6, 1.9, 2.4, 3. , 2.2, 2.8, 3.1,
        1.8, 3.2, 2.5, 2.7, 1.5, 2.3, 1.6])
```

```
[404]: # Check for missing values
print(df_cleaned.isnull().sum())
```

restaurant_name	0
rating	338
cuisine	0
location	1
delivery_time	0
dtype:	int64

- Since there are missing values present, we *drop the rows* having the missing values.

```
[405]: # Drop rows with missing values
df_cleaned = df_cleaned.dropna()

# Check for missing values after dropping
print(df_cleaned.isnull().sum())
```

```

restaurant_name    0
rating              0
cuisine            0
location           0
delivery_time      0
dtype: int64

```

Now, there are no any missing values present in the dataset.

## 8 2. Transform the ‘delivery\_time’ column into a numeric format for analysis

```

[406]: # Extracting the lower bound of the delivery time range (e.g., "40-45 mins" -> 40)
df_cleaned['delivery_time'] = df_cleaned['delivery_time'].str.extract('(\d+)').
    astype(int)

```

## 9 3. Detect and handle outliers in the ‘rating’ and ‘delivery\_time’ columns

```

[407]: # Define a function to detect outliers using the IQR method
def detect_outliers_iqr(df, column):
    Q1 = df[column].quantile(0.25)
    Q3 = df[column].quantile(0.75)
    IQR = Q3 - Q1
    lower_bound = Q1 - 1.5 * IQR
    upper_bound = Q3 + 1.5 * IQR
    outliers = df[(df[column] < lower_bound) | (df[column] > upper_bound)]
    return outliers

```

```

[408]: # Detecting outliers
rating_outliers = detect_outliers_iqr(df_cleaned, 'rating')
delivery_time_outliers = detect_outliers_iqr(df_cleaned, 'delivery_time')

# Handle outliers by capping them to the upper and lower bounds
rating_lower_bound = df_cleaned['rating'].quantile(0.25) - 1.5 * (
    df_cleaned['rating'].quantile(0.75) - df_cleaned['rating'].quantile(0.25))
rating_upper_bound = df_cleaned['rating'].quantile(0.75) + 1.5 * (
    df_cleaned['rating'].quantile(0.75) - df_cleaned['rating'].quantile(0.25))
df_cleaned['rating'] = df_cleaned['rating'].clip(lower=rating_lower_bound,
    upper=rating_upper_bound)

delivery_time_lower_bound = df_cleaned['delivery_time'].quantile(0.25) - 1.5 * (
    df_cleaned['delivery_time'].quantile(0.75) - df_cleaned['delivery_time'].
    quantile(0.25))

```

```

delivery_time_upper_bound = df_cleaned['delivery_time'].quantile(0.75) + 1.5 *
↳(df_cleaned['delivery_time'].quantile(0.75) - df_cleaned['delivery_time'].
↳quantile(0.25))
df_cleaned['delivery_time'] = df_cleaned['delivery_time'].
↳clip(lower=delivery_time_lower_bound, upper=delivery_time_upper_bound)

```

```
[409]: df_cleaned.info()
```

```

<class 'pandas.core.frame.DataFrame'>
Index: 1500 entries, 0 to 1836
Data columns (total 5 columns):
#   Column          Non-Null Count  Dtype
---  -
0   restaurant_name  1500 non-null   object
1   rating           1500 non-null   float64
2   cuisine          1500 non-null   object
3   location         1500 non-null   object
4   delivery_time    1500 non-null   int64
dtypes: float64(1), int64(1), object(3)
memory usage: 70.3+ KB

```

```
[410]: rating_outliers.shape, delivery_time_outliers.shape
```

```
[410]: ((67, 5), (4, 5))
```

```
[411]: df_cleaned.head()
```

```

[411]:
   restaurant_name  rating  cuisine \
0   Chinese Wok      4.4    Chinese, Asian, Tibetan, Desserts
1  Five Star Chicken  4.4    Burgers
2      Subway      4.3    Salads, Snacks, Desserts, Beverages
3   Pizza Hut      4.1    Pizzas
4  Nandhana Palace  4.4  Biryani, Andhra, South Indian, North Indian

   location  delivery_time
0  Malleshwaram          40
1    Majestic           25
2  Basavanagudi          20
3  Basavanagudi          25
4   Rajajinagar          35

```

```
[412]: df_cleaned.shape
```

```
[412]: (1500, 5)
```

After dropping rows having the missing values, there are **1499 rows** in the dataset. Hence, we will perform analysis on this dataset.

## Observations from Preprocessing:

1. Missing Values: Initially, there were missing values in the 'rating' column. These were handled by dropping the rows with missing values, ensuring data completeness.
2. Delivery Time Transformation: The 'delivery\_time' column was originally in a string format (e.g., "35-40 mins"). It was transformed into a numeric format by extracting the lower bound of the delivery time range, making it suitable for analysis.
3. Outlier Handling: Outliers were detected in both the 'rating' and 'delivery\_time' columns using the IQR method. These outliers were capped to the upper and lower bounds calculated using the IQR, preventing them from unduly influencing the analysis.
4. Data Types: After preprocessing, the 'rating' and 'delivery\_time' columns are in numeric format (float64 and int64, respectively), allowing for quantitative analysis.
5. Data Shape: The initial dataset had 1838 rows. After removing duplicates and handling missing values, the final cleaned dataset used for analysis has fewer rows.

These preprocessing steps ensure that the data is clean, consistent, and suitable for further analysis and modeling.

```
[413]: df_cleaned['rating'].unique()
```

```
[413]: array([4.4 , 4.3 , 4.1 , 4.7 , 4.6 , 3.9 , 4.8 , 4.5 , 4.2 , 3.3 , 4. ,  
        3.7 , 3.8 , 3.4 , 3.5 , 5. , 3.25, 4.9 , 3.6 ])
```

```
[414]: # Distribution of 'Ratings':  
df_valid_Ratings = df_cleaned[df_cleaned['rating'] > 0]  
df_valid_Ratings
```

```
[414]:
```

	restaurant_name	rating	\
0	Chinese Wok	4.40	
1	Five Star Chicken	4.40	
2	Subway	4.30	
3	Pizza Hut	4.10	
4	Nandhana Palace	4.40	
...	...	...	
1830	BHAIRAVESHWARA MILITARY HOTEL	3.25	
1831	The Mandi House	3.40	
1833	Shree Organic World	4.70	
1835	Kingdom Of Shawarma & Grill	5.00	
1836	Fish N Fry	4.50	

	cuisine	location	\
0	Chinese, Asian, Tibetan, Desserts	Malleshwaram	
1	Burgers	Majestic	
2	Salads, Snacks, Desserts, Beverages	Basavanagudi	
3	Pizzas	Basavanagudi	
4	Biryani, Andhra, South Indian, North Indian	Rajajinagar	

	...	...
1830	Biryani, Indian	Malleshwaram
1831	Indian, Chinese, Beverages	Central Bangalore
1833	South Indian, Snacks	Malleshwaram
1835	Arabian, Chinese	Basaveshwaranagar
1836	Snacks, Indian	Basaveshwaranagar

	delivery_time
0	40
1	25
2	20
3	25
4	35
...	...
1830	40
1831	45
1833	40
1835	40
1836	40

[1500 rows x 5 columns]

## 10 Visualizations:

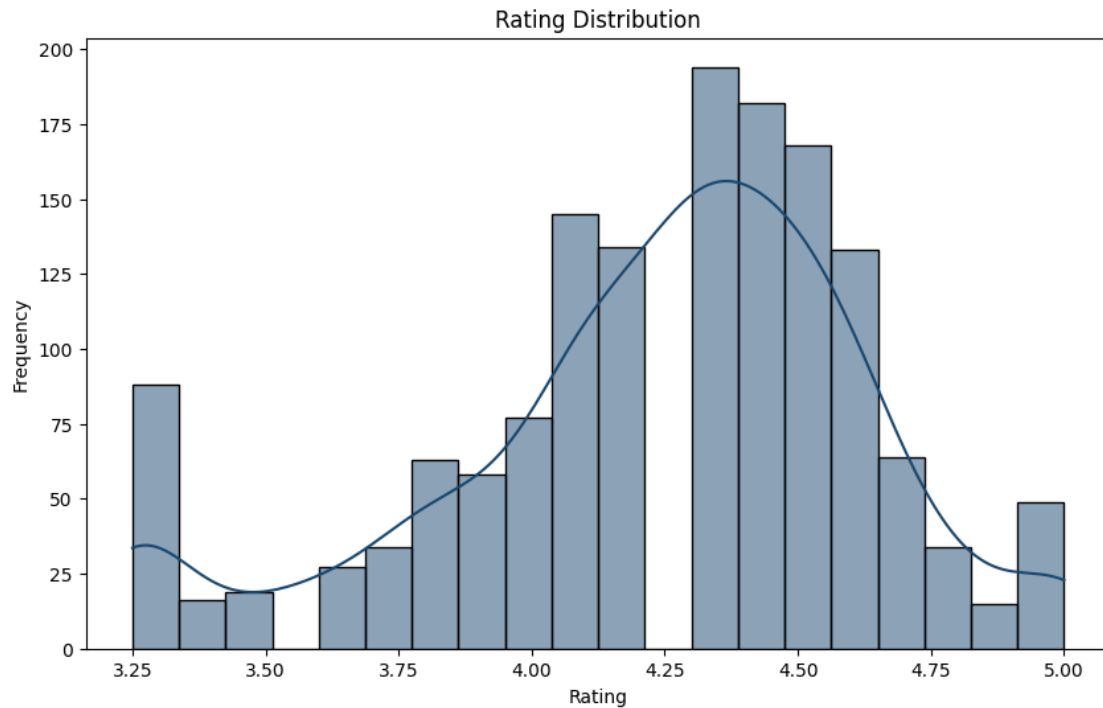
- DISTRIBUTION OF RATINGS:

```
[415]: # Analyze the distribution of ratings
ratings = df_cleaned['rating']

# Calculate the average rating and the range of ratings
average_rating = ratings.mean()
rating_range = ratings.min(), ratings.max()

# Plot the distribution of ratings
plt.figure(figsize=(10, 6))
sns.histplot(ratings, bins=20, kde=True, color='#1A4870')
plt.title('Rating Distribution')
plt.xlabel('Rating')
plt.ylabel('Frequency')
plt.show()
```





```
[416]: # Check for skewness and outliers
skewness = ratings.skew()
outliers = ratings[(ratings < ratings.quantile(0.05)) | (ratings > ratings.
    ↪quantile(0.95))]

print("Average Rating:", average_rating)
print("Rating Range:", rating_range)
print("Skewness:", skewness)
print("Outliers Description:")
print(outliers.describe())
```

Average Rating: 4.231433333333333

Rating Range: (3.25, 5.0)

Skewness: -0.671411271080657

Outliers Description:

count 131.000000

mean 4.093511

std 0.866878

min 3.250000

25% 3.250000

50% 3.250000

75% 5.000000

max 5.000000

Name: rating, dtype: float64

Here are some key observations from the rating distribution analysis:

- **High Average Rating:** The average rating across restaurants is 4.21, indicating generally positive customer experiences.
- **Rating Concentration:** Most ratings are concentrated between 4.0 and 5.0, suggesting that the majority of restaurants are well-rated.
- **Negative Skewness:** The negative skewness (-1.66) shows that the distribution of ratings is biased towards higher values, with fewer restaurants receiving lower ratings.
- **Outliers:** There are a few outliers on the lower end, with ratings below 3.84. These may represent restaurants with consistently poorer reviews.

Overall, the data suggests a strong tendency towards positive ratings among the restaurants analyzed.

#Grouping the Restaurants based on the Location:

```
[417]: df_cleaned['location'].unique()
```

```
[417]: array(['Malleshwaram', 'Majestic', 'Basavanagudi', 'Rajajinagar',  
'Vasanth Nagar', 'RAJAJI NAGAR', 'Shantinagar', 'VV Puram',  
'Central Bangalore', 'St. Marks Road', 'Ashok Nagar',  
'Koramangala', 'Banashankari', 'Vijay Nagar',  
'Srinivasa Brahmins Bakery', 'Jayanagar',  
'PES college Hanumanth nagar', 'Azad Nagar', 'Mysore Road',  
'Shanthinagar', 'Cunningham Road', 'Magadi Road', 'Residency Road',  
'Church Street', 'Basavangudi', 'Hanumanthanagar', 'Chamarajpet',  
'Shanti Nagar', 'Wilson Garden', 'Vijayanagar', 'AUSTIN TOWN',  
'Chamarajapete', 'VIJAYNAGAR', 'Gandhi Nagar',  
'K G CIRCLE, MAJESTIC', 'Gandhi Bazaar', 'Malleswaram',  
'Seshadripuram', 'Adugodi', 'BTM Layout', 'Gopalapura',  
'Basaveshwara Nagar', 'Shanthi Nagar', 'Rashtriya Vidyalaya Rd',  
'Binnipete', 'Gandhi Bazar', 'Brigade Road', 'Vittal Mallaya',  
'Diagonal Road, 3Rd Block', 'Shivajinagar', 'City Market',  
'Sampangi Rama Nagar', 'V V Puram', 'Sadashiv Nagar',  
'Race Course Road', 'Sadashiva Nagar', 'MALLESHWARAM',  
'Vishweshwarapura', 'Aishwarya Sampura', 'Vasanthanagar',  
'Gopalpura', 'Richmond Town', 'Banashankari-Girinagar',  
'RAJAJINAGAR', 'ADUGODI', 'Richmond Road', 'Jaya Nagar',  
'Vijyanagar', 'Lavelle Road', 'Swaroop Nagar', 'Commercial Street',  
'High Grounds', 'Cholourpalya', 'Chandra Layout',  
'Basaveshwaranagar', 'Sobha Mall, St. Marks Road', 'UB City',  
'MG Road', 'Magrath Road', 'BANASHANKARI 3RD STAGE',  
'Vittal Malliya Road', 'St. Marks road', 'Shivaji Nagar',  
'LULU MALL', 'Battarahalli', 'S.G Paliya', 'Bhawani nagar',  
'Balepet', 'MAJESTIC', 'Austin Town',  
'Kesar Rajasthani Parotha Point', 'BASAVANGUDI', 'Nagarbhavi',  
'Tavarekere', 'JP Nagar', 'Hanumant Nagar Basavangudi', 'Chickpet',
```

```
'Katrigeppu', 'central bangalore', 'BTM', 'Infantry Road',
'Shanthinagara', 'NEAR CITY RAILWAY STATION', 'Brigade road',
'LAKKASANDRA', 'Audgodi', 'Vasanthnagar', 'Bharati nagar',
'Sheshadripuram', 'Sobha Mall, St.Marks Road',
'Confido Multi specialty Hospital', 'Dwarakanagar', '6TH BLOCK',
'KHB Colony', 'Rajajinagara', 'Sudham Nagar', 'Vijaynagar',
'J C Road', 'S G palya', 'wilsion garden', 'Mount Joy Rd',
'BASAVESHWARA NAGAR', 'Rajarajeshwari Nagar', 'Girinagar I Phase',
'Basaveshwar Nagar', 'GOVINDARAJANAGAR', 'M.c.layout',
'CentralBangalore', 'Mysore road', '2ND BLOCK RAJAJINAGAR',
'Yelahanka', 'chick bazaar road,old cemetery road ,opp to Elaf w',
'SOBHA MALL', 'S G Palya', 'St Marks Road', 'Reliance Fresh',
'S.G. Palya', 'Kammanahalli/Kalyan Nagar', 'Outer Ring Road',
'Gandhinagar', 'Guddadahalli', 'hanumanthnagar',
'Lal Bagh Road, Shanti Nagar', 'korangalore adugodi', 'Nagawara',
'Girinagar 1st phase', 'Jalahalli-Peenya'], dtype=object)
```

## 11 Group all the restaurants based on the locations and storing it in different variables

```
[418]: # Group restaurants by location
restaurants_by_location = df_cleaned.groupby('location')['restaurant_name'].
    .apply(list)

# Store groups in different variables (example)
koramangala_restaurants = restaurants_by_location.get('Koramangala 1st Block,
    Koramangala')
malleshwaram_restaurants = restaurants_by_location.get('Malleshwaram')
indiranagar_restaurants = restaurants_by_location.get('Indiranagar')
rajajinagar_restaurants = restaurants_by_location.get('Rajajinagar')
sgpalya_restaurants = restaurants_by_location.get('SG Palya')

# Print the grouped restaurants for each location
for location, restaurants in restaurants_by_location.items():
    print(f"Restaurants in {location}: {restaurants}")
```

```
Restaurants in 2ND BLOCK RAJAJINAGAR: ['Last Stop Resto Cafe']
Restaurants in 6TH BLOCK: ['Lubov Patisserie']
Restaurants in ADUGODI: ['Cheesecakes By CakeZone', 'CakeZone Patisserie', 'The
Dessert Heaven - Pastry, Brownie and Cakes', 'Crunchhh - Burgers By Nomad',
'Ovenfresh - Baking Cakes Since 2009']
Restaurants in AUSTIN TOWN: ['Protein Chef', 'DiabeSmart - Sugarfree Foods',
'Naadbramha Idli', 'Lo! - Low Carb and Keto Foods', 'ATH - All Things Healthy!',
'SPICE N NICE', 'SMOKY DOCKY', 'Biryani.com', 'New Ambur Biryani', 'Krishnam
Veg', 'Khana Makhan', 'little chef since1997', 'New Cafe Khaadya', 'Arco Family
```

Restaurant', 'Rolls Adda', 'Food Hub']  
 Restaurants in Adugodi: ['Polamma's Mess', 'New Udupi Grand', 'New Ambur Biryani Point', 'Roti Curry & Co', 'The Daily Bowl', 'Mahi Bakehouse', 'Thali 99', 'Puliyogare Palace', 'Bowl 99', 'Chiru's Biryani']  
 Restaurants in Aishwarya Sampura: ['Costa Coffee']  
 Restaurants in Ashok Nagar: ['Theobroma', 'Lucknow Street', 'Third Wave Coffee', 'Easybites By Empire', 'Yak Kitchen', 'Glen's Bakehouse', 'Chung Wah Express', 'The Living Room', 'Bucket Biryani', 'ITC Gardenia - Biryani And Pulao Collection', 'Daily Sushi', 'Frosty Crumble by Art Of Delight', 'The Dragon House', 'Virinchi Cafe', 'Kaippunnam Restaurant', 'Navya Samrat', 'Toast & Tonic', 'Palmgrove Ballal Residency', 'Sweet Chariot Cafe', 'Bella Donna', 'Tottos pizza', 'RR Biryani', 'Mandarin Box', 'Tea Lounge Cafe', 'Namma Adda', 'Little White Kitchen', 'Sattuani', 'Gelato Italiano', 'Idli Macha', 'China Flame', 'Zest', 'Paddy Platter: Rice and Shine', 'Neeth Medappa Patisserie', 'Madam Hakka', 'Kenzai-Asian Kitchen & Lounge', 'Vaniyambadi Biryani', 'Record Room', 'Da-Fu', 'Cluk Cluk', 'Burrp Pizza', 'Shahi Biryani', 'Bombay Borough', 'Hayaan'S & Cafe and Bakery']  
 Restaurants in Audgodi: ['J.M.V Condiments']  
 Restaurants in Austin Town: ['The Pastry House', 'Allana Kabab', 'Tandoori Wok']  
 Restaurants in Azad Nagar: ['WeFit - Protein Bowls, Salads & Sandwiches']  
 Restaurants in BANASHANKARI 3RD STAGE: ['Ovenfresh Cakes and Desserts']  
 Restaurants in BASAVANGUDI: ['Pipabu']  
 Restaurants in BASAVESHWARA NAGAR: ['HOTEL KARNATAKA PARADISE']  
 Restaurants in BTM: ['Adam's Kitchen & Eatery', 'Tositos', 'Wok n Spoon', 'Adc-A Dough Cookie', 'Oriental Food', 'Kushi Restaurant', 'Coastal Waves', 'Chef Inbox', 'Waffle And Shakes', 'Cane Ras And More', 'Cane Brosia', 'Naati Tiffin Room', 'Om Sri Biryani Point', 'Crunchy Treat']  
 Restaurants in BTM Layout: ['Savoury Seashell Restaurant', 'Freskues', 'Karavali Fine Dine', 'The Curry House', 'Eat n Drink', 'Food Junction', 'Toasted Delight', 'Tussco', 'Sassy Grub Box', 'Al SWAD HOTEL']  
 Restaurants in Balepet: ['SGS Nonveg Gundu Palav (Balepet)']  
 Restaurants in Banashankari: ['Ayodhya Upachar', 'Cheesecake & Co.', 'Chikpet Donne Biryani House - Srinagar', 'NIC Ice Creams', 'Beijing Bites', 'Anna Kuteera', 'Uttara Karnataka Jolada Rotti & Chapati Angadi', 'Vinny's', 'Bombay Ice Cream Co', 'Purani Dilli By Anand Sweets', 'XO Belgian Waffle', 'Shawarma on Wheels', 'Aramane Donne Biryani', 'ITC Fabelle Chocolates', 'Leon's - Burgers & Wings (Leon Grill)', 'Rolls & Wraps by HRX', 'Big Bowl', 'Rolls On Wheels - Shawarma & Wraps', 'Chai Point', 'Meat and Eat', 'Uttara Karnataka Jolada Rotti Angadi', 'Udupi Ruchi Grand', 'Dal Tadkaa', 'Tandoori Knight', 'Sindhoora Gardenia', 'Kabab King', 'Food Stories', 'Kake Di Hatti', 'Rasoi', 'Donne Biryani Mane', 'The Momo Co.', 'Hotel New Karavali', 'Yediyur Ramanna Military Hotel', 'Pannagas Bangarpet Chats', 'Kholi Mane', 'Shivas Chats', 'Banashankari Donne Biryani', 'Shree Vasavi Chats and Bangarpet Pani Puri', 'Trilok Restaurant', 'Spicy Andhra Ruchulu', 'Davanagere Benne Dose Hut', 'Royal Donne Biryani', 'Mysore Mutton Palav', 'Namo Andhra - Pure Veg', 'SLV Swadishta (South Indian)', 'Panchami Veg', 'Local Panda', 'U. K. Foods', 'Kabab King Restaurant', 'The Red Lantern', 'Madhan Fish Tawa Fry', 'Koku Kitchen', 'EatEroo South China', 'Tiny Bites', 'Maruthi Davanagere Benne Dose', 'Shettys Red',

'Midnight Cafeteria', 'RIS', 'Gnanesh Fruit Juice Center', 'Ashok sweets', 'Samipa Iyengar Bakery', 'Snack Factory', 'New Aaradhya Food Line', 'House of Vadapav', 'Fry Lab', 'Om Sri Vinayaka Chats', 'Old Bangalore', 'P B VARIER (BAKE HOUSE)', 'Biriyani 365', 'Crave Cream', 'Hotel Naveena Mane Beegara Oota', 'Just Bake - Bakery, Desserts, Cakes & Confectioners', 'New Donne Biriyani Mane', 'VadaWala', 'Fries Box', 'Kebab Xpress', 'Cake Of The Day', 'Ambur Hot Dum Biryani', 'Iyengar's Cake World & Sweets', 'New Gowdru Mane Badoota', 'MomoNest', 'Gopi Ice Cream', 'Round The Clock', 'HOTEL UTSAV North Indian Food Joint', 'Scuzo Ice O Magic', 'Namma Biriyani', 'Lakshmi Sweets & Chats', 'Stoned Monkey', 'Chinese Nest', 'Devanna Dum Biryani Corner', 'Madappa Hindu Miltry Hotel', 'Kaapi thindi', 'Fries Factory Banashankari', 'Antra Veg', 'Chandni Chowk', 'Enchante By Chai Point', 'Appu Anabe Adda', 'Cocoa Bakes', 'Sri Krishna bhavana', 'Krunchy Bites', 'Sri Sai chinese center', 'SLV Refereshments', 'Donne Biriyani Kendra', 'Kavali Hotel', 'Abhinandan Enterprise (Abhinandan Juice)', 'Rolls Affair', 'Bengaluru Aramane Donne Biriyani', 'The Chaats Factory', 'Shawarama Cravings', 'Crispy Rolls And Burgers', 'Hotel Devaregathi', 'Mandya Gowdru Mane', 'DILUTE Barmen Kitchen', 'M M BAR AND RESTAURANT', 'Fudgetastic', 'Dessert Rose', 'Akram Hotel', 'The Magnus Cafe', 'Anand Biryani House - Naati Style', 'ROLL MAGIC FAST FOOD', 'Bonkers Over Biriyani', 'My Tea House', 'Juicy n Crunchy', 'Bangalore Sandwich', 'Galli Kitchen', 'Big Mishra Pedha', 'Sardarji Londonwaley', 'Punjabi Highway', 'Jalandhar Junction', 'Karan Chache da Dhaba', 'Teago cafe', 'Karavali Fish Kabab Point', 'Haveli Punjab Di', 'Gobi Aunty Food Court', 'New Sree Banashankari Donne Biryani Corner', 'Shakespert', 'Dream Gowdas', 'Kidambi's Kitchen', 'Remaz Cafe']

Restaurants in Banashankari-Girinagar: ['Yum Me Too']

Restaurants in Basavanagudi: ['Subway', 'Pizza Hut', 'Corner House Ice Cream', 'MOJO Pizza - 2X Toppings', 'Shiv Sagar Signature', 'KFC', 'McDonald's', 'La Pino'z Pizza', 'Burger King', 'Domino's Pizza', 'Haldirams Restaurant & Sweets', 'Dwarkamai Pure Veg Restaurant', 'SLV Corner Restaurant', 'Sharma's Kulche', 'Karnataka Bhel House', 'A2B - Adyar Ananda Bhavan', 'Kulfi Shulfi - Kulfis & Icecreams', 'Puliyogare Point', 'Paakashala', 'Nandhini Deluxe', 'Tiwari's Ghee Paratha & Chaat', 'Murugan Cafe', 'Roti Ghar', 'Pastas By Pizza Hut', 'Andhra Ruchulu', 'Sri Venkateshwara Sweet Meat Stall', 'South Kitchen', 'SRI VISHNU PARK', 'Asha Sweet Center - Since 1951', 'Hari Super Sandwich', 'Curry Leaves', 'Utsav Restaurant', 'Udupi Grand', 'Vijayalakshmi', 'Gokul Veg', 'New Prashanth Hotel', 'Udupi Aatithya', 'Shanthi Sagar', 'Hotel Dwarka', 'Chinese Square', 'Pizza Galleria', 'Dairy Day Ice Creams & Frozen Desserts', 'Kulfi Shulfi (Bombay Kulfis)', 'Shree Mahalakshmi Sweets', 'Paratha Wala', 'Sri Sai 99 Variety Dosa', 'McDonald's Gourmet Burger Collection', 'Havmor Havfunn Ice Cream', 'Apna dhaba', 'Chaat Ka Chaska', 'Singh Da Punjabi Dhaba', 'Food Adda', 'Bhatti Chicken - Grilled, NOT Fried!', 'Sri Krishna Sweets', 'Just Bake', 'Haldiram's Sweets and Namkeen', 'The Belgian Waffle Co.', 'Punjabi Unplugged', 'Mad Over Donuts', 'Kabab Magic', 'Ibaco', 'The cake deluxe', 'Deccan Biryani', 'Shivanna Gulkan Store', 'InChi', 'Vidyarthi Bhavan', 'Twiststick House', 'Jain and Veg Cuisines', 'Baisakhi', 'Kollapuri's Non-veg', 'Shyam Mishra Juice Centre Llp', 'Melting Cheese', 'Bhattara Bhojana', 'Chikkanna Tiffin Room', 'Jolada rotti angadi', 'Crown Land', 'Chotu motu Vadapav wala', 'Uttara karnatakadha Jolada rotti Mattu Chapati Angadi', 'The Chatpata Affair', 'K C Das', 'Hotel

Karavali', 'Udupi Sri Krishna Bhavan', 'Pizza-Man', 'Antarastriya', 'Kollapuri's Cloud Kitchen', 'Protein Station', 'Shrinidhi Military Hotel', 'Nisarga Garden', 'Kamat Bugle Rock', 'Savis Butter Sponge', 'Cafe Mondo', 'Gama Gama Hotel', 'Hello! Dose Master', 'J K MERIDIAN - JK COASTAL CURRY', 'The cake fancy', 'Manchurian Corner', 'Sakkath Dosa', 'Old Bangalore Cafe', 'SMV Snacks corner', 'Sandwichwalla', 'Momo Wala', 'Patiala Lassi', 'The Pizzeria', 'Mayura Cafe', 'Ice Thunder - Balaji's Veg', 'South Thindis', 'Om Shiva Shakthi chats center', 'Sardarji Londonwaley Pure Veg', 'Punjabi Nawabi Pure Veg', 'Navi Food Point', 'Mumbai Masala', 'Little Cafe', 'By 2 Coffee Stores', 'Patiala NH 44', 'Sri Ganesh Sweets', 'Sakath Momos', 'Butter Batter', 'Bunt's Biryani Palace', 'Sri Sai Cafe', 'Sri Sai Chats, Bangarpet Chats', 'Shere Punjab Veg Dhaba', 'Punjabi pure veg Restaurant since 1994', 'Basavanagudi Donne Biryani', 'Sri Ranganatha Military Hotel', 'The Twenty Handmade Chocolates', 'Hotel Bilal Biryani Centre', 'The sip shop', 'Megna's Gourmet', 'Insane Resto Cafe', 'Cafe San Churro', 'Lohiya's Kitchen', 'Salz Burg', 'Savji's', 'Tikka Nights', 'Nandi Chats', 'Hotel select', 'Sri Kottureshwara Davangere Benne Dose Hotel', 'MK Dosa Point', 'Board 4 Bored', 'B&B The Pub', 'Aaha Andhra', 'SLN Tasty Corner', 'LGC foods', 'Raasa', 'Bowled over by Board 4 Bored', 'Dezire SugarFree Sweets & Bakes', 'The Soup Project', 'J B Bakery', 'The Studio Cafe', 'Bangarapet bhel house', 'Davanagere Benne Dosa Manne', 'Rathan Juice Center', 'Uttara Karnataka Prasiddha Jolada Rotti And Chapati', 'kolkata King', 'Pizzato', 'Coffee time', 'Dream bites', 'Namma Bengaluru cafe', 'The Dawat Co.', 'Mr. Panipuri', 'Radha Krishna Food Corner', 'Bombay snacks centre', 'Meal4U', 'Harshi Super Sandwich', 'Sri Mahadsehwara Mushroom Dum Biryani', 'The Curry Chawal Company', 'N.V. Naidu Hotel', 'South Tadka', 'Hotel Prashanth', 'Madurai Famous Jigarthanda', 'Cane Hut', 'Gainzz', 'Cake Yard', 'By 2 Coffee Tazza Holige', 'Prashanth Naati And Spicy', 'Skoosh Bubble Tea - No Tapioca', 'Pista House Haleem', 'J K Fish Land', 'Mdr Biryani House', 'Wonder Box', 'Hamd Kitchen', 'Bekwizz', 'Northie-Southie', 'Adbhutha', 'Mamatha's kitchen', 'Uttara Karnataka Jolad Rotti & Chapathi Store', 'Gobi Magic']

Restaurants in Basavangudi: ['The Good Bowl', 'Kolkata Famous Kati Roll', 'McCafe by McDonald's', 'Creams & Bites', 'Uttara Karnataka Jolada Roti']

Restaurants in Basaveshwar Nagar: ['Sri Maruthi Biryani Corner', 'Udupi Upachara']

Restaurants in Basaveshwara Nagar: ['Shivanna Military Hotel', 'Cookie Man', 'Om Agarwal Bhavan', 'Kabab Palace', 'Mayura 1989', 'Shree Veerabhadreshwara Rotti Holige Mane', 'South Spicy Bites Xpress', 'Chandu's Hotel', 'Chopstick World', 'Saffron By Sanmanaa', 'YumJar', 'Krazy Adda', 'Cave N Dine', 'Manavarike Restaurant']

Restaurants in Basaveshwaranagar: ['Rasotsav', 'Amritsari Express', 'Brahmin's Rotti Ruchi', 'Namma Filter Coffee', 'Kadegowda Military Hotel', 'Sri Shivanandi Mushroom Donne Biryani House', 'Hotel Malabar Kitchen', 'A N Foods', 'Rajajinagar Biryani Hub', 'Thancos natural ice cream', 'Radhakrishna Cafe', 'The Kota Taste', 'Maggie World', 'Satya's Kitchen', 'Teaday', 'Sea Spice Sea Food Restaurant', 'Vysam', 'AUTHENTIC BIRIYANI CORNER', 'Sri Raghavendra Hotel And Dosa Corner', 'M R HOTEL', 'Ambika Grand', 'Wall Town', 'Kavitha Bakery', 'Kolhapuri Biryani House', 'Khushi's Kitchen', 'Tea Time Cafe', 'Bliss Burgers', 'New Aatithya Restaurant', 'Kingdom Of Shawarma & Grill', 'Fish N Fry']

Restaurants in Battarahalli: ['Plan B']

Restaurants in Bharati nagar: ['Excelsior bakery']

Restaurants in Bhawani nagar: ['Cake']

Restaurants in Binnipete: ['Starbucks Coffee', 'Frozen Bottle - Milkshakes, Desserts And Ice Cream', 'Flying Kombucha', 'Cold Stone Creamery']

Restaurants in Brigade Road: ['Kanti Bakes And Flakes', 'Klava- Turkish Patisserie', 'Samosa Party', 'Restaurant Chef Pillai', 'Foo', 'Burma Burma', 'Nando's', 'Karavali Family Restaurant', 'Hotel Ocea', 'Anjappar', 'Arbor Brewing Company', 'The Chariot Veg Restaurant', 'Kuuraku', 'Aaliyar Ambur Dum Biryani', 'ShakesBierre', 'Cafe Rustico', 'Taste Of Tibet']

Restaurants in Brigade road: ['Boba Tea A Taiwanese Bubble Drink']

Restaurants in Central Bangalore: ['The Pizza Bakery - Wood Fired Sourdough', 'New Udupi Upahar', 'Paris Panini - Gourmet Sandwiches & Wraps', 'Bheema's', 'Beyondburg Inc', 'Rolls Mania - Rolls, Wraps & More', 'Hotel Annapoorna', 'Kabab Korner', 'Namo Andhra', 'HRX Beverages - Juices, Coffee & Kombucha', 'Thenga Manga by Chef Pillai', 'Paragon Restaurant Since 1939', 'Hamza hotel', 'NCHEF RESTAURANT', 'Chalukya Samrat Cafe Since 1977', 'Sikandar Rolls', 'Green Onion Chinese-Residency Road', 'Fresh Pressery Cafe', 'The Doner Company - Shawarmas & More', 'Foodcosta', 'Sri Udupi Park', 'Suryawanshi', 'KARIM'S- Original from Jama Masjid Delhi- 6", 'Khan Saheb Grills and Rolls', 'Ciro's Pizzeria', 'GOCHICK', 'Queen's Restaurant', 'Smoke House Deli', 'Drunken Monkey', 'Seoul Fried Chicken', 'Royal Restaurant', 'Churmur Chaat Co', 'Chaileela', 'Kamats Palate Korner', 'Hotel Tom's Restaurant', 'In Wok', 'FoodX Restaurant', 'Main Lassi Shop', 'Cafe Mor'ish', 'Green Theory', 'Azukii Bistro', '13th Floor', 'Asean - On The Edge', 'Bareerah Multicuisine Restaurant', 'Infinitea', 'Iyengar'S Delicacies', 'Hotel Green Tara', 'Ujwal Family bar and restaurant', 'Shangrila Restaurant', 'Maayaa', 'Ramji Chaiwale', 'Ebony', 'The Caffeine Baar', 'India Chai Lounge', 'Teju Fryd', 'Thai Hub', 'Tart Cafe', 'The Konkani - Seafood Restaurant', 'Spiceklub Restaurant', 'Lickies Gelato - Ice Cream & Bubble Tea', 'ITC Gardenia -Gourmet Couch', 'Cafe Azzure', 'Woahffles', 'Itc Gardenia - Nutmeg The Gourmet Shop', 'Papparoti', 'The London Curry House', 'F For Fries', 'Sheeshkebab Xpress', 'Airlines Hotel', 'Tewari Bros Mithai Shop', 'Ramary Crumb', 'Delhi Sweets', 'Bubble Tea Cafe A Taiwanese Boba Drink', 'Step Right Up', 'Lifetree', 'Deccan Spices', 'Begum Victoria', 'Avnathi,Aromas Of Andhra', 'Fia s Lounge', 'Beijing Corner', 'Aaha Thindi', 'The Boba King', 'The French Conway Gelato', 'Edo - Japanese Restaurant and Bar, ITC Gardenia', 'ABC Kolkata kitchen', 'Happy Buddha', 'Metropole Restaurant', 'Aaradhya Donne Biryani House', 'La Bonita', 'Kallu'S Restaurant', 'Ayda Persian Kitchen', 'PITSTOP JUICE CENTRE', 'Amyra Farms Cafe', 'Ice And Rolls', 'Mannheim Craft Brewery', 'Madeena Biryani Point', 'Khalifa Restaurant', 'Blini Bistro', 'Happy Milkshakes', 'Apna Lassi', 'BRIGADE TAJ RESTAURANT', 'M.S Lassi & Shakes', 'Sapphire By Unicorn', 'Tiger Trail - Regenta Place', 'Tandoori Taal', 'Go Native', 'Nerlu Cafe', 'Street Eats', 'Hive Honey Cake', 'Hotel Egg and Chicken', 'Cane and Cream', 'Indian spice foods', 'Konark Veg Resturant', 'The Mandi House']

Restaurants in CentralBangalore: ['KFDC Mathsya Darshini']

Restaurants in Chamarajapete: ['India Sweet House']

Restaurants in Chamarajpet: ['By 2 Coffee']

Restaurants in Chandra Layout: ['Le Arabia Restaurant']

Restaurants in Chickpet: ['Punjab Rajasthan Express Restaurant']

Restaurants in Cholourpalya: ['V Cafe - Meals By PVR']

Restaurants in Church Street: ['Biryani Blues', 'Dumont Creamery', 'Social', 'Anupams Coast II Coast', 'The Only Place', 'Roomali', 'Zoroy Luxury Chocolates', 'Karnatic', 'Hoppipola', 'RCB Cafe', 'RCB Bar & Cafe', 'Rasta', 'Benne Donne Biryani Mane', 'FishDish']

Restaurants in City Market: ['Mealful Rolls - India's Biggest Rolls', 'Udupi Sagar', 'Kamat Restaurant', 'Harilal Paan', 'Pai Vihar Grand', 'Hotel Raghavendra Prasanna']

Restaurants in Commercial Street: ['Santhanam Sweets', 'Kailash Parbat', 'Bhagatram Sweets']

Restaurants in Confido Multi specialty Hospital: ['Golivadapav No 1']

Restaurants in Cunningham Road: ['EatFit', 'Suzy Q', 'HRX by EatFit', 'Pasta Street', 'Home Plate by EatFit', 'Olio - The Wood Fired Pizzeria', 'Dunkin' - Donuts & Coffee', 'Crusto's - Gourmet Cheese Burst Pizza', 'Dolci Desserts', 'Tippy Goat Cafe', 'Eden Park', 'Jalebbi Kitchen']

Restaurants in Diagonal Road, 3Rd Block: ['ITC Sunfeast Baked Creations', 'ITC Aashirvaad Soul Creations', 'ITC Master Chef Creations']

Restaurants in Dwarakanagar: ['Ambi Naati Style']

Restaurants in GOVINDARAJANAGAR: ['Pizza Bake House']

Restaurants in Gandhi Bazaar: ['California Burrito']

Restaurants in Gandhi Bazar: ['Kanti Sweets']

Restaurants in Gandhi Nagar: ['Sri Udupi Food Hub', 'Dil Punjabi', 'Bihari Bowl', 'Bowled Over', 'The Burrow', 'Gandhinagar Donne Biryani']

Restaurants in Gandhinagar: ['Boat House Seafood Kitchen']

Restaurants in Girinagar 1st phase: ['Sugar Petals']

Restaurants in Girinagar I Phase: ['Simple Thindies']

Restaurants in Gopalapura: ['Deccan Paradise', 'Keventers Ice Cream', 'Keventers - Milkshakes & Desserts']

Restaurants in Gopalpura: ['Haagen Dazs']

Restaurants in Guddadahalli: ['Udupi Nandus Kitchen']

Restaurants in Hanumant Nagar Basavangudi: ['Hotel Mangala']

Restaurants in Hanumanthanagar: ['Szechuan Dragon']

Restaurants in High Grounds: ['Brik Oven - Original Sourdough Pizzas', 'Zed The Baker', 'See Rock', 'The Baklava Company']

Restaurants in Infantry Road: ['Burnout Cafe']

Restaurants in J C Road: ['New metro hotel']

Restaurants in JP Nagar: ['Food Springs', 'Shakes Theory', 'Baba Punjabi Express', 'Chaiffie Cafe']

Restaurants in Jalahalli-Peenya: ['Sri Guru Raghavendra Uttara Karnataka Hotel']

Restaurants in Jaya Nagar: ['Simpli Namdhari's', 'FNP- Ferns N Petals']

Restaurants in Jayanagar: ['Hari Super Sandwich (3rd Block)', 'Marwadi chaat & Tiffin services shantinagar (Jodhpur wala)', 'Natural Ice Cream', 'LunchBox Meals and Thalies', 'Polar Bear', 'Sweet Truth Cake and Desserts', 'Upahara Darshini', 'Shravan Specials by Lunchbox', 'NOTO - Ice Creams & Desserts', 'The Krishna Grand', 'Rajathadri Food Fort', 'Faasos Signature Wraps & Rolls', 'Sri Nayvedya Veg', 'Mithaicana', 'Sri Udupi Vaibhava', 'RNR Biryani - Taste of



1953', 'Kulfilicious', 'Vital Bowls - Salads & more', 'Anand Sweets & Savouries', 'The Biryani Life', 'Biriyaani Mane', 'Chickpet Donne Biryani House', 'Art Of Delight - Ice Creams, Sundaes And Desserts', 'Trattoria by Toscano', 'Veg Daawat by Behrouz', 'Go Zero Ice Creams & Desserts', 'The Pizza Project by Oven Story', 'Senoritas Mexican kitchen by Little Italy', 'A1 Chips', 'Amma's Pastries', 'Bombay Kulfi', 'Nothing Before Coffee', 'Sorbetto - Ice Creams', 'Aromas of Biryani', 'Milano Ice Cream', 'Chung's Chinese Corner', 'Basaveshwar Khanavali', 'Blue Tokai Coffee Roasters', 'Toscano's Crafted Cakes and Desserts', 'Little Italy', 'Oven Story Pizza Standout Toppings', 'Faasos - Wraps, Rolls & Shawarma', 'Donne Biryani Palace', 'New Shanthi Sagar', 'Jodhpur Sweets', 'Piazza Pizza By Little Italy', 'Meghana Foods', 'Bikaner Sweets', 'Amore Gelato - Italian Ice Cream', 'Amul Ice Cream Parlour', 'Behrouz Biryani', 'SGS Non Veg Gundu Palav', 'Firangi Bake', 'Goli Vada Pav No.1', 'Cafe Coffee Day', 'Kapoor's Cafe', 'Halli Jonne Biriyaani', 'Dose Of Davangere', 'New Shanti Upahar', 'Nagarjuna Chimney', 'Toscano', 'SMOOR', 'Taiki', 'Kunafa Bytes', 'SMOOR Gourmet Eats', '1947 Restaurant', 'The Ganache Factory - Cakes & Desserts', 'Masaledaar Desi Rasoi', 'Shetty Lunch Home', 'Mainland China', 'Haka', 'Suchali's Artisan Bakehouse', 'Jalpaan', 'Uncle Peter's Pancakes', 'Arun Ice Creams', 'London Dairy', 'Xero Degrees', 'Asia Kitchen by Mainland China', 'Apna Ghar', 'Guntur Spice', 'Namma Naivedhyam Cafe', 'Pailwan Pulao', 'Via Milano', 'Gufha', 'Bhojnyala', 'N R Donne Biriyaani', 'Rr Fish Land', 'Mangalore Sea Palate', 'Chung Wah Opus', 'Marathi Kitchen', 'Bidadi Thatte idly', 'Venezia', 'Juice Junction & Snacks', 'Kedia's Funfood', 'PANKAJ DELICACIES', 'Chefmaster', 'Ayoham', 'Coal Flame Biriyaani', 'Al Fillfilah Mandi Majlis', 'Anantha', 'Aamchi Dilli', 'Subz', 'Varanasi Cafe (Lassi Ghat)', 'Kanara Scoops', 'Saarangi Fine Dining', 'Kalpavriksha Grand', 'Shokudo Restaurant', 'Eshanya The Restaurant', 'City durbar', 'Mimi Chinese Takeout', 'L&K's Milkshakes', 'LJ Iyengar Bakery And Sweets', 'Chat bandi', 'Maya Bangalore', 'L&K's Pizza', 'Sri Krishna Sweets', 'Japanese Journey', 'Coffee Chemistry', 'Super Smoothies', 'Satvik Kitchen', 'Kongsi Tea Bar', 'Kubo', 'Sri Vasavi Chats', 'Mystique Palate', 'Havenuts Cafe', 'Shyam Mishra Juice Center', 'Ragoo's', 'Pure & Natural', 'Eating Love', 'Agarwal Foods', 'Gustoes Beer and Bouffage', 'Anvitha Holige Mane', 'Masala Love & Co', 'Echakh Danah', 'Chutney Chang', 'Qube Cafe', 'Cloud Kitchen Express', 'Gabagab Ice Creams', 'K Town Korean Kitchen', 'Davanagere Benne Dose', 'Hatti Kaapi - Coffee and more', 'Thyme & Whisk', 'Maiyas Restaurants', 'Clove', 'Bombay Chowpatty', 'Mulbagal Dosa Corner', 'Shake It Off', 'Pure & Sure Organic Cafe', 'Tiger Thai', 'DYCE', 'Bowring Kulfi & Ice Cream', 'Brew Meister', 'Coffee And Crypto', 'Dakshin Thindi', 'Chai Kraft', 'Isobel caffeine bar', 'Caramelts And Charcoal', 'SL Vadapav', 'BOB's Kitchen', 'Mangaluru Seafood', 'Doosri Biwi', 'ALL ABOUT HEALTHY', 'SANMAN - Fine Dining Restaurant', 'Tea Villa Cafe', 'Peppy Parathas & Rolls By Chai Point', 'Khichdi Kahani', 'Dadi Di Rasoi', 'Breakfast Junction', 'Litti Dhuska Wale', 'Baky Bakery And Cakes', 'Dhanyam Cafe', 'Benki Coffee', 'Chicken Magic', 'RJ 19 Cafe', 'Canton', 'Grazers Resto-Bar', 'Shree Vasavi Chats', 'Amma's Biryani Corner', 'Hamdeez Cafe', 'Indian home food (IHF)', 'UFF Urban Food Factory', '4th Tea Block', 'Shankar Guru Bangarpet Chats', 'Anand Donne Biriyaani', 'Yumm Bites', 'Best Vada Pav', 'Kesar by Lilac', 'My Favorite Biryani', 'Crispy Bites Cafe', 'Hridayum Happy Cafe', 'The Chinese Square',

'Italian Bakehouse', 'De Famous Cafe', 'Cafe Arena', 'Dum Pukht Biryani By Aromas', 'Pastries Cake', 'Namma S.L.N', 'MEGHDUTH BIRYANIS', 'Siachi', 'Vg Egg Rice Centre', 'Mush Cafe - Snack N Sip', 'Kaapi 41', 'Aatithya Grand', 'Juice And Sandwiches Hub', 'JKV Military Hotel', 'Shaan E Biryani By Khans', 'Vividh swad', 'Nuts Hut', 'Sri Manjunatha fast food', 'Thai Temptations', 'Brews N Bites', 'Cakewala', 'Havmor Ice Cream', 'Chai Days', 'Dhatu Organic Stores And Kitchen', "BIRYANI'S OF BHARAT", 'Patios - Progressive Vegetarian Kitchen', 'New Biryani Centre', 'Karavali Lunch Home', 'Giani', '02 Juice Bar', 'Parimala Sweets', 'Udupi Sri Krishna Vaibhava', 'Sri Sai Vasavi Tiffin Center', 'Karnataka state CO-OPERATIVE fisheries federation', 'Murli Military Hotel', 'V2 Prive Restaurant', 'Hotel 27Th Cross', 'Now Boarding Cafe', 'STEGI (Modern Indian Restaurant)', 'Once Upon a Rooftop', 'U.P. Style North Indian Food', 'Sukh Shahi Biryani']

Restaurants in K G CIRCLE, MAJESTIC: ['Chicken County Restaurant']

Restaurants in KHB Colony: ['Shivanna Biryani Hotel']

Restaurants in Kammanahalli/Kalyan Nagar: ['Pammi da Punjabi Dhaba']

Restaurants in Katriguppe: ['SUMUKHA HOME MADE FOODS']

Restaurants in Kesar Rajasthani Parotha Point: ['Kesar Rajasthani Parotha Point']

Restaurants in Koramangala: ['Chowman', "Sahana's (Since 1993)", 'IGP Cakes', 'Nano Duzi', 'Nomad Pizza - Traveller Series', 'Picante - Mexican by Nomad', 'ENSO - Sourdough Pizza by Nomad', 'Bamboo Heights', 'Dosa & Currys', 'Vkc Kafe', 'HM Cafe', 'Malabar Bay', 'Desir Cafe', 'Kai Pakkuvam', 'Muna Momos Corner']

Restaurants in LAKKASANDRA: ['Salem Mess']

Restaurants in LULU MALL: ['Samosa Singh']

Restaurants in Lal Bagh Road, Shanti Nagar: ['Era Scoops']

Restaurants in Lavelle Road: ["Sunny's", 'Goodness To Go', 'The Rice Bowl', 'Pizza Stop', 'The Fatty Bao', 'BOSS Burger', 'Cantan', 'SodaBottleOpenerWala', 'South Parade - The Chancery Hotel', 'Tree Tops Bar & Kitchen', 'Kaze', 'Matsuri - The Chancery Hotel']

Restaurants in M.c.layout: ['Snackopedia']

Restaurants in MAJESTIC: ['Bikaner Sweet']

Restaurants in MALLESHWARAM: ['The Brooklyn Creamery - Healthy Ice Cream']

Restaurants in MG Road: ['Lakeview Milk Bar', 'Tandoor | A Heritage Indian Restaurant & Bar', 'Temple of the Senses', 'NYX Lounge Cafe', 'Pinxx Royal Orchid Central', 'Ging-Royal Orchid Central']

Restaurants in Magadi Road: ['Taco Bell', 'Baskin Robbins Happyness Shakes', 'Gourmet Ice Cream Cakes by Baskin Robbins', 'South Ruchi']

Restaurants in Magrath Road: ['Shiv Sagar', 'Crazy Pizza', 'The Wok Co']

Restaurants in Majestic: ['Five Star Chicken', 'Cafe Amudham', 'Hotel Navayuga', 'Sri Vishnu Grand', 'Sangam Sweets', 'Fish Land', 'Basaveshwara Khanavali', 'Empire Juices and Desserts', 'Iyengars Bakery', 'Madno - House of Sundaes', 'Raj Restaurant', 'Boba Bar by Frozen Bottle', 'Hotel Empire', 'Everything Rice', 'Rasapaka', 'Bengaluru Donne Biriyanis', 'Bobby Ka Veg Dhaba', 'Shree Sagar Fast Food', 'New Govind Rao Military Hotel', 'THE TAJ HOTEL', 'Mirapakay Andhra Style', 'Adya Nati Style', 'Lassi Shop', 'Amrita Foods']

Restaurants in Malleshwaram: ['Chinese Wok', "Haldiram's Restaurant", 'IDC

Kitchen', 'Kritunga', 'Desi Masala', 'Namaste', 'Chaayos Chai+Snacks=Relax',  
 'Vijayalakshmi Veg', 'Hyderabadi Biryani Hotel', 'Biggies Burger', 'Punjabi  
 Dhaba', 'Hotel Prince', 'MTR', 'Shyamji's Chole Bhature', 'Malgudi's Donne  
 Biryani', 'Brahmins' Thatte Idli', 'Krispy Kreme', 'Gopizza', 'Kakal Kai  
 Ruchi', 'Shiv Sagar ( RS )', 'CTR Shri Sagar- Since 1920', 'Northwind  
 Restaurant', 'Suchi Ruchi', 'Juice Therapy', 'Istah - The Mediterranean Way',  
 'No Sugar Please, Sweets & Juices', 'Punjab Grill', 'Barbecue by Punjab Grill',  
 'Delights by INOX', 'Kings Kitchen', 'Asia Seven - Sizzling Chinese', 'Green  
 Chilly', 'Sanman Restaurant', 'New Samrat Restaurant', 'Priyadarshini  
 Restaurant', 'SUKH SAGAR ROYALE', 'Madurai Pandyan Mess', 'Mélange by Asha Sweet  
 Center', 'Super Spoon', 'Chandus deluxe (Naati style)', 'Namma Kudla Veg', 'SGS  
 Non Veg Gundu Palav - Malleshwaram Franchisee', 'Sai cafe veg',  
 'Restaurant1179', 'Tasty Paradise', 'Satvik Grand', 'Cafe Levista - Coffee Chai  
 And Snacks', 'Kolkata Famous Katti Rolls', 'New Fish Land', 'Vasavi Food Point  
 Mulabagilu Dosa', 'Asian Curry House', 'Rajdhani Thali', 'Himadri Ice Cream',  
 'Happy Hours', 'Rotti Mane Uk Foods', 'Green Donne Biryani and Kabab Center',  
 'Bangarpete Chats', 'The Waffle Man (From The House Of Cookieman)', 'Magic Wok -  
 Chinese Ka Tadka', 'Shree Ganesh Fruit Juice Centre', 'KK Tandoori rolls',  
 'Stories of Kitchen', 'Egg Rice Corner', 'SLV Delite', 'Desserted', 'Melts',  
 'Mammaslice', 'Flavour Restaurant Citadel Sarovar Portico', 'ATITHIS',  
 'Bhagyalakshmi Butter Gulkand Stores', 'MR.BB', 'The Sizzler Cafe', 'Kalmane  
 Koffees', 'Brahmins Bakery Grand', 'The Green Path', 'Bombay Special Vada Pav',  
 'Jagadhguru Basaveshwara Restaurant', 'Sri Angala Parameshwari Sugar Cane Juice  
 Bar', 'Balaji's cafe', 'Atlas World Cafe', 'Latitude', 'Boobacha', 'Karnataka  
 Biryani Point', 'R R Fruit Juice Center', 'Jalsa', 'Five Star', 'Pind  
 Balluchi', 'TOC- THE OOTY CHOCOLATES', 'Lovely Kitchen', 'BHAI RAVESHWARA  
 MILITARY HOTEL', 'Shree Organic World']  
 Restaurants in Malleshwaram: ['Abubakar Siddiq Hotel', 'Ganesh Food Joint']  
 Restaurants in Mount Joy Rd: ['Rolls Zone']  
 Restaurants in Mysore Road: ['LeanCrust Pizza- ThinCrust Experts', 'NH1 Bowls -  
 Highway To North', 'Imperial Restaurant Since 1954', 'BOX8 - Desi Meals', 'ZAZA  
 Mughal Biryani', 'Itminaan Matka Biryani - Slow Cooked', 'BOOM Sandwich - Sub of  
 India', 'Hola Pasta - Fresh Gourmet Pasta', 'GLOBO Ice Creams Of The World',  
 'New mayura restaurant']  
 Restaurants in Mysore road: ['Basaveshwara Uttara Karnataka Hotel']  
 Restaurants in NEAR CITY RAILWAY STATION: ['Pavana Restaurant']  
 Restaurants in Nagarbhavi: ['Ayodhya Food Line']  
 Restaurants in Nagawara: ['N.Razakhiya Hotel']  
 Restaurants in Outer Ring Road: ['Paradise Premium']  
 Restaurants in PES college Hanumanth nagar: ['Srinivasa Upahara']  
 Restaurants in RAJAJI NAGAR: ['Dum Safar Biryani']  
 Restaurants in RAJAJINAGAR: ['Boba Bhai', 'Seoul Mate Korean Burgers']  
 Restaurants in Race Course Road: ['Richie Rich', 'Sanadige by Goldfinch', 'South  
 Ruchis Square', 'Lush Renaissance Bengaluru Race Course Hotel By Marriott.']  
 Restaurants in Rajajinagar: ['Nandhana Palace', 'Grameen Kulfi', 'Asha Food  
 Camp', 'Kim Lee Restaurant', 'Hotel Udipi Ruchi', 'Happy Platter', 'Donne  
 Biryani Angadi Mane', 'Savi Sagar', 'Al-Bek', 'Paradise Biryani', 'Sweet  
 Chariot', 'New Shanti Sagar', 'Chickpet Donne Biryani House', 'FB Cakes',

'Swagat Restaurant', 'Bangarpet Chats', 'UBQ by Barbeque Nation', 'Barbeque Nation', 'The Purple Pan', 'Sree Banashankari Donne Biryani', 'Lulu Hypermarket', 'Chicking', 'Street Foods by Punjab Grill', 'Biryani House', 'Mubarak Restaurant', 'New Prakriti Deluxe', 'Lepcha's Restaurant', 'Sicilia Pont (Italian Restaurant)', 'Hotel Nalapaka', 'Swathi cafe', 'Maggi Mane', 'Karnataka biryani point', 'Biryani Canteen', '89 Express Dhaba', 'Rao's Mushroom Donne Biryani', 'Maruthi Restaurant', 'Shree Ganesh Fruit Juice', 'Frozen Delights', 'Chole Bhature And Parathas', 'Marwadi Chaat Tiffin Services', 'Bombay Bites', 'Anika Tiffin', 'Sana Kitchen', 'Sri Maruthi Hotel', 'LJ Iyengars Cakes N Cookies Sweets', 'Surya foods', 'MAST BANARASI PAAN', 'Shawarma and Grill House', '5 c Restobar', 'Beegara Mane Baadoota', 'Brownie Bites', 'DELHI WALA ROTI AUR SUBZI', 'Cotton Candy Station', 'New Ambur Special Dum Biryani', 'Kudla Beach', 'Antarastriya Momo Pasta', 'Nimma Darward Mane', 'Tummy Ticklers', 'Spicy Secrets', 'Naati Delights', 'Spices Food Joint', 'Vadoji', 'R.M.K Scoops N Juice', 'Chole Maharaj', 'Swaad Kitchen Mart', 'North Indian Rasoi', 'paneer shaneer', 'Soni's Cafe', 'Donut Hubb', 'Mr Buns And Grills', 'S L N Birayani & Kabab Center', 'Roast N Frost', 'Shivaji Kabab Center', 'NR Lunch Box', '1992 Chats Space', 'Joyful Pastries And Cakes', 'Full Moon Cafe', 'Loaded Pasta', 'Holige Mane', 'Veg Bro Chinese', 'NORTH INDIAN FOOD', 'Chillz and Grillz', 'HOTEL NUDI KANNADA', 'Onebite', 'Absolute Shawarma', 'Ipsha's Kitchen', 'Xoox Ice Creams', 'Hopinn Cafe', 'MM Hotel', 'Tandoor Chai Point', 'Lakshmi food point']

Restaurants in Rajajinagara: ['Herbe Bowl']

Restaurants in Rajarajeshwari Nagar: ['AJJI MANE BADOOTA']

Restaurants in Rashtriya Vidyalaya Rd: ['Makhani Darbar']

Restaurants in Reliance Fresh: ['Cakes By Flower Aura']

Restaurants in Residency Road: ['Wendy's Burgers', '1522 - The Pub', 'Coastal Machali Co', 'ITC Gardenia - Flavours', 'Bake N Bloom', 'K c kabab corner', 'Quattro']

Restaurants in Richmond Road: ['FreshMenu', 'Fanoos', 'Kentacky Chicken Corner', 'Simplifry', 'Cool Town']

Restaurants in Richmond Town: ['ITC Fabelle Chocolates', 'Bowl Soul', 'Edesia by Freshmenu', 'Taaka Chinese', 'DonBuri', 'Green Cravings', 'Nutribites', 'Parijata pure veg', 'Soroush Biryani']

Restaurants in S G Palya: ['Cravy Wings - the american diner']

Restaurants in S G palya: ['Cafe Lafa']

Restaurants in S.G Paliya: ['Cakes']

Restaurants in S.G. Palya: ['Juice Bar']

Restaurants in SOBHA MALL: ['Oye Kulcha!']

Restaurants in Sadashiv Nagar: ['New Agarwal Bhavan']

Restaurants in Sadashiva Nagar: ['Chung Wah']

Restaurants in Sampangi Rama Nagar: ['Boba Tree']

Restaurants in Seshadripuram: ['Sri Ganesha Bombay Vadapav Corner', 'Food Paradise', 'Myfroyoland - Premium Frozen Yogurt', 'Andhra Gunpowder', 'The Noodle Theory', 'Biryani Trip - Destination Hyderabad', 'Madras Meal Company', 'Homely', 'Ghee Tadka Khichdi', 'Soul Rasa', 'The Bowl Company', 'Paneer Singh & Chicken Khurana', 'Misu', 'Chetty's Corner', 'Chikpet Donne Biryani House Palace Guttahalli', 'Gullu's Chaat', 'Samudra Bar & Restaurant', 'Agni Sagar', 'Purani

Delhi', 'Shreyas Non Veg', 'HOTEL CHANDRU NIMMA MANE OOTA (NAATI STYLE)', 'New Bhimas Garden Veg', 'Big Bites']  
 Restaurants in Shanthi Nagar: ['Rajasthani Dhaba']  
 Restaurants in Shanthinagar: ['Kwality Walls Frozen Dessert and Ice Cream Shop', 'RajHans Restaurant']  
 Restaurants in Shanthinagara: ['Flames Restaurant', 'Coconut Grove']  
 Restaurants in Shanti Nagar: ['Swiss Cream - Ice Creams And More', 'Paratha House', 'Dakshin', 'Rolls Kitchen', 'Sri Udupi Grand Veg', 'Maachiz', 'The Bangalore Cafe', 'Desi Vdesi', 'Sri Jayalakshmi Bakery', 'Sanidhya Veg', 'Udta Punjab Cafe', 'Vyshali Food Corner', 'Dal Chawal Roti Sabji', 'Karavali Kolimane', 'Hatti Donne Biryani', 'Salasar Balaji Restaurant']  
 Restaurants in Shantinagar: ['Wow! China', 'Wow! Momo', 'Sreeraj Lassi Bar 1973S', 'Wendy's Flavor Fresh Burgers']  
 Restaurants in Sheshadripuram: ['Gundappa Donne Biryani']  
 Restaurants in Shivaji Nagar: ['Taj Hotel', 'Pizza Town', 'Pizza House', 'Pizza Box', 'Vinay Upahar', 'SR & Sons Bakery and Sweets']  
 Restaurants in Shivajinagar: ['Aubree', 'Minus 30', 'New Taj Darbar', 'Midnight Eats', 'US Pizza', 'Lassi and Juice', 'Savera Cafe', 'Cafe Zyke', 'Bangalore Thindies', 'Woody's', 'Dawat Durbar', 'Shalimaar family restaurant', 'S.S.S Snacks', 'Sultan's Shahi Darbar', 'Roll Master', 'Kingsway restaurant']  
 Restaurants in Sobha Mall, St. Marks Road: ['Tadka Singh']  
 Restaurants in Sobha Mall, St.Marks Road: ['Mom Made', 'Bowl Baby Bowl']  
 Restaurants in Srinivasa Brahmins Bakery: ['Srinivasa Brahmins Bakery']  
 Restaurants in St Marks Road: ['Pure Punjabi Dhaba']  
 Restaurants in St. Marks Road: ['Truffles', 'No 10 Fort Cochin', 'Lavonne', 'Burger Seigneur', 'Brassa', 'Hard Rock Cafe', 'Raahi', 'The Bar Stock Exchange']  
 Restaurants in St. Marks road: ['Old Madras Baking Company']  
 Restaurants in Sudham Nagar: ['Dynasty Lounge Bar & Restaurants']  
 Restaurants in Swaroop Nagar: ['Bake and Juice']  
 Restaurants in Tavarekere: ['Magic chef', 'Just Sandwich', 'Anda Ka Funda']  
 Restaurants in UB City: ['Salt - Indian Restaurant Bar & Grill']  
 Restaurants in V V Puram: ['Khichdi Bar']  
 Restaurants in VIJAYNAGAR: ['Cream Stone Ice Cream']  
 Restaurants in VV Puram: ['Daily Kitchen - Homely Meals']  
 Restaurants in Vasanth Nagar: ['Great Indian Khichdi by EatFit', 'Bakingo', 'Ghee and Turmeric', 'Sundae Everyday Ice Creams', 'Slurpy Shakes', 'Miller's 46', 'WarmOven Cake & Desserts', 'The Food Corner', 'Kaati Zone Rolls & Wraps', 'The Dessert Zone', 'Burger It Up', 'Momo Zone - The Momo Company', 'Indiana Burgers', 'Cupcake Bliss Cake & Desserts', 'Kouzina Kafe - The Food Court', 'Shezan', 'Hotel Chandrika', 'Swathi Grand', 'Carols pastries and bakers', 'Chinese Hot', 'Paivihar', 'Grand Foodies Restaurant', 'Ketogenic Foods', 'Vegan kitchen', 'Deli2Go', 'Puppy's Gastronomy']  
 Restaurants in Vasanthanagar: ['The Betel Leaf Co - PAAN Originally from Bangalore']  
 Restaurants in Vasanthnagar: ['Boba cafe - A true bubble tea']  
 Restaurants in Vijay Nagar: ['Baskin Robbins - Ice Cream Desserts', 'Onesta', 'Shree Cool Point', 'Hot n spicy adda', 'Goloo Chaats Corner', 'Aahar', 'Hot

Coffee', 'Naadoota']

Restaurants in Vijayanagar: ['Chikpet Donne Biryani House - Vijayanagar', 'MEGHANA BIRYANI', 'Krishna Vaibhava', 'Hotel Prakruthi', 'New Shanthi Sagar(Old) - Hosahalli Metro Station', 'Nisarga', 'Hotel Ngt Non Veg', 'Swathi Greenland', 'Cake Bite', 'Rajanna Military Hotel', 'Big Bite', 'Rotti Mane', 'Ambur Hot Dum Biryani', 'Lassi Corner', 'Sai Prasad', 'Mangalore Kitchen', 'PVR Cafe', 'FNP Cakes By Ferns N Petals', 'Sri Durga Chats and Icecream Parlour Vijayanagar Since 1996', 'Ice Fort', 'Ayodhya Cafe', 'Vijaynagar Vaibhav', 'DBD - Davangere Benne Dose', 'Gandharva Sip N Dine', 'Yummy Sip N Bites', 'Mandya Nati Style', 'Vijayanagar Mandipete Palav', 'South Stories', 'Savji's Roll 'N' Biryani', 'Brothers Biryani', 'Park View', 'Thanco's Natural Ice Creams', 'Egg Adda', 'S.S. AMBUR DUM BIRIYANI', 'South Delicacy Veg', 'Sri Guru Kottureshwara Butter Dosa', 'Hyperscoop Natural and Premium Ice Cream', 'Fries Factory', 'Nuthan Foods Since 2023', 'Karavali Fish Land', 'Wow Waffle', 'Just Cakes', 'Prashanth Hotel', 'Baker's pride', 'Happy tummy', 'South Express', 'Shivara Thindi', 'Mandya Egga Rice Corner', 'Vijaya Karadant', 'Mavalli Biryani', 'Cherish Pizzeria', 'Malnad Donne Biryani Mdb', 'Karavali Food Land', 'Mangalore Magic', 'Ragini Snacks Cafe', 'Chaavadi', 'The Pastry Cafe', 'Shankaranna Military Hotel', 'Mandya Biryani Center', 'Bhairaveshwara Kabab Centre Nati Style', 'Time To Taste Cafe', 'Smoked BBQ Taxi', 'South Holige Mane', 'SUN KISH CAFE', 'CAFE 22', 'Drink And Dine', 'Metro Food court', 'Sri Durga Kitchen Cafe (Home-made food) Since 1996', 'HungryMo', 'Egg Point', 'Five Star Chicken', 'TREATY HUB', 'BDBD Banashri Davanagere Benne Dose Hotel', 'Ramanna Hotel', 'Shree Krishna Vaibhava', 'Kabab Magic center', 'Pooja Ice Creams', 'Indraprastha Vegetarian', 'Wodeyars Biryani', 'Punyashree Nati Style', 'Cafe' Levista', 'PIZZAMMA', 'Pista House', 'SHREE VASAVI BANGARPETE CHATS', 'Yummy Veg Vibes', 'Bombat Dosa', 'Ice Park', 'Shree Ambha Bhavani Pakka Home Made', 'Shashi Thatte Idly', 'Pallavi Ootada Mane', 'Gulbarga Famous Shivaji Khanwali', 'Hoskote dum biryani']

Restaurants in Vijaynagar: ['Gowdas Biryani Corner Nati Style']

Restaurants in Vijyanagar: ['Sattva']

Restaurants in Vishweshwarapura: ['Bhole Ke Chole']

Restaurants in Vittal Mallaya: ['Amadora Gourmet Ice Cream']

Restaurants in Vittal Mallya Road: ['Cafe Noir', 'ROYCE' Chocolate', 'Shiro', 'Sriracha', 'Sanchez', 'Provenance Gourmet Gifts', 'Farzi Cafe', 'The Biere Club', 'Badmaash']

Restaurants in Wilson Garden: ['Sandwich Guru', 'Juice Junction', 'Uttara Karnataka Jolada Rotti Mattu Chapati Angadi', 'Karavali Mane', 'Simply Meal']

Restaurants in Yelahanka: ['Chinese Food Co.']

Restaurants in central bangalore: ['Love and Crumble']

Restaurants in chick bazaar road,old cemetery road ,opp to Elaf w: ['Bilquees home kitchen']

Restaurants in hanumanthnagar: ['The Chat Shop']

Restaurants in korangalore adugodi: ['Spice Is Nice']

Restaurants in wilsion garden: ['Subbana's Biryani']

```
[419]: df_cleaned['location'].nunique()
```

[419]: 147

There are **147 unique locations** represented in the dataset. This indicates the geographical diversity of the restaurants covered in the data.

## 12 Distribution of Ratings for each Location

```
[453]: import math
import matplotlib.pyplot as plt
import seaborn as sns

# Calculate the number of unique locations and the number of rows needed
num_locations = df_cleaned['location'].nunique()
num_rows = math.ceil(num_locations / 3) # Changed from 3 to 4 plots per row

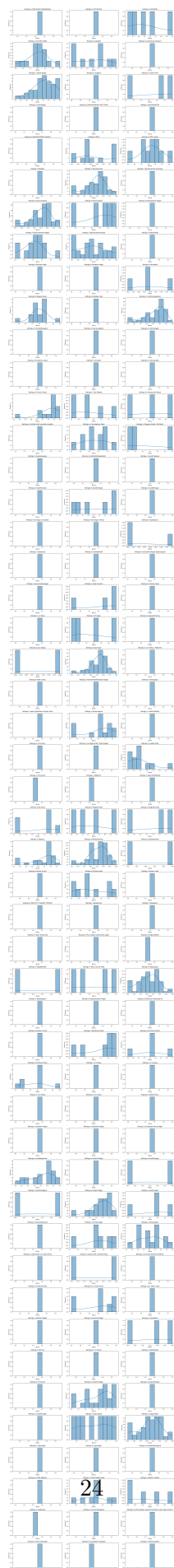
# Create subplots with the appropriate number of rows and columns
fig, axes = plt.subplots(nrows=num_rows, ncols=3, figsize=(16, 3 * num_rows))
    ↪ # Adjusted figsize

# Flatten the axes array for easier indexing
axes = axes.flatten()

# Iterate over locations and create histograms
for i, (location, group) in enumerate(df_cleaned.groupby('location')):
    ax = axes[i]
    sns.histplot(group['rating'], bins=10, kde=True, ax=ax)
    ax.set_title(f'Ratings in {location}', fontsize=10) # Reduced font size
    ax.set_xlabel('Rating', fontsize=8)
    ax.set_ylabel('Frequency', fontsize=8)
    ax.tick_params(labelsize=8) # Reduced tick label size

# Hide any unused subplots
for j in range(i + 1, num_rows * 3):
    fig.delaxes(axes[j])

# Adjust layout and display the plot
plt.tight_layout()
plt.show()
```





### Interpretation of Histogram Plots for Ratings by Location:

**Overall Trend:** - The majority of restaurants across different locations tend to have ratings clustered around 4.0 and above. - This suggests a generally positive customer experience with Swiggy's listed restaurants.

**Location-Specific Observations:** - Some locations exhibit a more concentrated distribution of ratings, indicating greater consistency in restaurant quality. - Other locations show a wider spread of ratings, suggesting a greater variety in dining experiences.

## 13 Exploring the distribution of restaurants across different locations

```
[421]: # Explore the distribution of restaurants across different locations
location_counts = df_cleaned['location'].value_counts()

# Analyze which locations have the highest-rated restaurants
location_avg_rating = df_cleaned.groupby('location')['rating'].mean().
    ↪sort_values(ascending=False)

# Compare delivery times and ratings by location
# Clean the 'delivery_time' column to extract the minimum time
# Convert 'delivery_time' to string type before using .str
df_cleaned['min_delivery_time'] = df_cleaned['delivery_time'].astype(str).str.
    ↪extract('(\d+)-').astype(float).astype('Int64')

# Group data by location to get average rating and average delivery time
location_delivery_time_rating = df_cleaned.groupby('location').agg(
    avg_rating=('rating', 'mean'),
    avg_delivery_time=('min_delivery_time', 'mean'),
    count=('restaurant_name', 'count')
).sort_values(by='avg_rating', ascending=False)

# Print the top results
print("Top 5 Locations by Number of Restaurants:")
print(location_counts.head())
```

Top 5 Locations by Number of Restaurants:

location	
Jayanagar	233
Basavanagudi	187
Banashankari	139
Central Bangalore	114
Vijayanagar	92

Name: count, dtype: int64

```
[422]: print("\nTop 5 Locations by Average Rating:")
print(location_avg_rating.head())
```

```
Top 5 Locations by Average Rating:
location
Lal Bagh Road, Shanti Nagar    5.0
KHB Colony                    5.0
S.G. Palya                    5.0
Girinagar 1st phase           4.9
central bangalore             4.8
Name: rating, dtype: float64
```

```
[423]: print("\nTop 5 Locations by Average Rating with Delivery Time:")
print(location_delivery_time_rating.head())
```

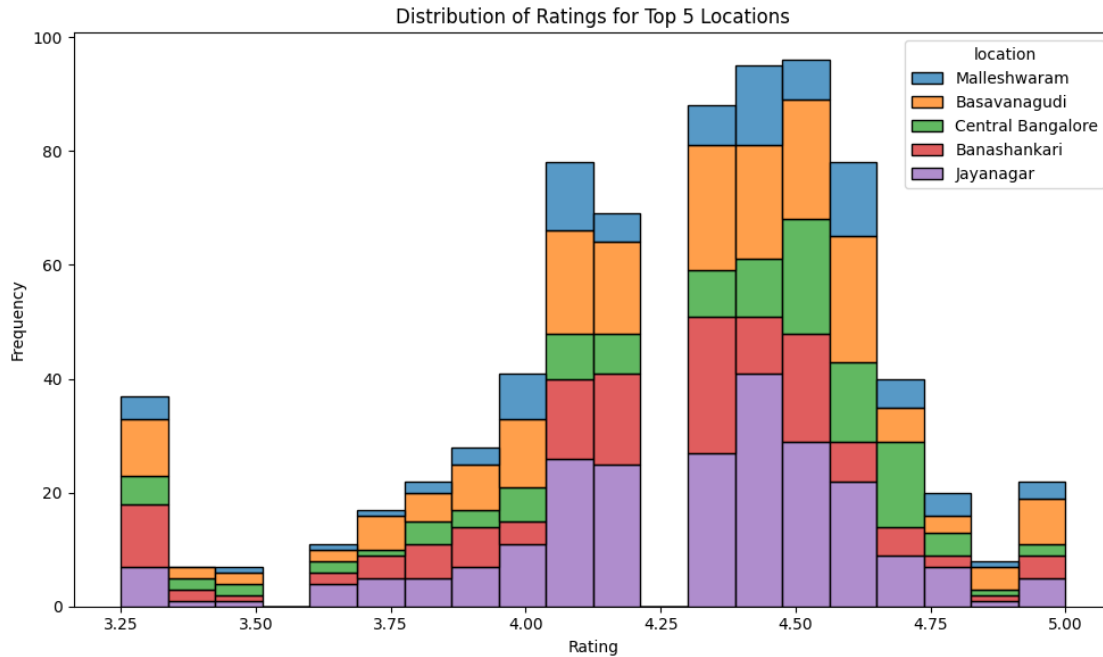
```
Top 5 Locations by Average Rating with Delivery Time:
              avg_rating  avg_delivery_time  count
location
Lal Bagh Road, Shanti Nagar    5.0          <NA>     1
KHB Colony                    5.0          <NA>     1
S.G. Palya                    5.0          <NA>     1
Girinagar 1st phase           4.9          <NA>     1
central bangalore             4.8          <NA>     1
```

#Distribution of Ratings for Top Locations

```
[424]: # Create subplots
fig, ax = plt.subplots(figsize=(10, 6)) # Single plot

# Plot distribution of ratings for the top 5 locations
sns.histplot(data=df_top_5, x='rating', hue='location', multiple='stack', ax=ax)
ax.set_title('Distribution of Ratings for Top 5 Locations')
ax.set_xlabel('Rating')
ax.set_ylabel('Frequency')

# Adjust layout and display the plot
plt.tight_layout()
plt.show()
```



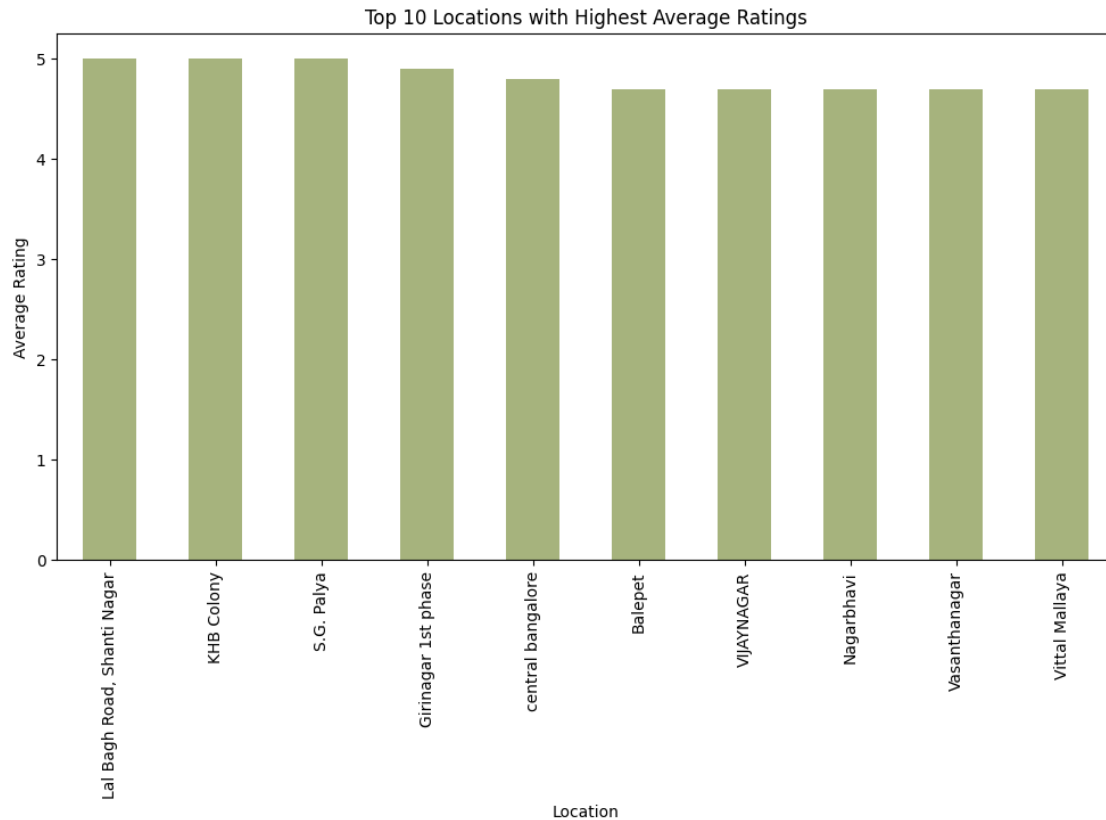
### Key Observation:

#### *Restaurant Distribution:*

Certain locations like Jayanagar and Basavanagudi have a high concentration of restaurants, indicating they are popular dining areas.

## 14 The Average Rating by Location (top locations)

```
[425]: # Plot the average rating by location (top 10 locations)
plt.figure(figsize=(12, 6))
location_avg_rating.head(10).plot(kind='bar', color='#A6B37D')
plt.title('Top 10 Locations with Highest Average Ratings')
plt.xlabel('Location')
plt.ylabel('Average Rating')
plt.xticks(rotation=90)
plt.show()
```



## Key Observation:

### *Highest-Rated Locations:*

Locations such as KHB Colony and S.G. Palya have the highest average ratings, though they have only one or very few restaurants, which can skew the results.

## 15 Cuisine Analysis:

```
[426]: import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Explore unique cuisines (split by comma and strip whitespace)
unique_cuisines = df_cleaned['cuisine'].str.split(',').explode().str.strip().
    ↪unique()
print("Unique Cuisines:", unique_cuisines)
```

```
Unique Cuisines: ['Chinese' 'Asian' 'Tibetan' 'Desserts' 'Burgers' 'Salads'
'Snacks'
'Beverages' 'Pizzas' 'Biryani' 'Andhra' 'South Indian' 'North Indian'
'Ice Cream' 'Home Food' 'Indian' 'Healthy Food' 'Rajasthani']
```

```
[427]: # prompt: generate word cloud

from wordcloud import WordCloud, STOPWORDS
# Generate a word cloud for cuisines
cuisine_text = " ".join(df_cleaned['cuisine'].dropna())
stopwords = set(STOPWORDS)
wordcloud = WordCloud(width=800, height=400, background_color='white',
    stopwords=stopwords).generate(cuisine_text)

# Display the generated image:
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis("off")
plt.show()
```



## 16 Determine the most popular cuisines

```
[428]: # We need to split the 'cuisine' column into individual cuisines first
cuisine_exploded = df_cleaned['cuisine'].str.split(',', expand=True).stack().
    ↪str.strip()
cuisine_counts = cuisine_exploded.value_counts()

# Analyze the relationship between cuisine type and average rating
cuisine_ratings = df_cleaned.explode('cuisine')
cuisine_ratings['cuisine'] = cuisine_ratings['cuisine'].str.strip()
cuisine_avg_rating = cuisine_ratings.groupby('cuisine')['rating'].mean().
    ↪sort_values(ascending=False)

# Identify which cuisines have the highest or lowest average ratings
highest_rated_cuisines = cuisine_avg_rating.head(10)
lowest_rated_cuisines = cuisine_avg_rating.tail(10)

# Print the results
print("Top 5 Most Popular Cuisines:")
print(cuisine_counts.head())
```

Top 5 Most Popular Cuisines:

Chinese	414
Beverages	357
Desserts	333
South Indian	322
North Indian	308

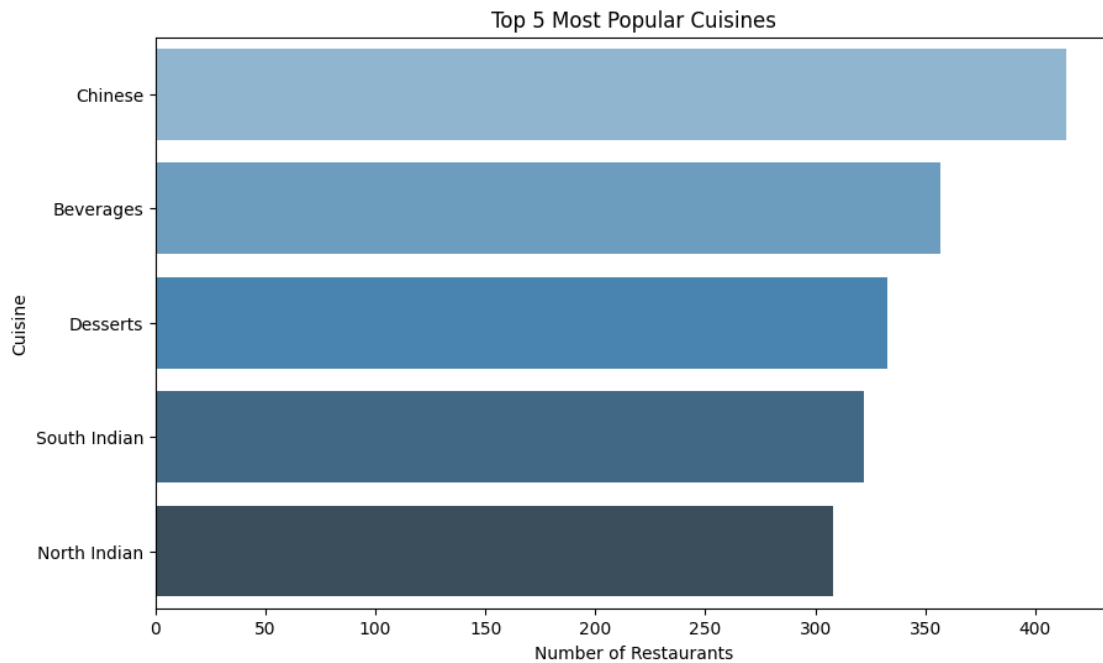
Name: count, dtype: int64

```
[429]: # Plotting the Top 5 Most Popular Cuisines
plt.figure(figsize=(10, 6))
sns.barplot(x=cuisine_counts.head(5).values, y=cuisine_counts.head(5).index,
    ↪palette='Blues_d')
plt.title('Top 5 Most Popular Cuisines')
plt.xlabel('Number of Restaurants')
plt.ylabel('Cuisine')
plt.show()
```

<ipython-input-429-871bc1156555>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=cuisine_counts.head(5).values, y=cuisine_counts.head(5).index,
palette='Blues_d')
```



### Key Observation:

The plot shows the dominance of Chinese cuisine. Chinese food appears to be the most popular cuisine type, with significantly more restaurants offering it compared to any other cuisine in the top 5 list.

```
[430]: print("\nTop 10 Highest Rated Cuisines:")
print(highest_rated_cuisines)
```

Top 10 Highest Rated Cuisines:

cuisine	
Ice Cream, Beverages, Fast Food	5.0
Chinese, Burgers, Momos, Snacks, Fast Food, Pastas	5.0
South Indian, Indian, Home Food, Healthy Food	5.0
Ice Cream, Snacks, Beverages	5.0
Desserts, Beverages, Ice Cream, Ice Cream Cakes	5.0
Chinese, Continental, Desserts, Oriental	5.0
Continental, Fast Food, Burgers	5.0
Snacks, Cafe	5.0
Beverages, Pizzas, Burgers, Cafe	5.0
North Indian, Chinese, Chaat, Snacks	5.0

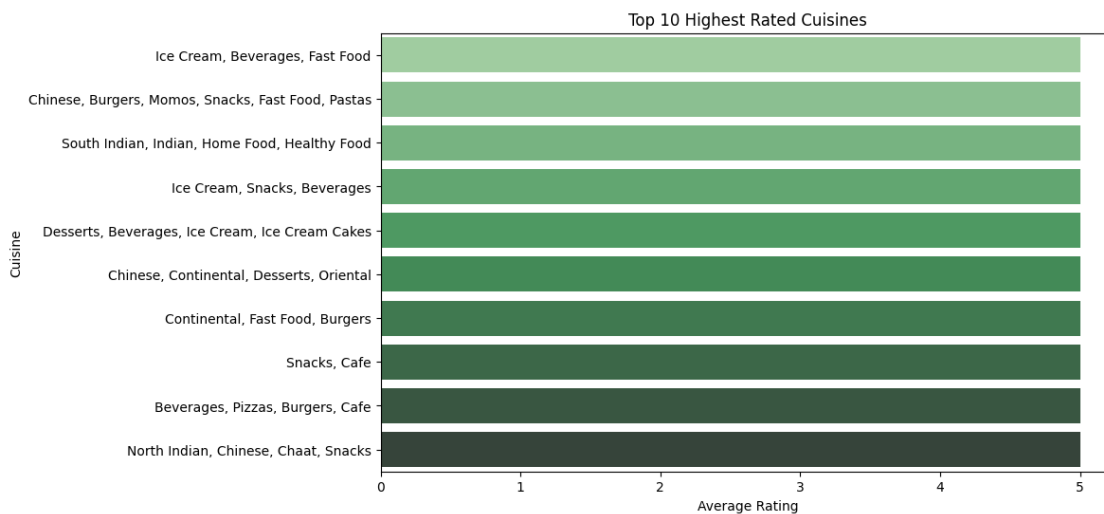
Name: rating, dtype: float64

```
[431]: # Plotting the Top 10 Highest Rated Cuisines
plt.figure(figsize=(10, 6))
sns.barplot(x=highestRatedCuisines.values, y=highestRatedCuisines.index,
            palette='Greens_d')
plt.title('Top 10 Highest Rated Cuisines')
plt.xlabel('Average Rating')
plt.ylabel('Cuisine')
plt.show()
```

<ipython-input-431-af2175dad453>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=highestRatedCuisines.values, y=highestRatedCuisines.index,
            palette='Greens_d')
```



```
[432]: print("\nTop 10 Lowest Rated Cuisines:")
print(lowestRatedCuisines)
```

Top 10 Lowest Rated Cuisines:

cuisine

Chinese, Indian, Biryani, Snacks, Burgers

3.25

Maharashtrian, Biryani, Indian

3.25

Chinese, Biryani, Kerala, Indian, Ice Cream, Home Food, Healthy Food, Fast Food, Burgers, Cafe 3.25



```

Street Food, Fast Food, Beverages
3.25
Chinese, Beverages, Fast Food, Burgers
3.25
North Indian, Biryani, Chinese, Indian
3.25
Fast Food, Burgers
3.25
North Indian, Thalís, Salads, Sweets
3.25
Pizzas, Burgers, Fast Food
3.25
Snacks, Punjabi, North Indian
3.25
Name: rating, dtype: float64

```

```

[433]: # Plotting the Top 10 Lowest Rated Cuisines
plt.figure(figsize=(10, 6))
sns.barplot(x=lowestRatedCuisines.values, y=lowestRatedCuisines.index,
            palette='Reds_d')
plt.title('Top 10 Lowest Rated Cuisines')
plt.xlabel('Average Rating')
plt.ylabel('Cuisine')
plt.show()

```

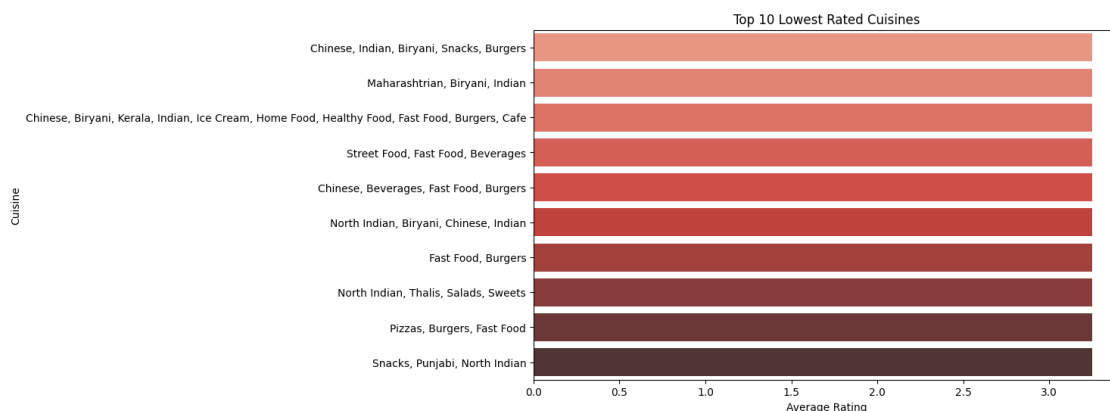
<ipython-input-433-ab580b9ffc34>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```

sns.barplot(x=lowestRatedCuisines.values, y=lowestRatedCuisines.index,
            palette='Reds_d')

```



```
[434]: # Group cuisines (tailored based on domain knowledge)
cuisine_group = {
    'Indian': ['North Indian', 'South Indian', 'Biryani', 'Thali', 'Andhra',
    ↪ 'Tandoor', 'Mughlai', 'Hyderabadi', 'Kebab', 'Chettinad'],
    'Chinese': ['Chinese', 'Indo Chinese', 'Szechuan', 'Cantonese'],
    'Italian': ['Italian', 'Pizza', 'Pasta', 'Risotto', 'Lasagna'],
    'Fast Food': ['Burger', 'American', 'Snacks', 'Sandwiches', 'Fries', 'Hot
    ↪ Dog'],
    'Desserts': ['Desserts', 'Bakery', 'Ice Cream', 'Confectionery', 'Pastry',
    ↪ 'Cupcakes'],
    'Middle Eastern': ['Middle Eastern', 'Lebanese', 'Turkish', 'Shawarma',
    ↪ 'Falafel'],
    'Mexican': ['Mexican', 'Tacos', 'Burritos', 'Quesadilla'],
    'Japanese': ['Japanese', 'Sushi', 'Ramen', 'Tempura'],
    'Thai': ['Thai', 'Pad Thai', 'Thai Curry'],
    'Continental': ['Continental', 'European', 'Steak', 'Grill'],
    'Mediterranean': ['Mediterranean', 'Greek', 'Spanish', 'Italian'],
    'Asian': ['Asian', 'Pan Asian', 'Vietnamese', 'Malaysian', 'Korean',
    ↪ 'Thai'],
    'Healthy': ['Healthy Food', 'Salads', 'Organic', 'Diet Food'],
    'Seafood': ['Seafood', 'Fish', 'Crab', 'Prawn', 'Sushi'],
    'Beverages': ['Beverages', 'Coffee', 'Tea', 'Juices', 'Smoothies',
    ↪ 'Shakes'],
    'Barbecue': ['Barbecue', 'BBQ', 'Grill'],
    'Indian Sweets': ['Indian Sweets', 'Mithai', 'Halwa', 'Rasgulla', 'Gulab
    ↪ Jamun'],
    'Pizza': ['Pizza', 'Italian Pizza', 'American Pizza', 'New York Pizza'],
    'Vegan': ['Vegan', 'Vegetarian', 'Plant-Based'],
    'Breakfast': ['Breakfast', 'Brunch', 'Morning Bites'],
    'South American': ['South American', 'Brazilian', 'Argentinian'],
    'Fusion': ['Fusion', 'Indo-Fusion', 'Asian Fusion'],
}
```

```
[435]: # Add a 'cuisine_group' column to the DataFrame
df_cleaned['cuisine_group'] = df_cleaned['cuisine'].apply(lambda x: next((group
    ↪ for group, cuisines in cuisine_group.items() if x in cuisines), None))

# Further analysis (example - average rating by cuisine group)
average_rating_by_cuisine = df_cleaned.groupby('cuisine_group')['rating'].
    ↪ mean().sort_values(ascending=False)
print("\nAverage Rating by Cuisine Group:\n", average_rating_by_cuisine)
```

Average Rating by Cuisine Group:

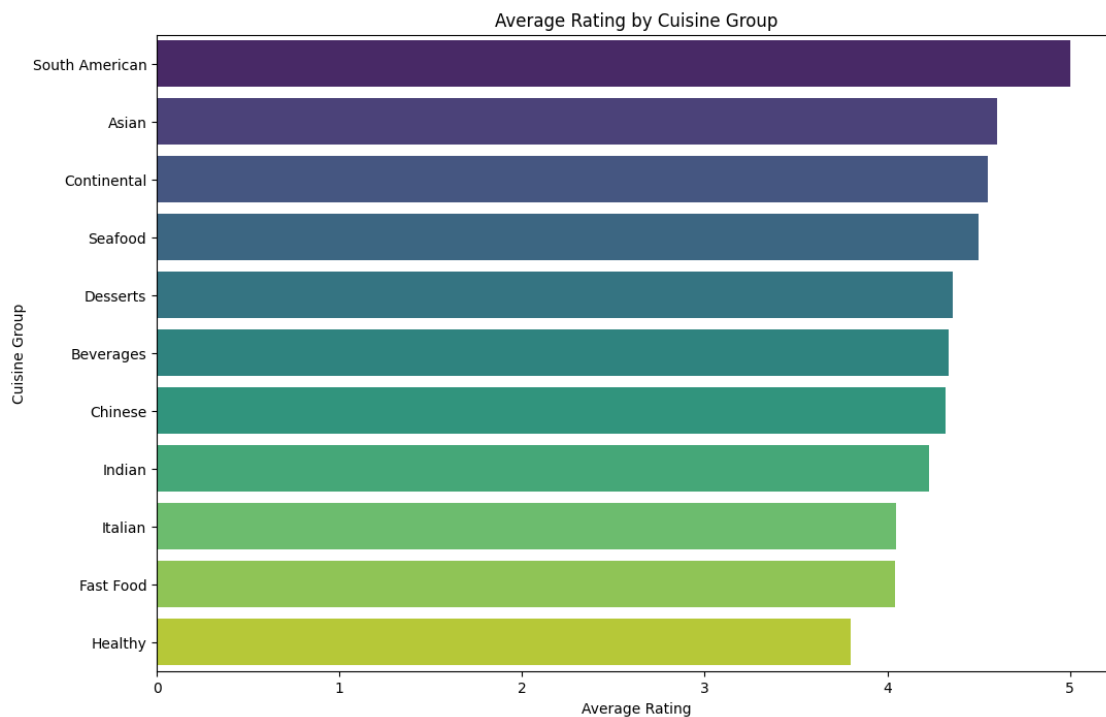
cuisine_group	
South American	5.000000
Asian	4.600000

Continental	4.550000
Seafood	4.500000
Desserts	4.355714
Beverages	4.336538
Chinese	4.316071
Indian	4.229204
Italian	4.050000
Fast Food	4.043333
Healthy	3.800000

Name: rating, dtype: float64

```
[436]: # Calculate average rating by cuisine group
average_rating_by_cuisine = df_cleaned.groupby('cuisine_group')['rating'].
    ↪mean().sort_values(ascending=False)

# Plotting the average ratings
plt.figure(figsize=(12, 8))
sns.barplot(x=average_rating_by_cuisine.values, y=average_rating_by_cuisine.
    ↪index, hue=average_rating_by_cuisine.index, palette='viridis', legend=False)
    ↪# Set hue and disable legend
plt.title('Average Rating by Cuisine Group')
plt.xlabel('Average Rating')
plt.ylabel('Cuisine Group') # Add y-axis label
plt.show()
```



Observation:

High-Rated Cuisines: - South American, Mexican, Healthy and Continental cuisines stand out with the highest average ratings, suggesting a premium dining experience and potential for higher customer satisfaction.

Competitive Landscape: - Chinese and Indian cuisines, despite being popular, have average ratings slightly below the top contenders, indicating a more competitive market with varying restaurant quality.

Opportunity for Improvement: - Barbecue food options, while gaining traction, have a relatively lower average rating, highlighting a potential area for improvement in terms of taste and customer experience.

```
[437]: # Get unique cuisine groups
cuisine_groups = df_cleaned['cuisine_group'].unique()

# Calculate the number of rows needed
num_cuisines = len(cuisine_groups)
num_cols = 4
num_rows = (num_cuisines + num_cols - 1) // num_cols # Calculate number of
↳rows needed

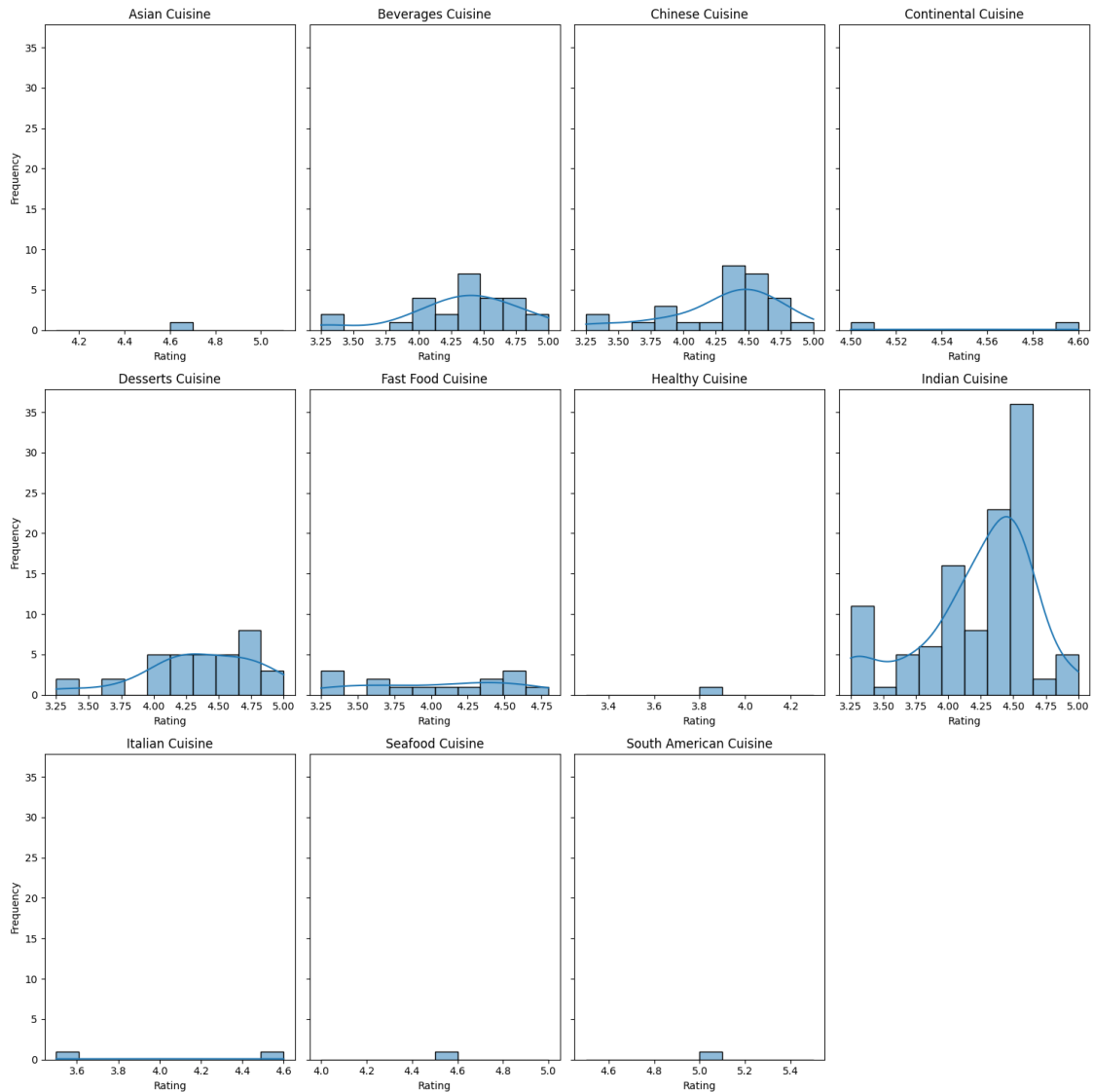
# Create a figure with the appropriate number of rows and columns
fig, axes = plt.subplots(num_rows, num_cols, figsize=(15, 5 * num_rows),
↳sharey=True)

# Flatten axes array for easy iteration
axes = axes.flatten()

# Iterate through each cuisine group and plot
for i, (cuisine_group, data) in enumerate(df_cleaned.groupby('cuisine_group')):
    sns.histplot(data['rating'], bins=10, kde=True, ax=axes[i])
    axes[i].set_title(f'{cuisine_group} Cuisine')
    axes[i].set_xlabel('Rating')
    axes[i].set_ylabel('Frequency')

# Turn off unused subplots
for j in range(i + 1, len(axes)):
    axes[j].axis('off')

# Adjust layout
plt.tight_layout()
plt.show()
```

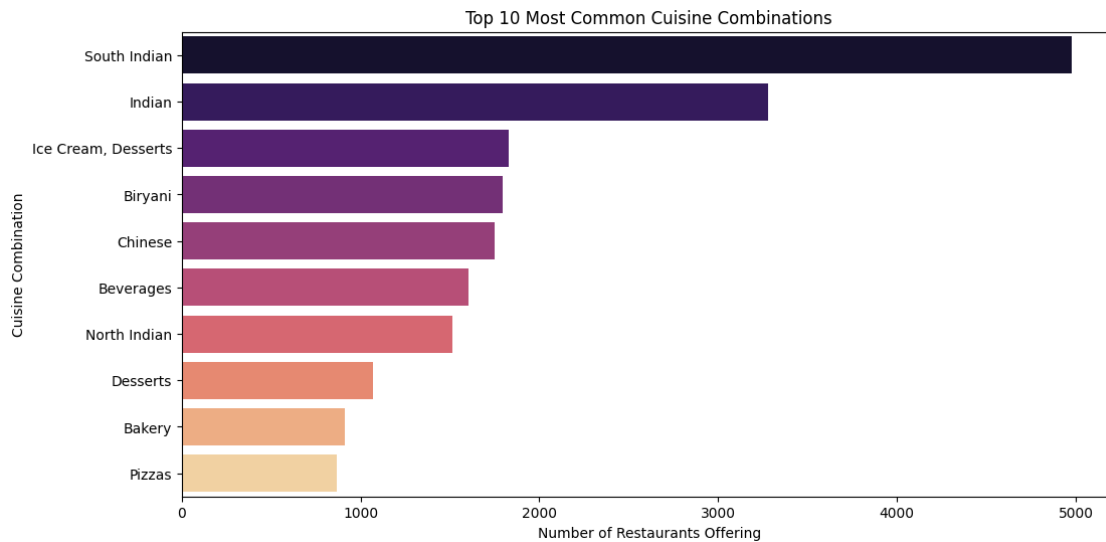


## 17 Cuisine Combinations based on the Orders:

```
[438]: # Analyze the most common cuisine combinations
cuisine_combinations = df['cuisine'].value_counts().head(10)

# Plot the top 10 cuisine combinations
plt.figure(figsize=(12, 6))
sns.barplot(x=cuisine_combinations, y=cuisine_combinations.index,
            hue=cuisine_combinations.index, palette='magma', legend=False)
plt.title('Top 10 Most Common Cuisine Combinations')
plt.xlabel('Number of Restaurants Offering')
plt.ylabel('Cuisine Combination')
```

```
plt.show()
```



A notable observation from this plot is the clear dominance of **South Indian** cuisine. It stands out significantly as the most common cuisine type, offered by nearly twice as many restaurants as the next most popular category (generic “Indian” cuisine). This suggests a strong regional preference or cultural influence favoring South Indian food in the area represented by this data.

#### #Key Insights from Swiggy Data Analysis:

- **High Average Ratings:** Restaurants on Swiggy generally receive positive reviews, indicating good customer satisfaction.
- **Popular Cuisines:** Chinese and South Indian cuisines are dominant, reflecting local preferences.
- **Cuisine and Rating:** South American, Mexican, and Healthy cuisines stand out with higher average ratings.
- **Location Matters:** Certain locations have a higher concentration of restaurants and higher average ratings.
- **Opportunity for Improvement:** Barbecue cuisine shows potential for improvement in customer satisfaction.

#### #FIVE ALGORITHMS IMPLEMENTED:

- Data Preparation

```
[439]: from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder

# Select features and target variable
features = df_cleaned[['cuisine', 'location', 'delivery_time']]
```

```

target = df_cleaned['rating']

# Encode categorical variables
label_encoder = LabelEncoder()
features.loc[:, 'cuisine'] = label_encoder.fit_transform(features['cuisine'])
features.loc[:, 'location'] = label_encoder.fit_transform(features['location'])

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(features, target,
    ↪test_size=0.3, random_state=42)

```

### 1. Simple Linear Regression:

```

[440]: from sklearn.linear_model import LinearRegression

# Feature and target selection for Simple Linear Regression
X_simple = df_cleaned[['delivery_time']]
y = df_cleaned['rating']

# Split the data
X_train_simple, X_test_simple, y_train_simple, y_test_simple =
    ↪train_test_split(X_simple, y, test_size=0.3, random_state=42)

# Initialize and train the model
simple_lr_model = LinearRegression()
simple_lr_model.fit(X_train_simple, y_train_simple)

# Make predictions
y_pred_simple_lr = simple_lr_model.predict(X_test_simple)

# Evaluate the model
mse_simple_lr = mean_squared_error(y_test_simple, y_pred_simple_lr)
r2_simple_lr = r2_score(y_test_simple, y_pred_simple_lr)

print(f'Simple Linear Regression MSE: {mse_simple_lr:.4f}')
print(f'Simple Linear Regression R2: {r2_simple_lr:.4f}')

```

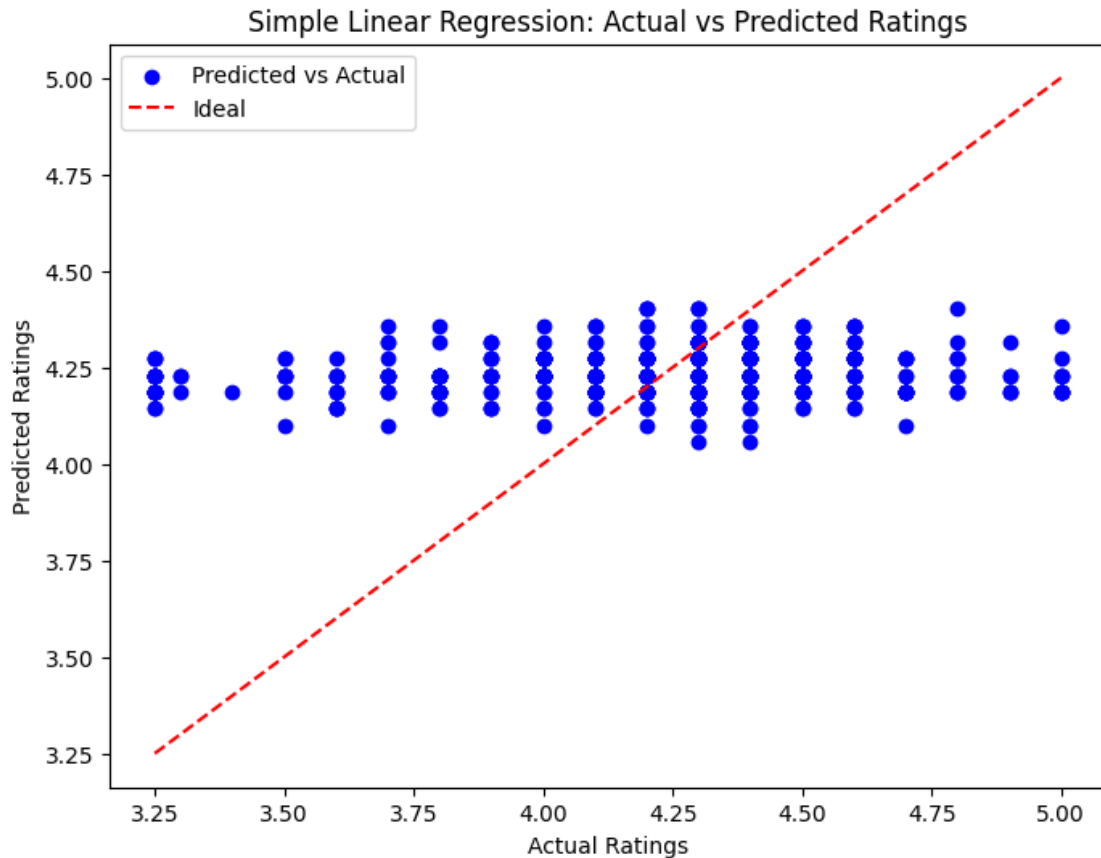
Simple Linear Regression MSE: 0.1495  
Simple Linear Regression R2: 0.0162

```

[441]: # Plot for Simple Linear Regression
plt.figure(figsize=(8, 6))
plt.scatter(y_test_simple, y_pred_simple_lr, color='blue', label='Predicted vs
    ↪Actual')
plt.plot([min(y_test_simple), max(y_test_simple)], [min(y_test_simple),
    ↪max(y_test_simple)], color='red', linestyle='--', label='Ideal')
plt.xlabel('Actual Ratings')

```

```
plt.ylabel('Predicted Ratings')
plt.title('Simple Linear Regression: Actual vs Predicted Ratings')
plt.legend()
plt.show()
```



This model has a very low  $R^2$  value, close to 0, indicating that `delivery_time` alone is not a good predictor of rating. The MSE is relatively low, but the poor  $R^2$  suggests that the model does not explain much of the variance in the ratings.

## 2. Multiple Linear Regression:

```
[442]: # Feature and target selection for Multiple Linear Regression
X = features # Already defined earlier with encoded 'cuisine' and 'location'
y = df_cleaned['rating']

# Split the data
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
    random_state=42)

# Initialize and train the model
```



```

multiple_lr_model = LinearRegression()
multiple_lr_model.fit(X_train, y_train)

# Make predictions
y_pred_multiple_lr = multiple_lr_model.predict(X_test)

# Evaluate the model
mse_multiple_lr = mean_squared_error(y_test, y_pred_multiple_lr)
r2_multiple_lr = r2_score(y_test, y_pred_multiple_lr)

print(f'Multiple Linear Regression MSE: {mse_multiple_lr:.4f}')
print(f'Multiple Linear Regression R2: {r2_multiple_lr:.4f}')

```

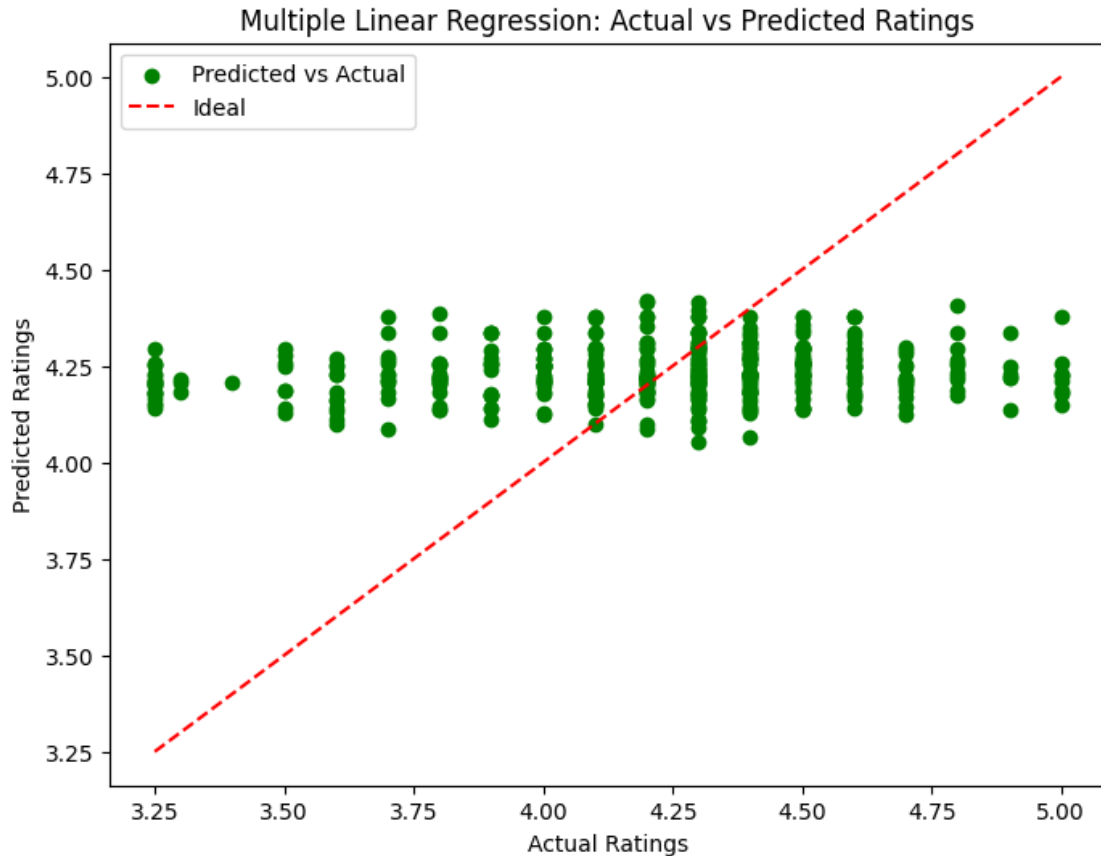
Multiple Linear Regression MSE: 0.1493

Multiple Linear Regression R2: 0.0174

```

[443]: # Plot for Multiple Linear Regression
plt.figure(figsize=(8, 6))
plt.scatter(y_test, y_pred_multiple_lr, color='green', label='Predicted vs_
↪Actual')
plt.plot([min(y_test), max(y_test)], [min(y_test), max(y_test)], color='red',
↪linestyle='--', label='Ideal')
plt.xlabel('Actual Ratings')
plt.ylabel('Predicted Ratings')
plt.title('Multiple Linear Regression: Actual vs Predicted Ratings')
plt.legend()
plt.show()

```



The multiple linear regression model slightly improves on the simple linear regression model in terms of both MSE and  $R^2$ . However, the  $R^2$  is still very low, indicating that even with additional features (cuisine, location, and delivery\_time), the model is not capturing much of the variance in the ratings. This suggests that other factors not included in the model might be influencing the ratings.

### 3. Logistic Regression:

```
[444]: from sklearn.linear_model import LogisticRegression

# Convert target to binary classification
y_binary = (df_cleaned['rating'] >= 4).astype(int)

# Split the data
X_train_bin, X_test_bin, y_train_bin, y_test_bin = train_test_split(X,
    ↪ y_binary, test_size=0.3, random_state=42)

# Initialize and train the model
logistic_model = LogisticRegression(max_iter=1000)
logistic_model.fit(X_train_bin, y_train_bin)
```

```

# Make predictions
y_pred_logistic = logistic_model.predict(X_test_bin)

# Evaluate the model
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score

accuracy_logistic = accuracy_score(y_test_bin, y_pred_logistic)
precision_logistic = precision_score(y_test_bin, y_pred_logistic)
recall_logistic = recall_score(y_test_bin, y_pred_logistic)
f1_logistic = f1_score(y_test_bin, y_pred_logistic)

print(f'Logistic Regression Accuracy: {accuracy_logistic:.4f}')
print(f'Logistic Regression Precision: {precision_logistic:.4f}')
print(f'Logistic Regression Recall: {recall_logistic:.4f}')
print(f'Logistic Regression F1 Score: {f1_logistic:.4f}')

```

```

Logistic Regression Accuracy: 0.7911
Logistic Regression Precision: 0.7911
Logistic Regression Recall: 1.0000
Logistic Regression F1 Score: 0.8834

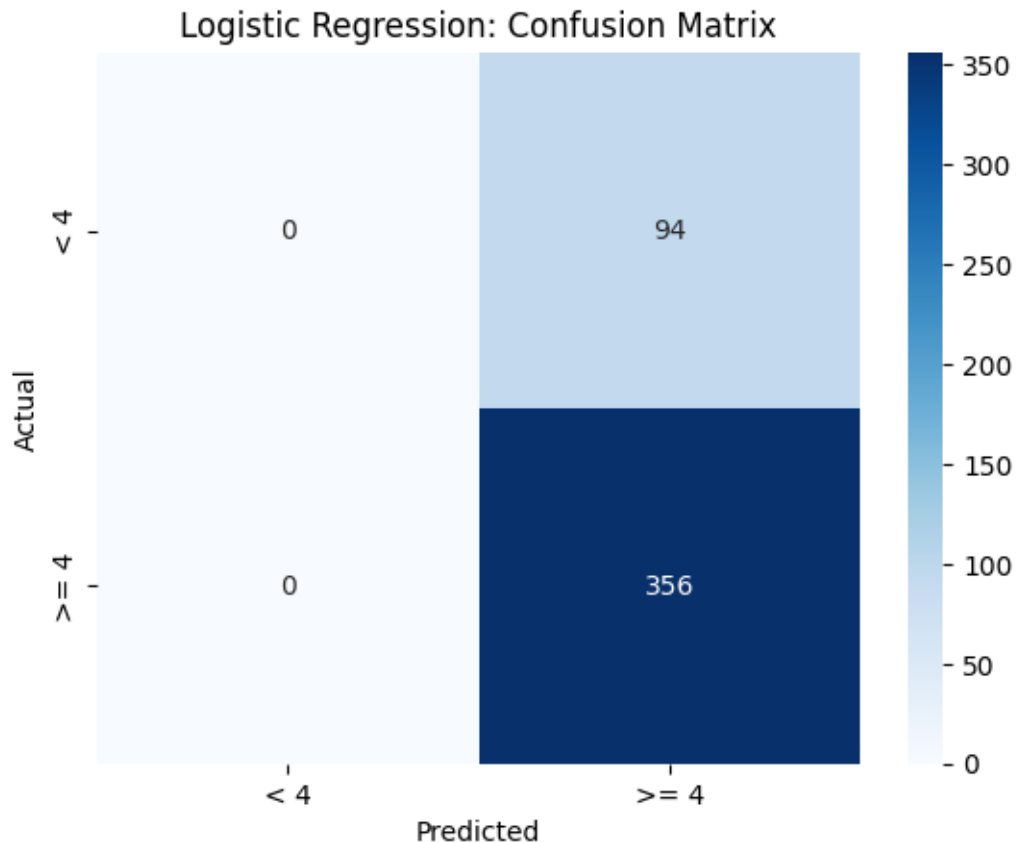
```

```

[445]: from sklearn.metrics import confusion_matrix
import numpy as np

# Confusion Matrix for Logistic Regression
cm = confusion_matrix(y_test_bin, y_pred_logistic)
sns.heatmap(cm, annot=True, fmt="d", cmap="Blues", xticklabels=['< 4', '>= 4'],
            yticklabels=['< 4', '>= 4'])
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.title('Logistic Regression: Confusion Matrix')
plt.show()

```



Logistic regression performs well in classifying whether a rating is greater than or equal to 4. The high recall (1.0000) indicates that the model correctly identifies all high ratings, but the precision (0.7911) suggests that there are some false positives. The F1 score of 0.8834 indicates a good balance between precision and recall.

#### 4. Decision Tree Regressor:

```
[446]: from sklearn.tree import DecisionTreeRegressor

# Initialize and train the model
dt_model = DecisionTreeRegressor(random_state=42)
dt_model.fit(X_train, y_train)

# Make predictions
y_pred_dt = dt_model.predict(X_test)

# Evaluate the model
mse_dt = mean_squared_error(y_test, y_pred_dt)
r2_dt = r2_score(y_test, y_pred_dt)

print(f'Decision Tree Regression MSE: {mse_dt:.4f}')
```

```
print(f'Decision Tree Regression R2: {r2_dt:.4f}')
```

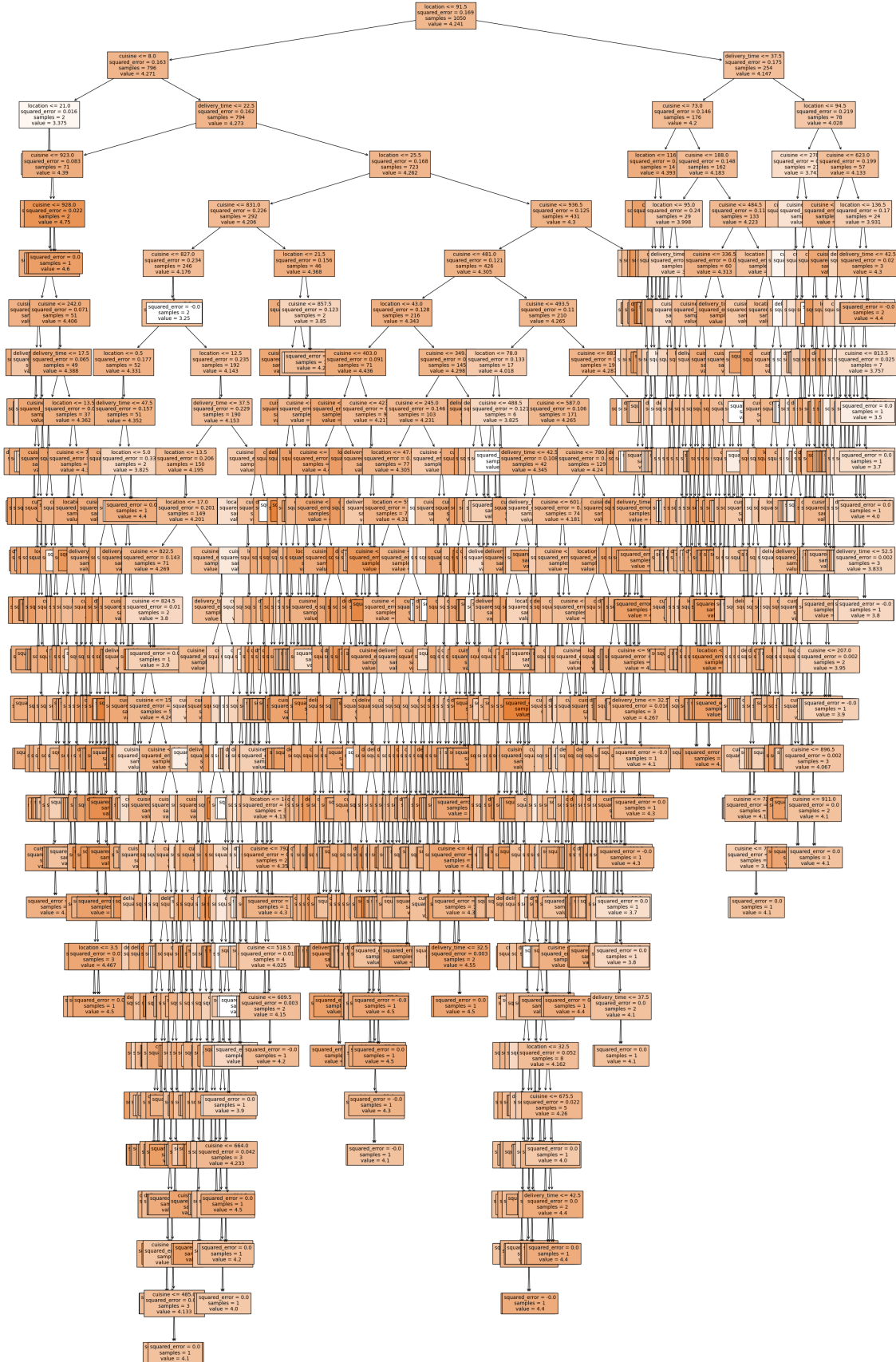
Decision Tree Regression MSE: 0.3071

Decision Tree Regression R2: -1.0204

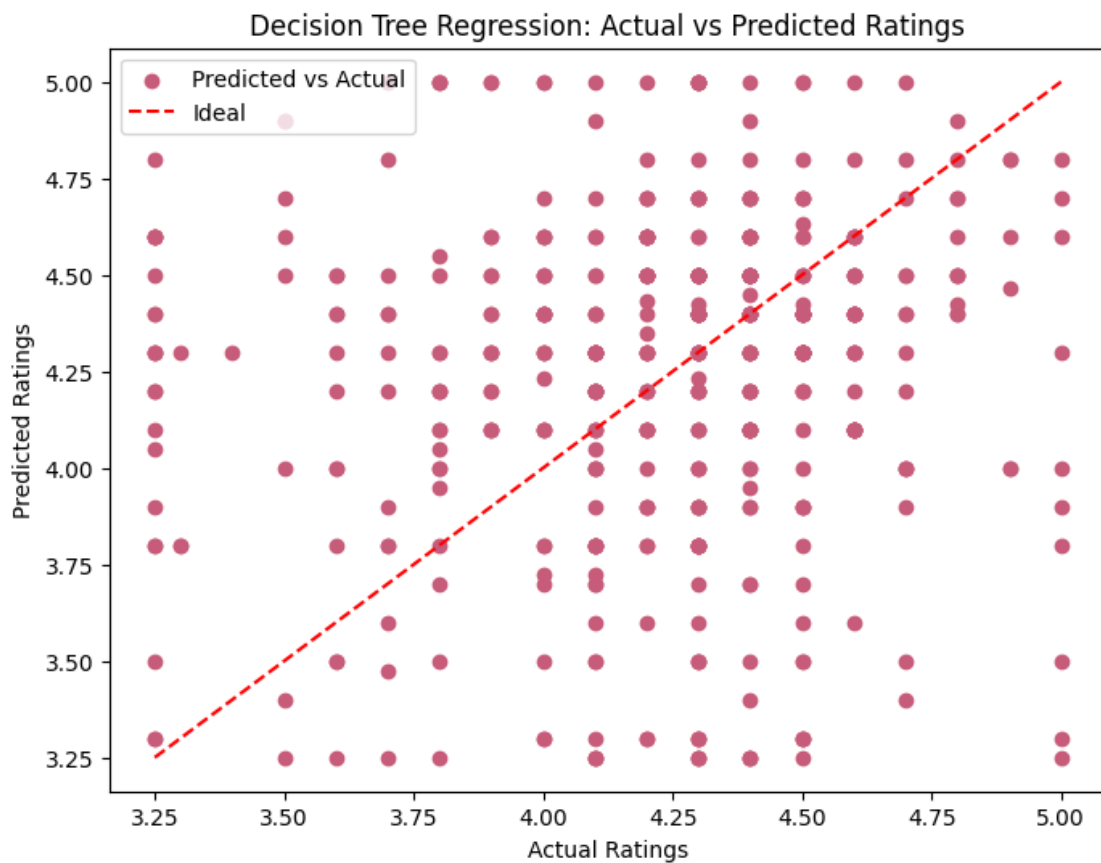
```
[447]: from sklearn.tree import plot_tree

# Plot the decision tree
plt.figure(figsize=(30, 50))
plot_tree(dt_model, filled=True, feature_names=X_train.columns, fontsize=10)
plt.title('Decision Tree Visualization')
plt.show()
```

Decision Tree Visualization



```
[448]: # Plot for Decision Tree Regression
plt.figure(figsize=(8, 6))
plt.scatter(y_test, y_pred_dt, color='#C75B7A', label='Predicted vs Actual')
plt.plot([min(y_test), max(y_test)], [min(y_test), max(y_test)], color='red',
         linestyle='--', label='Ideal')
plt.xlabel('Actual Ratings')
plt.ylabel('Predicted Ratings')
plt.title('Decision Tree Regression: Actual vs Predicted Ratings')
plt.legend()
plt.show()
```



The decision tree model performs poorly, with a high MSE and a negative  $R^2$  value. A negative  $R^2$  suggests that the model is performing worse than a simple mean-based model (i.e., predicting the mean of the ratings for all predictions). This could indicate overfitting to the training data or that the decision tree is not a good fit for this dataset.

## 5. Random Forest Regression:

```
[449]: from sklearn.ensemble import RandomForestRegressor

# Initialize and train the model
rf_model = RandomForestRegressor(random_state=42, n_estimators=100)
rf_model.fit(X_train, y_train)

# Make predictions
y_pred_rf = rf_model.predict(X_test)

# Evaluate the model
mse_rf = mean_squared_error(y_test, y_pred_rf)
r2_rf = r2_score(y_test, y_pred_rf)

print(f'Random Forest Regression MSE: {mse_rf:.4f}')
print(f'Random Forest Regression R2: {r2_rf:.4f}')
```

Random Forest Regression MSE: 0.1660

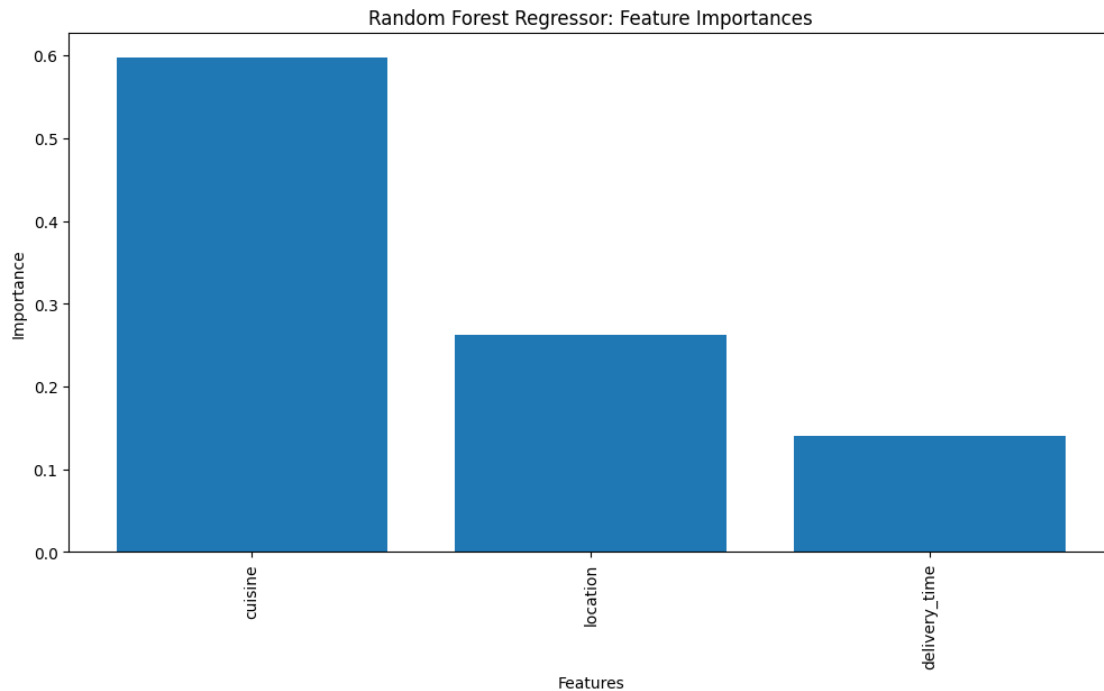
Random Forest Regression R2: -0.0923

```
[450]: import numpy as np

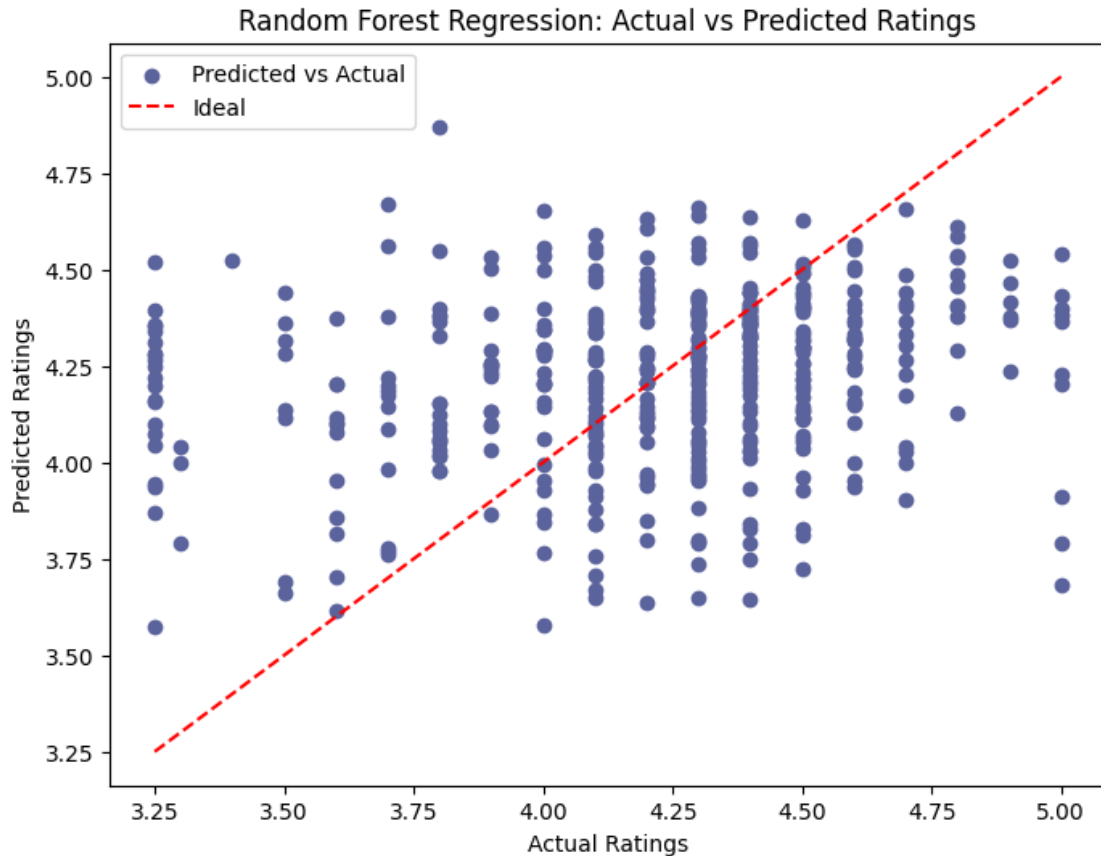
# Get feature importances
importances = rf_model.feature_importances_
indices = np.argsort(importances)[::-1]

# Plot feature importances
plt.figure(figsize=(12, 6))
plt.bar(range(X_train.shape[1]), importances[indices], align='center')
plt.xticks(range(X_train.shape[1]), X_train.columns[indices], rotation=90)
plt.xlabel('Features')
plt.ylabel('Importance')
plt.title('Random Forest Regressor: Feature Importances')
plt.show()
```





```
[451]: # Plot for Random Forest Regression
plt.figure(figsize=(8, 6))
plt.scatter(y_test, y_pred_rf, color='#5A639C', label='Predicted vs Actual')
plt.plot([min(y_test), max(y_test)], [min(y_test), max(y_test)], color='red',
         linestyle='--', label='Ideal')
plt.xlabel('Actual Ratings')
plt.ylabel('Predicted Ratings')
plt.title('Random Forest Regression: Actual vs Predicted Ratings')
plt.legend()
plt.show()
```



The random forest model also performs poorly, with a negative  $R^2$  value, though it is less negative than the decision tree. The higher MSE compared to the linear models suggests that the ensemble approach of random forests did not generalize well for this particular dataset.

```
[452]: # Display all results
print("\nModel Performance Summary:")
print(f"Simple Linear Regression: MSE = {mse_simple_lr:.4f}, R2 = {r2_simple_lr:.4f}")
print(f"Multiple Linear Regression: MSE = {mse_multiple_lr:.4f}, R2 = {r2_multiple_lr:.4f}")
print(f"Logistic Regression: Accuracy = {accuracy_logistic:.4f}, Precision = {precision_logistic:.4f}, Recall = {recall_logistic:.4f}, F1 = {f1_logistic:.4f}")
print(f"Decision Tree Regression: MSE = {mse_dt:.4f}, R2 = {r2_dt:.4f}")
print(f"Random Forest Regression: MSE = {mse_rf:.4f}, R2 = {r2_rf:.4f}")
```

Model Performance Summary:

Simple Linear Regression: MSE = 0.1495, R2 = 0.0162

Multiple Linear Regression: MSE = 0.1493, R2 = 0.0174

Logistic Regression: Accuracy = 0.7911, Precision = 0.7911, Recall = 1.0000, F1 = 0.8834

Decision Tree Regression: MSE = 0.3071, R2 = -1.0204

Random Forest Regression: MSE = 0.1660, R2 = -0.0923

### #Key Insights:

- **Linear Models (*Simple and Multiple*):** The linear models, while having low MSE, struggle to capture the variance in ratings (as indicated by low  $R^2$  values). This suggests that the relationship between the selected features and the target (rating) is not well explained by linear models, indicating that the problem might be more complex or that important predictive features are missing.
- **Logistic Regression:** This model performs relatively well in classifying high ratings, suggesting that it can be effective for binary classification problems. However, its performance might drop if more classes or a more nuanced rating scale were used.
- **Tree-Based Models (*Decision Tree and Random Forest*):** Both models perform poorly, especially the decision tree model, which is likely overfitting or not capturing the underlying pattern of the data well. The random forest, while typically robust, also struggles with this dataset, suggesting that the selected features are not providing enough useful information for these models.

### #Conclusion:

- The low performance across models, especially the  $R^2$  values for regression models, suggests that the selected features (cuisine, location, and delivery\_time) are not sufficient predictors of restaurant ratings. There may be other influential factors not captured in the dataset, such as service quality, price, or customer satisfaction, that could better explain the variation in ratings.
- For classification tasks, logistic regression shows promise in predicting whether a rating is above a certain threshold, but further exploration with more sophisticated models or feature engineering may be necessary to improve prediction accuracy.
- Recommendation: Gathering additional data or applying advanced techniques like feature engineering or using more complex models (e.g., neural networks) can improve predictive performance. Further exploration into other features or data sources that capture customer experience or restaurant characteristics might provide better results.