



Marketing Campaign for a Restaurant Chain

Using Exploratory Data Analysis

Objective:

To utilize exploratory data analysis (EDA) skills to understand customer preferences, dining trends, and competitive landscape in various regions of India, and to design an effective marketing campaign for a restaurant chain.

Dataset:

"zomato_restaurants_in_India.csv"

The dataset from Zomato contains detailed information about various restaurants in India. Here are the columns in the dataset:

1. **res_id** (int64): A unique identifier for each restaurant.
2. **name** (object): The name of the restaurant.
3. **establishment** (object): The type of establishment (e.g., Quick Bites, Casual Dining).
4. **url** (object): The URL of the restaurant's Zomato page.
5. **address** (object): The address of the restaurant.
6. **city** (object): The city where the restaurant is located.
7. **city_id** (int64): A unique identifier for the city.
8. **locality** (object): The locality within the city where the restaurant is situated.
9. **latitude** (float64): The latitude coordinate of the restaurant.
10. **longitude** (float64): The longitude coordinate of the restaurant.
11. **zipcode** (object): The postal code for the restaurant's location.
12. **country_id** (int64): A unique identifier for the country.
13. **locality_verbose** (object): A more detailed description of the locality.
14. **cuisines** (object): The types of cuisines offered by the restaurant.
15. **timings** (object): The operational hours of the restaurant.
16. **average_cost_for_two** (int64): The average cost for a meal for two people.
17. **price_range** (int64): The price range category.

18. **currency** (object): The type of currency used for pricing.
19. **highlights** (object): Key features or services offered by the restaurant.
20. **aggregate_rating** (float64): The aggregate rating of the restaurant on Zomato.
21. **rating_text** (object): A text description of the rating (e.g., Excellent, Very Good).
22. **votes** (int64): The number of votes received for the rating.
23. **photo_count** (int64): The number of photos uploaded for the restaurant.
24. **opentable_support** (float64): Indicator of OpenTable support.
25. **delivery** (int64): Indicator of delivery service availability.
26. **takeaway** (int64): Indicator of takeaway service availability.

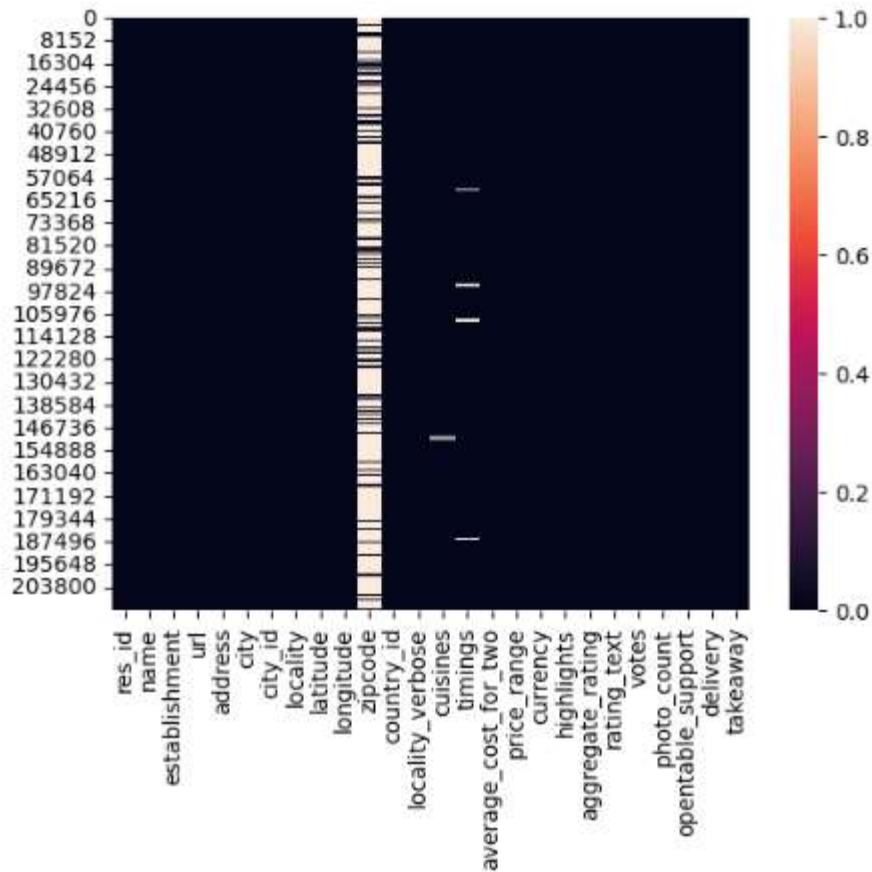
Data Cleaning and Preparation:

Duplicate Values

The dataset contains 151527 duplicate rows initially. After removing duplicates, it consists of 60417 rows and 26 columns.

Missing Values

1. **address**: 18 missing values.
2. **zipcode**: 47,869 missing values, a significant number.
3. **cuisines**: 470 missing values.
4. **timings**: 1,070 missing values.
5. **Opentable_support**: 19 missing values.



Handling Missing Values

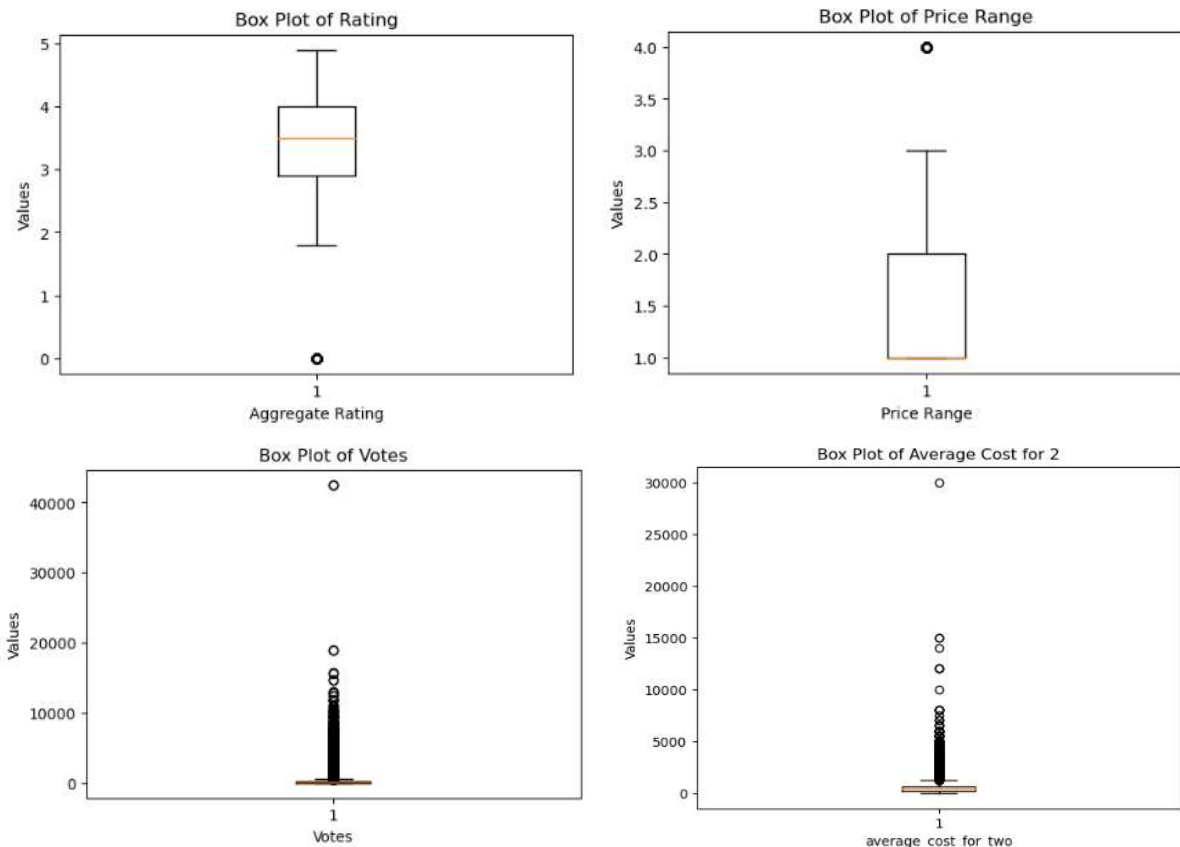
1. **Removed the 'zipcode' column:** This column was dropped from the dataset due to its high percentage of missing values.
2. **Filled missing values in 'address' and 'timings' columns:**
 - ✓ Missing values in the **'address'** column are replaced with "not known".
 - ✓ Missing values in the **'timings'** column are also filled with "not known".
3. **Imputed Values in 'cuisines' and 'opentable_support' column:**
 - ✓ Replaced missing values in the **cuisine** column with the most common cuisine.
 - ✓ Replaced missing values in the **opentable_support** column with the most common value.

This cleaned dataset is now more suitable for further analysis and modelling.

Inconsistencies:

- ✓ **votes** column has been addressed by converting negative values to positive.

Outliers Detection



We can observe the following outliers:

1. **aggregate_rating:** There are some outliers, particularly at the lower end of the rating scale.
2. **price_range:** Similar to votes, there are many outliers with a highest price range.
3. **votes:** This column shows a significant number of outliers, with some establishments having an exceptionally high number of votes.
4. **average_cost_for_two:** There are several outliers present, indicated by points far above the upper quartile.

Exploratory Data Analysis:

Descriptive Statistics:

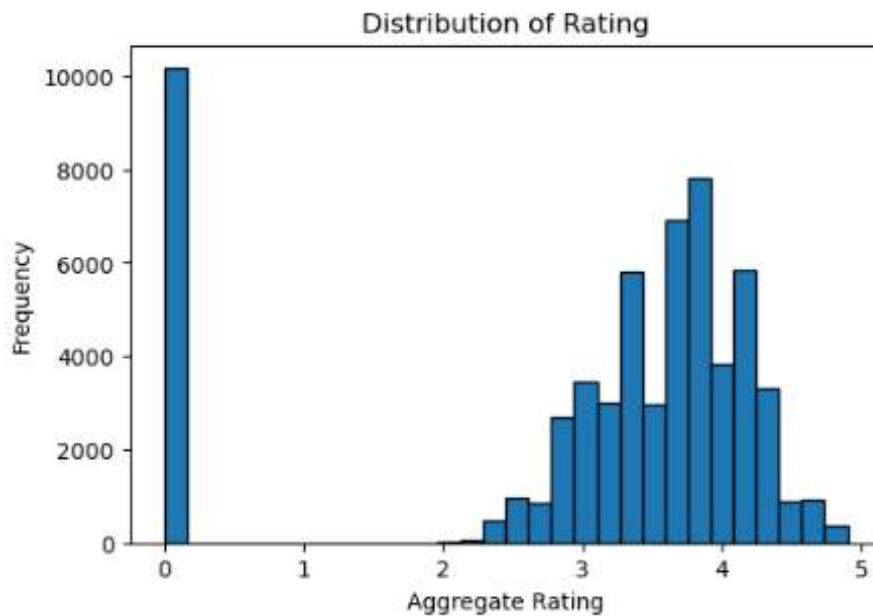
Here are the descriptive statistics for the selected numerical columns:

	average_cost_for_two	price_range	aggregate_rating	votes	photo_count
count	60417.000000	60417.000000	60417.000000	60417.000000	60417.000000
mean	538.304517	1.730821	3.032868	261.575583	194.247414
std	593.852227	0.880462	1.440751	728.283944	705.682451
min	0.000000	1.000000	0.000000	0.000000	0.000000
25%	200.000000	1.000000	2.900000	7.000000	1.000000
50%	400.000000	1.000000	3.500000	42.000000	11.000000
75%	600.000000	2.000000	4.000000	207.000000	82.000000
max	30000.000000	4.000000	4.900000	42539.000000	17702.000000

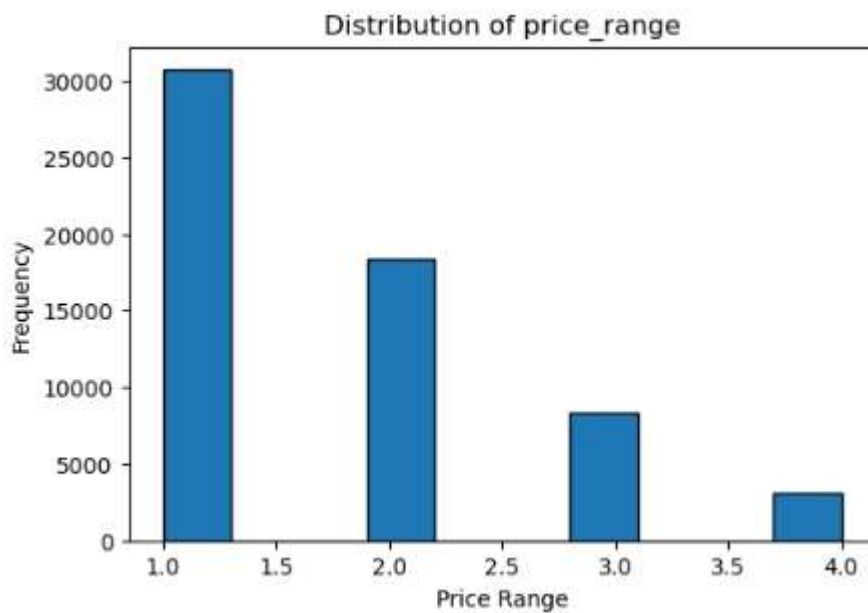
	average_cost_for_two	price_range	aggregate_rating	votes	photo_count
median	400.000000	1.000000	3.500000	42.000000	11.000000
variance	352660.466987	0.775214	2.075765	530397.503097	497987.722353
skewness	6.055283	0.996345	-1.380707	12.764811	9.094060
kurtosis	139.079530	0.070243	0.461597	449.344422	122.807763

This table provides a clear overview of the central tendency (mean, median), dispersion (standard deviation, percentiles), and shape (skewness, kurtosis) of the dataset's distribution for these features.

Distribution Analysis:

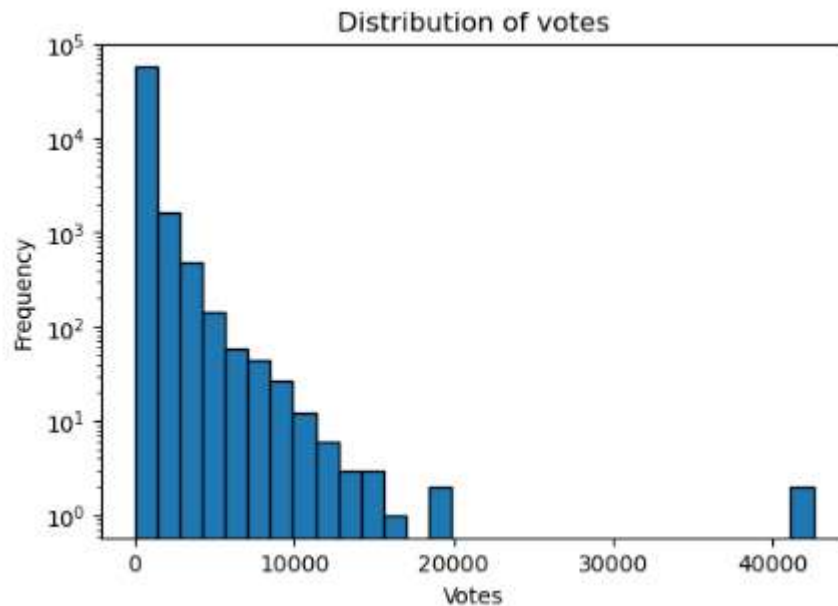


The rating distribution shows a multimodal pattern, with significant peaks around 3.0 and 4.0. A noticeable concentration of ratings in the range of 3.0 to 4.0 indicates that most restaurants have ratings within this range. The distribution also shows a left skew, with fewer restaurants having no/low ratings (close to 0).

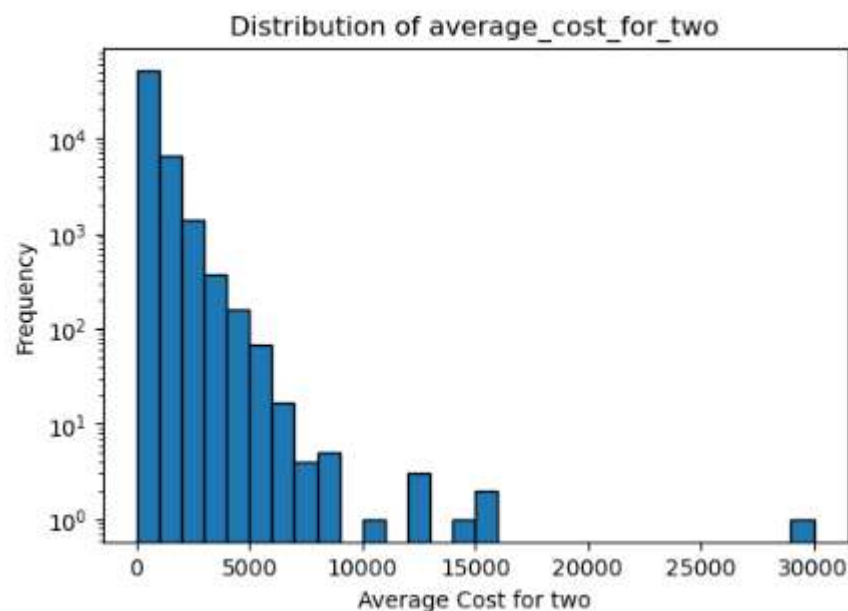


The price range distribution is skewed towards the lower end, with most restaurants falling in lower prices (1 and 2).

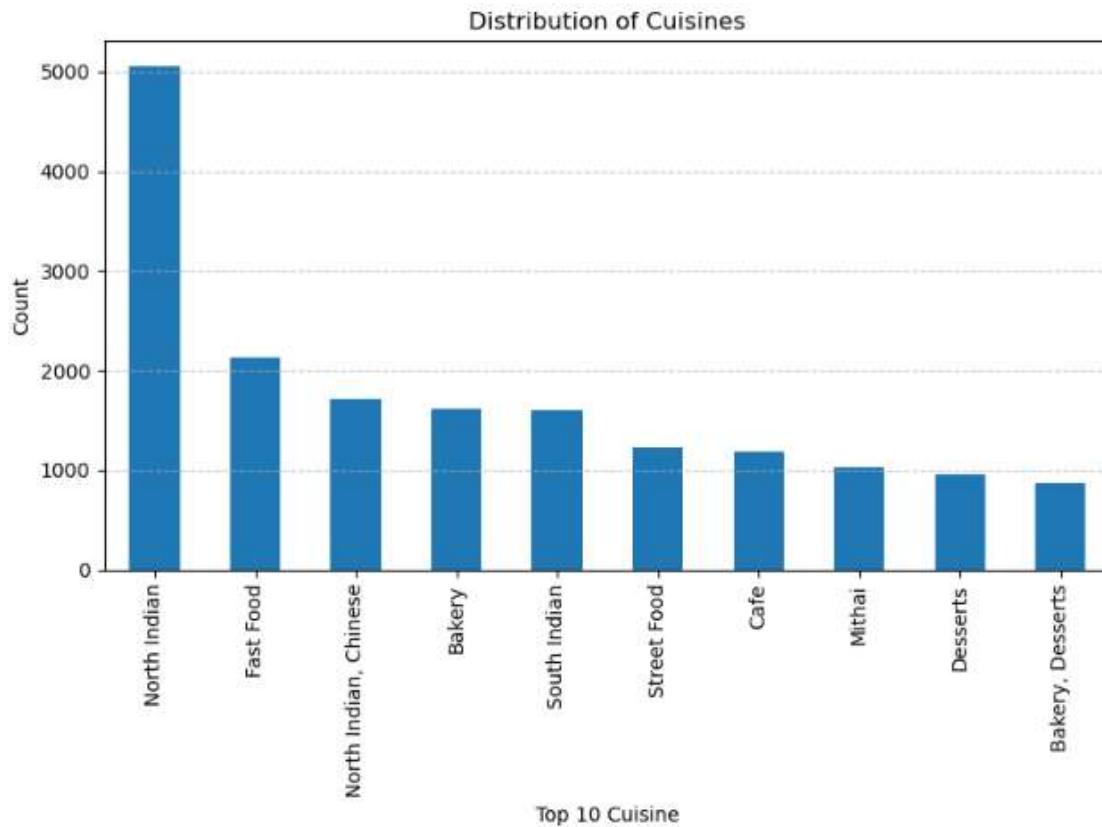
There is a noticeable decline in frequency as the price range increases, indicating that higher-priced restaurants are less common in the dataset.



The vote distribution is highly right-skewed, indicating that most restaurants have a low number of votes. To reduce this skewness logarithmic transformation should be done.



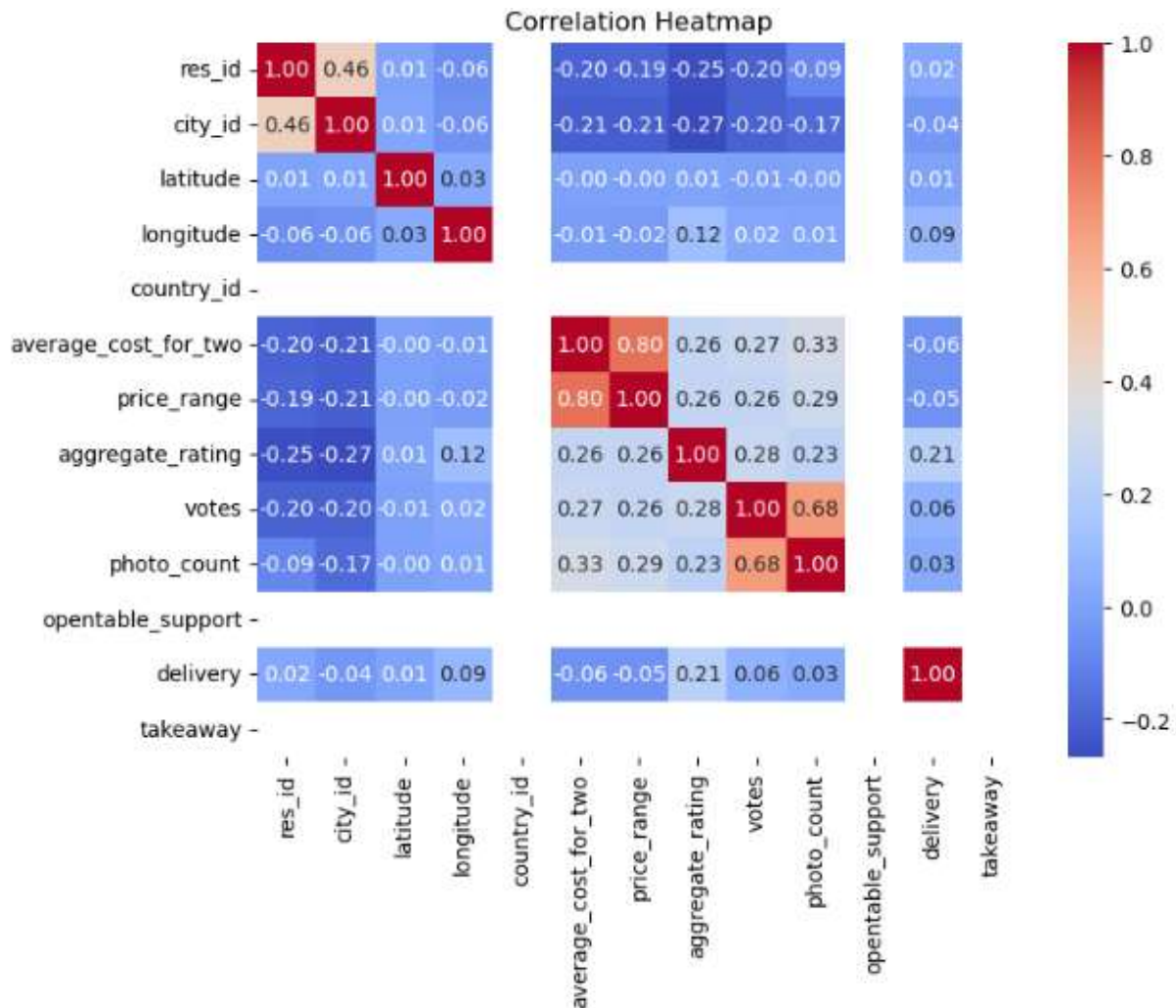
The distribution of `average_cost_for_two` shows a highly right-skewed distribution with most values clustered at the lower end. To reduce this skewness logarithmic transformation should be done.



The analysis of cuisines reveals various popular cuisines in the dataset. Specific cuisines are more prevalent than others, with some like North Indian, Chinese, and Fast Food being particularly common.

Correlation Analysis:

The correlation analysis of selected variables in the Zomato dataset reveals the following relationships:



Average Cost for Two and Price Range:

A strong positive correlation (0.80) exists between the average cost for two and the price range. This suggests that the average cost for two people at a restaurant increases as the price range increases.

Votes and Photo Count:

A strong positive correlation (0.68) is observed between the number of votes and the photo count. This suggests that restaurants with more votes also tend to have a higher number of photos, indicating higher customer engagement.

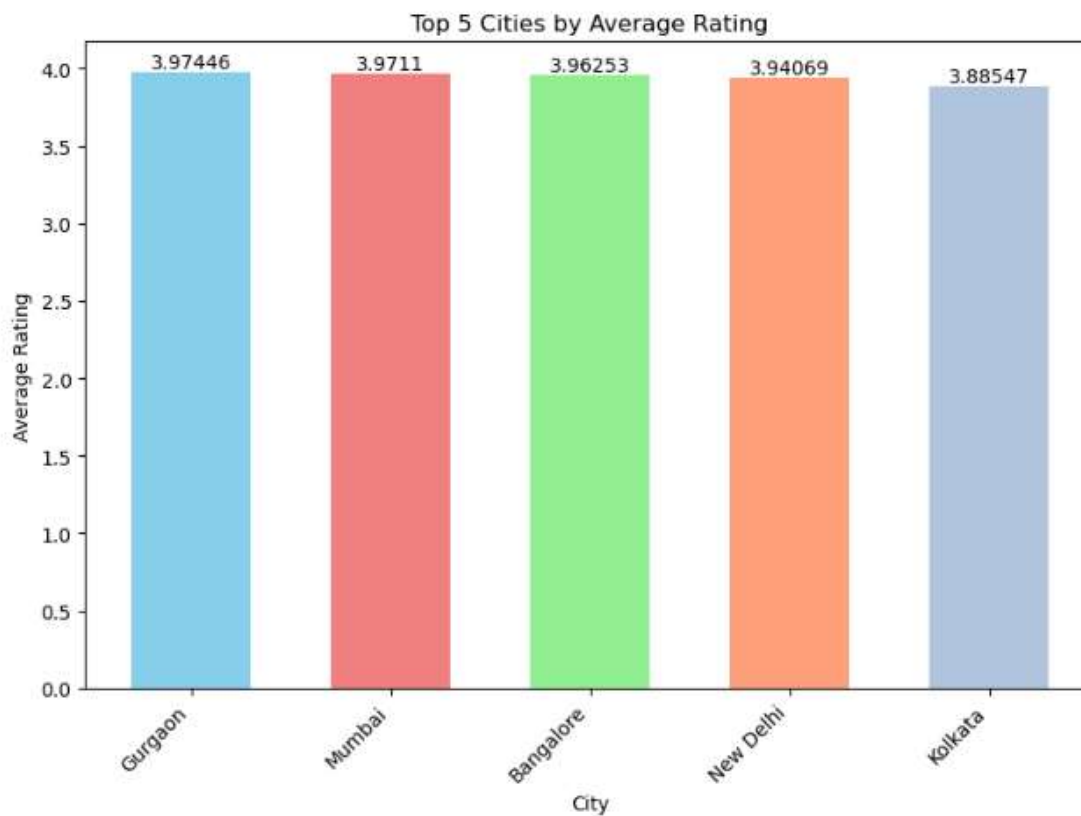
Other Correlations:

There is a moderate or negligible correlation between all others.

Regional Analysis:

Top 5 Cities by Average Rating:

The bar graph illustrates the average ratings of restaurants in the top cities. Gurgaon leads with the highest average rating, followed closely by Mumbai, Bangalore, New Delhi and Kolkata.

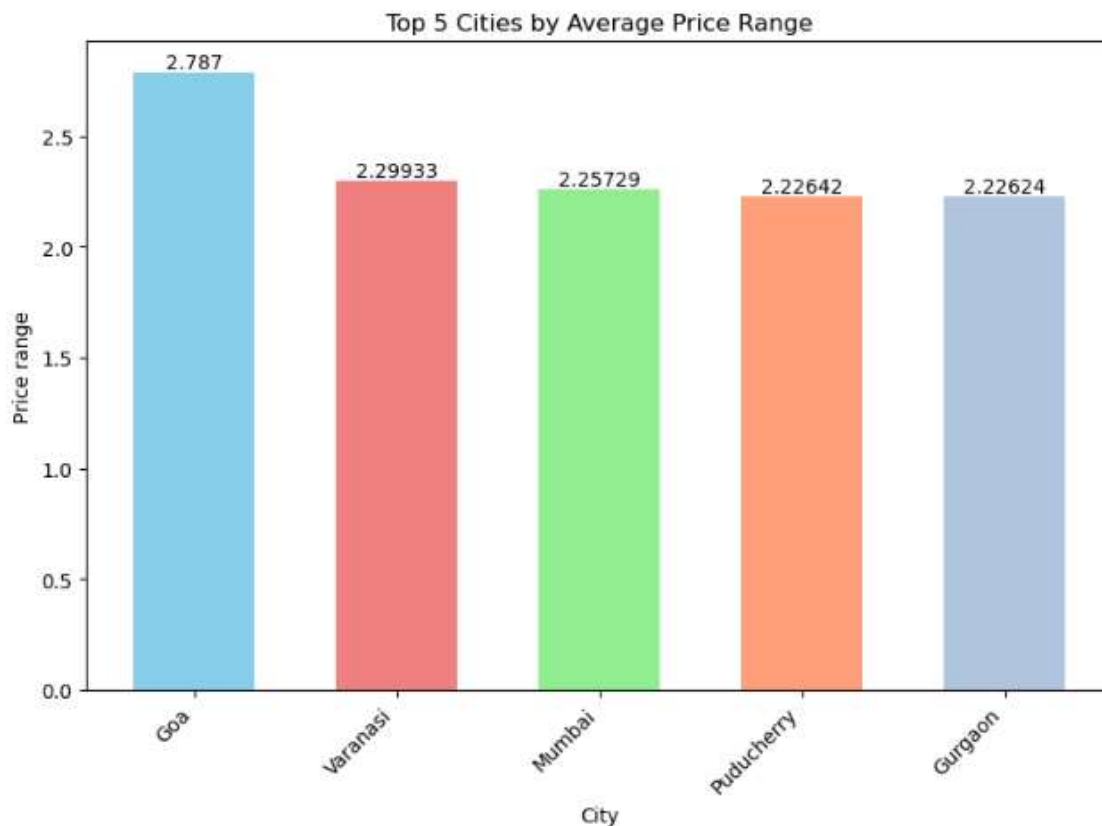


Top 5 Cities by Price Range:

The bar graph illustrates the Price Range of restaurants in the top cities.

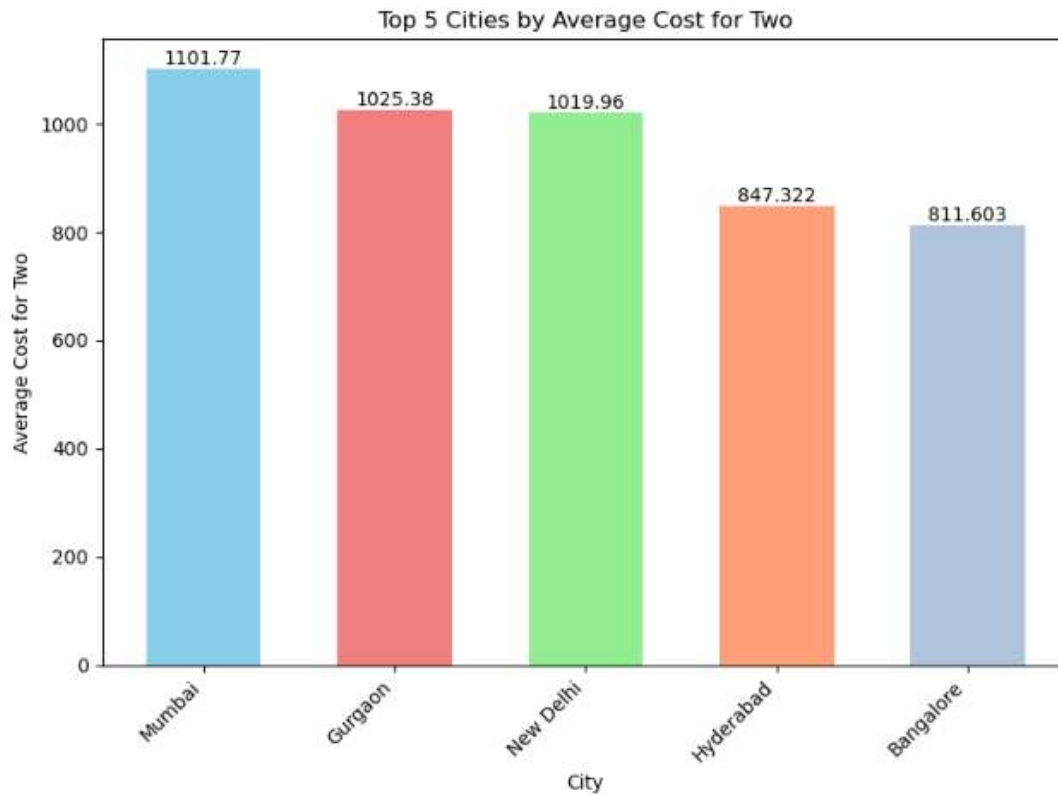
Goa has the highest Price Range, followed by Varanasi, Mumbai, Puducherry and Gurgaon.

Goa is an exception, with a higher common price range, reflecting possibly more tourist-oriented or upscale dining options.



Top 5 Cities by Average Cost for Two:

The bar graph illustrates the average ratings of restaurants in the top cities. Mumbai leads with the highest average rating, followed closely by Gurgaon, New Delhi, Hyderabad and Bangalore.



Top 5 Cities by Establishment:

According to the table below, Casual Dining is the most famous across establishment across multiple cities. It is most famous in Chennai, followed by Mumbai, Bangalore, Goa and Pune.

city	establishment	count
Chennai	['Casual Dining']	740
Mumbai	['Casual Dining']	640
Bangalore	['Casual Dining']	541
Goa	['Casual Dining']	499
Pune	['Casual Dining']	459

Top 5 Cities by Cuisine:

According to the table below, North Indian cuisine is famous across multiple cities, while other cuisines vary more regionally. It is most famous in Jaipur. The second famous cuisine is South Indian which is most famous in Madurai.

city	cuisines	count
Jaipur	North Indian	204
Jalandhar	North Indian	162
Madurai	South Indian	142
Gwalior	North Indian	140
Kota	North Indian	136

Top 5 Highlights of Top 5 Restaurants

According to the table below, the popular dining scene in Top 5 restaurants are ‘Indoor Seating’ with ‘Air Conditioner’, serves both ‘Lunch’ and ‘Dinner’, having food that is ‘Pure veg’ including ‘Desserts and bakes’, they have the facility of ‘Takeaway’ and ‘Delivery’ and payment methods available are ‘Cash’, ‘Credit Card’ or ‘Debit Card’.

highlights	count
['Cash', 'Takeaway Available', 'Credit Card', 'Delivery', 'Debit Card', 'Indoor Seating', 'Desserts and Bakes', 'Air Conditioned', 'Pure Veg']	48
['Dinner', 'Cash', 'Takeaway Available', 'Debit Card', 'Lunch', 'Delivery', 'Credit Card', 'Indoor Seating', 'Air Conditioned']	42
['Dinner', 'Delivery', 'Lunch', 'Cash', 'Takeaway Available', 'Indoor Seating']	41
['Dinner', 'Takeaway Available', 'Lunch', 'Cash', 'Indoor Seating']	37
['Dinner', 'Delivery', 'Lunch', 'Cash', 'Takeaway Available', 'Outdoor Seating']	35

Customer Preference Analysis:

Popular Cuisines in Top 5 Cities:

The top 5 cuisines in top 5 cities were analyzed to find out the customer preferences. The analysis indicated the customer preferences for different cuisines.

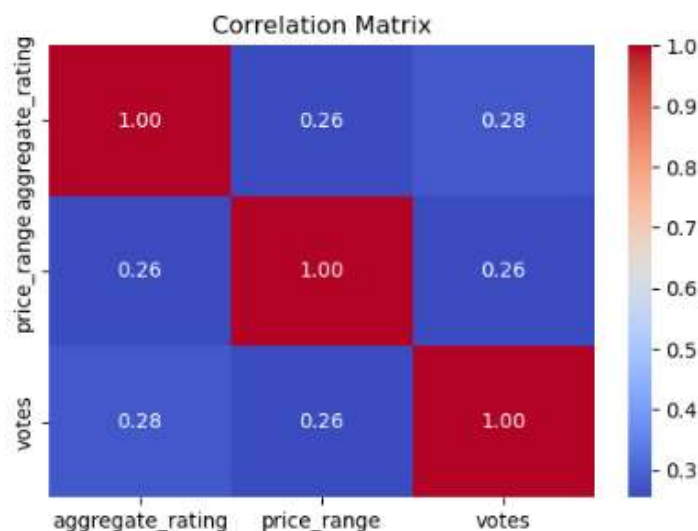
The chart below displays the number of restaurants offering the most popular cuisine in each city. It underscores the prevalence of specific cuisines like North Indian, South Indian, Street Food and Bakery, Deserts in these regions.

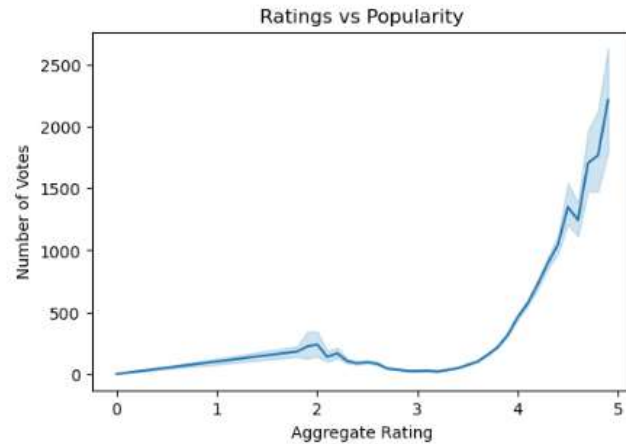
	city	cuisines	Count
0	Bangalore	South Indian	103
1	Bangalore	Mithai, Street Food	102
2	Bangalore	North Indian	64
3	Bangalore	Beverages, Desserts, Ice Cream	48
4	Bangalore	Bakery, Desserts	44
5	Chennai	South Indian	132
6	Chennai	Ice Cream, Desserts	93
7	Chennai	Finger Food	56
8	Chennai	North Indian	48
9	Chennai	Burger, Fast Food	40
10	Mumbai	Bakery, Desserts	71
11	Mumbai	North Indian	51
12	Mumbai	Fast Food	49
13	Mumbai	Beverages, Desserts, Ice Cream	44
14	Mumbai	Ice Cream, Desserts	38
15	New Delhi	North Indian	133
16	New Delhi	Street Food	46
17	New Delhi	Desserts, Ice Cream, Beverages	41
18	New Delhi	Paan	40
19	New Delhi	Burger, Fast Food, Beverages	34
20	Pune	North Indian	70
21	Pune	Street Food	57
22	Pune	Mithai, Street Food	50
23	Pune	North Indian, Chinese	48
24	Pune	Bakery, Desserts	45

Relationship between restaurant ratings, price range, and popularity.

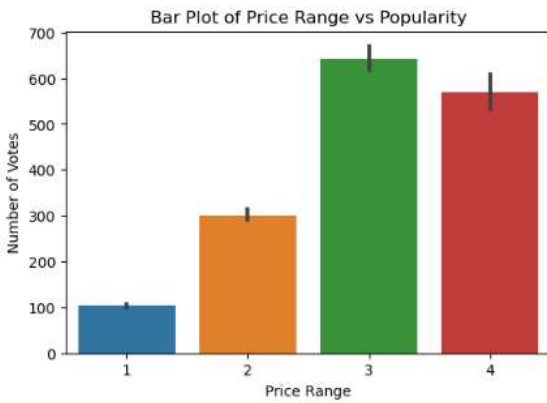
The correlation between the aggregate rating and votes is relatively low (0.28) or between the aggregate rating and price range is also low (0.26), suggesting a weaker relationship.

Similarly, the correlation between price range and votes is (0.26) are also relatively low.





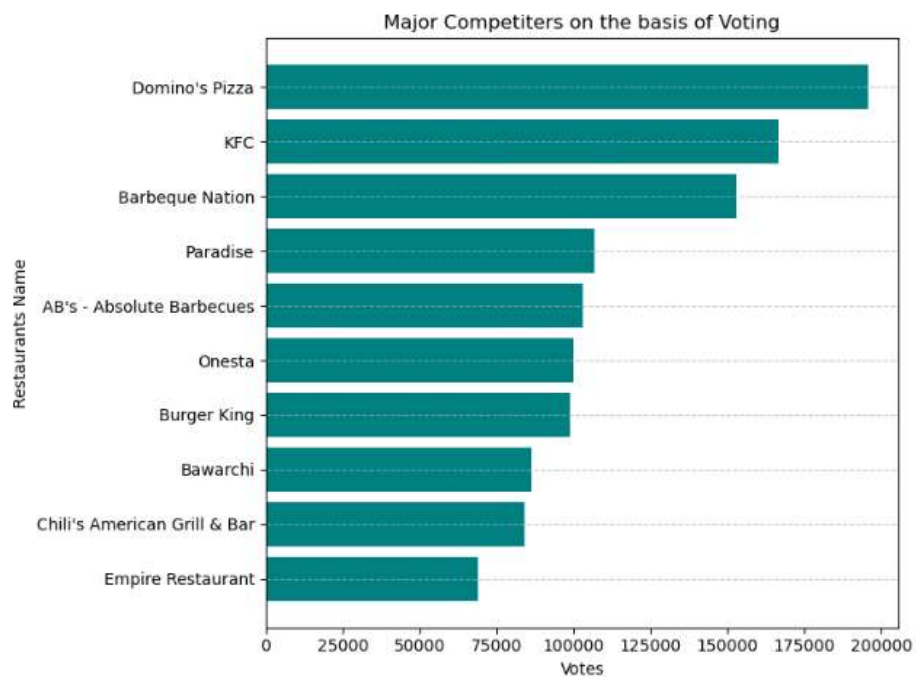
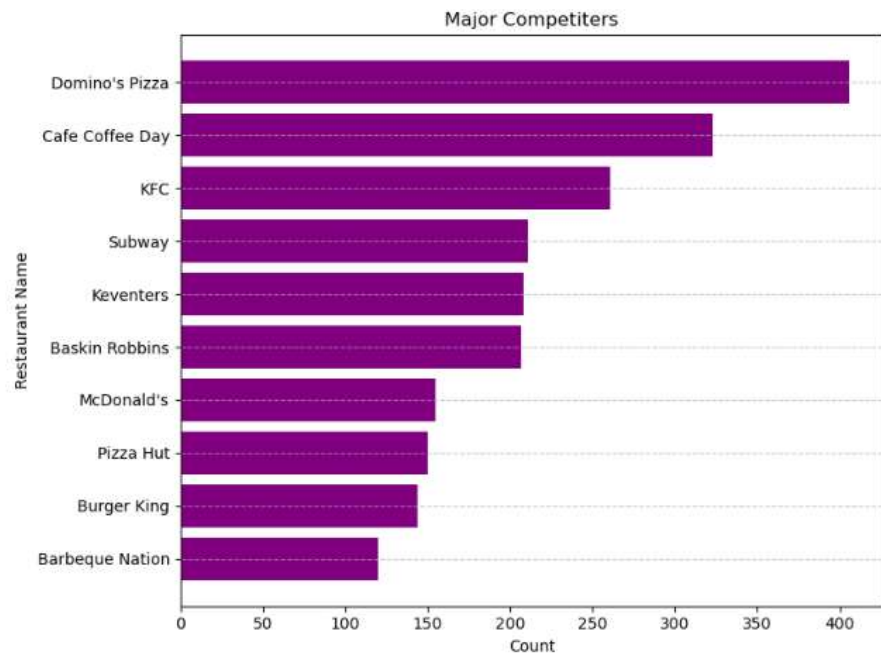
According to this chart, number of votes are increasing with aggregate rating but there is a slight decrease in votes between range 2 to 3 of rating.



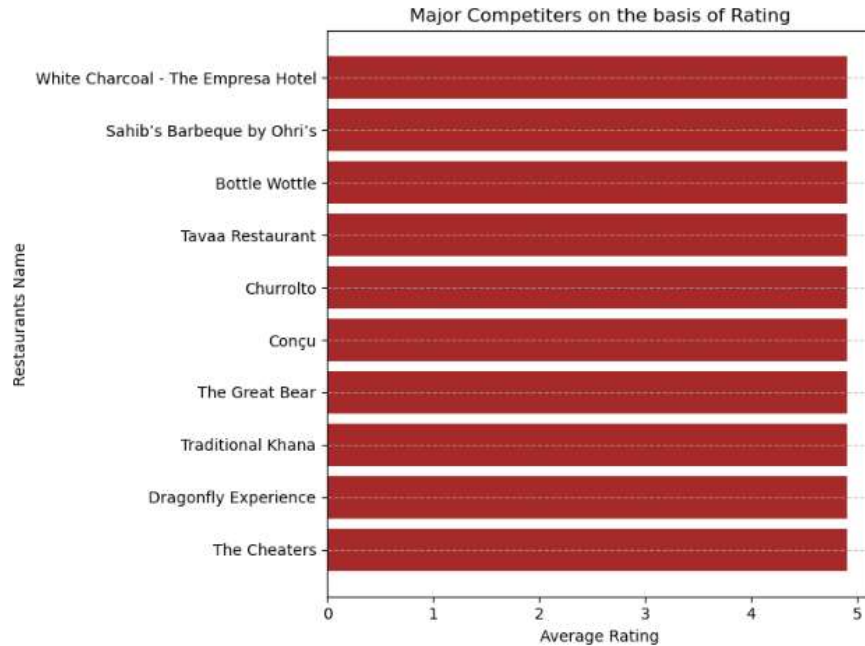
There is a visible correlation in the average ratings across different price categories. And, the number of votes are highest for the price range '3'. For restaurants considering their pricing strategies, this chart explains how pricing might relate to perceived quality and customer satisfaction.

Competitive Analysis:

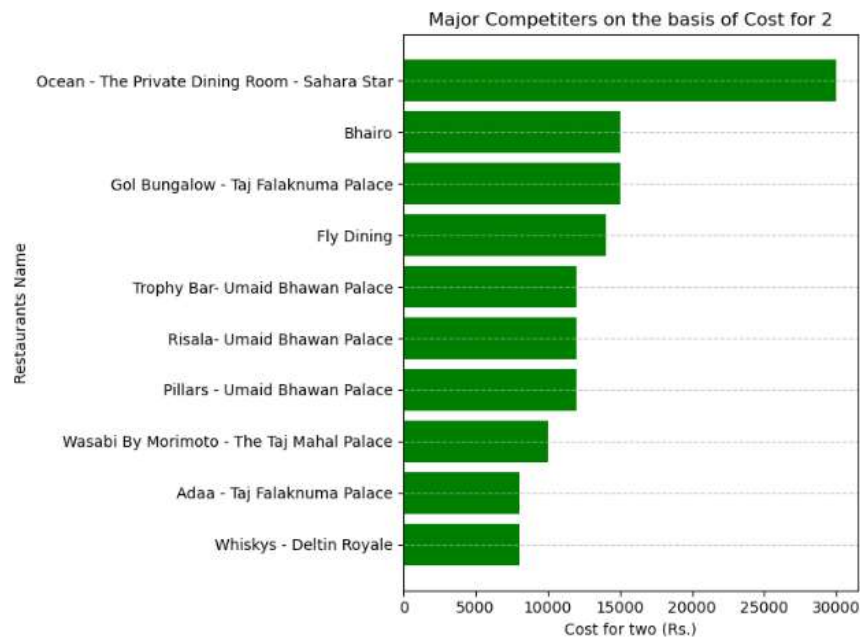
Major Competitors based on cuisine, pricing, and ratings:



According to these charts, 'Domino's Pizza', 'KFC', 'Barbeque Nation' and 'Burger King' are major competitors on the basis of popularity and voting.



This chart provides a clear and concise overview of the highest-rated restaurants in the data. But the results are different from the top 10 restaurants and top-voted restaurants.



This chart shows the cost-wise outliers as they offer distinctive experience for elite customers. This high cost puts them beyond financial reach of 90% customers.

Strengths:

1. **High Ratings:** All these restaurants have high aggregate ratings (around 4.9), indicating excellent customer satisfaction and a strong reputation for quality.
2. **Diverse Cuisines:** While specializing in Chinese cuisine, these restaurants also offer a range of other cuisines (like North Indian, European, BBQ, and Asian), catering to a broader audience with varied taste preferences.
3. **Premium Dining Experience:** The relatively high average cost for two suggests that these restaurants are likely offering a premium dining experience, which includes quality food, ambiance, and service.

Weaknesses:

1. **Pricing Exclusivity:** The high average cost might be prohibitive for budget conscious diners, limiting the customer base to those willing or able to spend more.
2. **Competition from Local Cuisine:** In cities, where local cuisines are predominant, Chinese cuisine might face stiff competition, requiring these restaurants to constantly maintain high standards to attract customers.
3. **Economic Sensitivity:** Being premium establishments, these restaurants might be more sensitive to economic downturns, as consumers tend to limit their spending on luxury dining experiences during such times.

Market Gap Analysis:

Here are some potential gaps that Zomato India could consider:

1. **Regional Cuisine Diversity:** India is known for its rich culinary heritage, with each region offering unique cuisines and flavors. Zomato could capitalize on this by focusing on promoting and delivering regional cuisines that are not widely available outside their respective regions. For example, cuisines from Northeast India, such as Assamese, Manipuri, or Naga cuisine, may be underrepresented in many parts of the country.

2. Healthy and Dietary-specific Options: There is a growing demand for healthy and dietary-specific food options, including vegetarian, vegan, gluten-free, and organic dishes. Zomato could expand its offerings in this category by partnering with restaurants that specialize in these types of cuisines or by introducing dedicated sections or filters in its app for health-conscious consumers.

3. Affordable Dining Options: While Zomato offers a wide range of dining options across various price ranges, there may be opportunities to focus on providing affordable dining options for budget-conscious consumers. This could include partnering with budget-friendly restaurants or offering exclusive deals and discounts for value-conscious diners.

4. Specialized Dining Experiences: Zomato could offer specialized dining experiences, such as rooftop dining, fine dining experiences, themed restaurants, or experiential dining events. These unique offerings could attract discerning customers looking for memorable dining experiences beyond traditional restaurant meals.

5. Convenience and Quick Service: If there's a lack of quick-service options or convenient dining solutions in the market, the Zomato could fill this gap by offering fast-casual dining experiences with high-quality food and efficient service.

6. Open-Table Support: This feature will add on to the customer popularity as ease of reservations is something that modern day customers cherish a lot.

By identifying and capitalizing on these market gaps, Zomato can enhance its offerings, attract new customers, and strengthen its position as a leading food delivery and restaurant services platform in India.

Designing the Marketing Campaign:

Here's a proposed marketing campaign:

Campaign Theme: "Global Flavors, Local Charm: Experience the World on Your Plate"

Target Regions and Customer Segments:

1. **Urban Centers:** Target bustling urban areas with diverse populations where there is a high demand for international cuisines and unique dining experiences.
2. **Tourist Destinations:** Focus on regions with high tourist traffic, offering visitors a taste of global cuisine and cultural experiences.

Differentiation Strategies:

1. **Authenticity:** Emphasize the authenticity of the cuisines offered, highlighting the use of traditional recipes, imported ingredients, and expert chefs from different regions of the world.
2. **Customization:** Differentiate by offering customizable menu options to cater to various dietary preferences and flavor profiles, ensuring a personalized dining experience for each customer.
3. **Community Engagement:** Position the restaurant chain as an integral part of the community by participating in local events, sponsoring cultural festivals, and supporting charitable initiatives.

Promotional Tactics:

1. Grand Opening Events: Organize grand opening events at new locations, featuring live music, cultural performances, and complimentary tastings to generate buzz and attract customers.

2. Discounts and Special Offers: Offer introductory discounts for new customers and special promotions for loyal patrons, such as "Buy One Get One Free" deals, happy hour discounts, and seasonal menu specials.

3. Loyalty Programs: Implement a tiered loyalty program where customers earn points for each purchase, redeemable for discounts, free meals, or exclusive perks like chef's table experiences or cooking classes.

4. Limited-Time Menu Additions: Introduce limited-time menu additions featuring seasonal ingredients or themed cuisines, creating a sense of urgency and excitement among customers to try new dishes.

5. Online and Social Media Marketing: Utilize social media platforms and targeted online advertising to reach potential customers in different regions.

6. Collaborations and Partnerships: Collaborate with local influencers, food bloggers, and complementary businesses (such as travel agencies or cultural organizations) to cross-promote and expand reach within specific customer segments.

By implementing these strategies and promotional tactics, the Zomato can effectively target different regions and customer segments, differentiate from competitors, and create memorable dining experiences that keep customers coming back for more.