Project: Zomato Restaurants Analysis

Objective Questions:

1. What is the total no. of tables present in the data?

   Ans→ There are **2 tables** present in the given data, as mentioned:
   - **Raw data**
   - **Country description**

2. What is the total no. of attributes present in the data?

   Ans→ There are **22 attributes** present in the data across two tables, such as:

   - [*RestaurantID, RestaurantName, CountryCode, City, Address, Locality, Locality Verbose, Longitude, Latitude, Cuisines, Currency, Has_Table_booking, Has_Online_delivery, Is_delivering_now, Switch_to_order_menu, Price_range, Votes, Average_Cost_for_two, Rating, Datekey_Opening, Country code, Country name*]

3. How many categorical columns are there in the data? [Search about categorical and continuous data, and try to answer this question]

   Ans→ There are **17 categorical** columns across two tables in the data, This type of data represents distinct categories or groups. These categories have no inherent numerical value or order:

   - [*RestaurantID, RestaurantName, CountryCode, City, Address, Locality, LocalityVerbose, Cuisines, Currency, Has_Table_booking, Has_Online_delivery, Is_delivering_now, Switch_to_order_menu, Price_range, Datekey_Opening, Country code, Country name*]

     → There are **5 Continuous** data, as it refers to quantitative data that can take any value within a given range.

   - Longitude, Latitude, Votes, Average_Cost_for_two, Rating

4. The data consists of some inconsistent and missing values so ensure that the data used for further analysis is cleaned.

   Ans→ Data cleaning is a crucial step in the data analysis process, it helps to identify and correct errors or inconsistencies in the data to ensure accurate and reliable analysis.

   - Checking and removing duplicates present in the data using the 'Remove Duplicates' feature from the data tab in Excel.

   - There are **few blank cells** in the given data, The **'Cuisine'** column had **9 blank cells, deleting** the entire **9 rows from the data,** and **a trim operation** is performed for the **blank spaces** in the Raw_data.

5. Using the LookUp functions, fill up the countries in the original data using the country code.

   Ans→ Added 'CountryName' column to the original data using the country code and by applying vlookup function on country description sheet

   - **=VLOOKUP($C2,'country description'!$A$1:$B$16,2,0) [ref. 'Raw Data' Column D]**
   - **Country description**

6. Create a table to represent the number of restaurants opened in each country.

Ans→ Created pivot table by selecting the cell range 'Raw Data'!$A$1:$X$9543, by choosing insert named ribbon for creating pivot table, column chart as

- **Visualization: Country vs No. of restaurant**
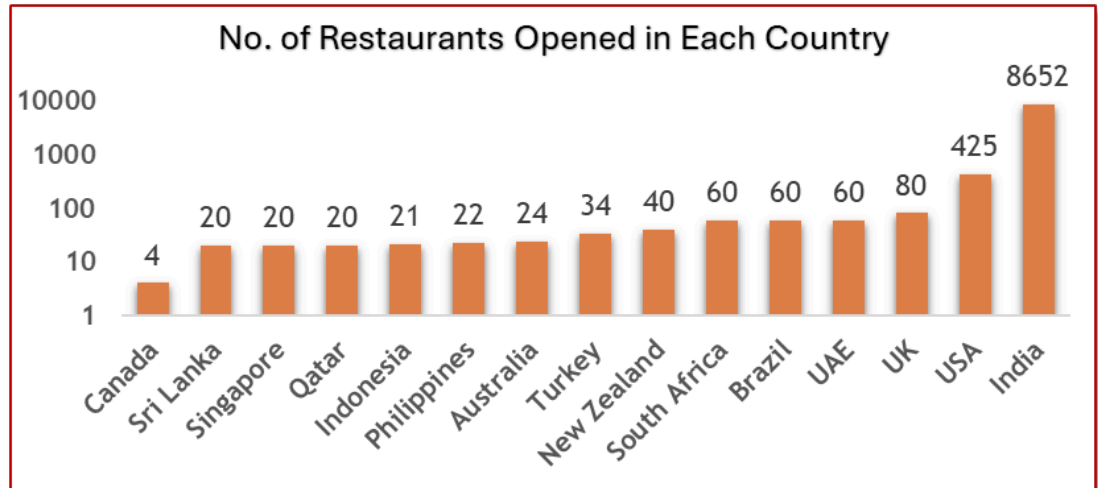
Observation:

- Countries with fewer restaurants: Countries with shorter bars, like *Australia, Turkey, Indonesia, Philippines, Qatar, Canada, Singapore, and Sri Lanka,* indicate lower restaurant densities. These countries might have less competition with restaurants and could present opportunities for new restaurant openings.

- Regions with more restaurants: Conversely, a region like *India, USA, UK, UAE, Brazil, South Africa, and New Zealand,* suggests a higher restaurant density and more competition.

7. Also, the management wants to look at the number of restaurants opened each year, so provide them with something here.

Ans→ Created table by selecting the cell range 'Raw Data'!$A$1:$X$9543, by choosing insert named ribbon for creating pivot table, Column chart as

- **Visualization: Pivot table for Year vs No. of restaurants**
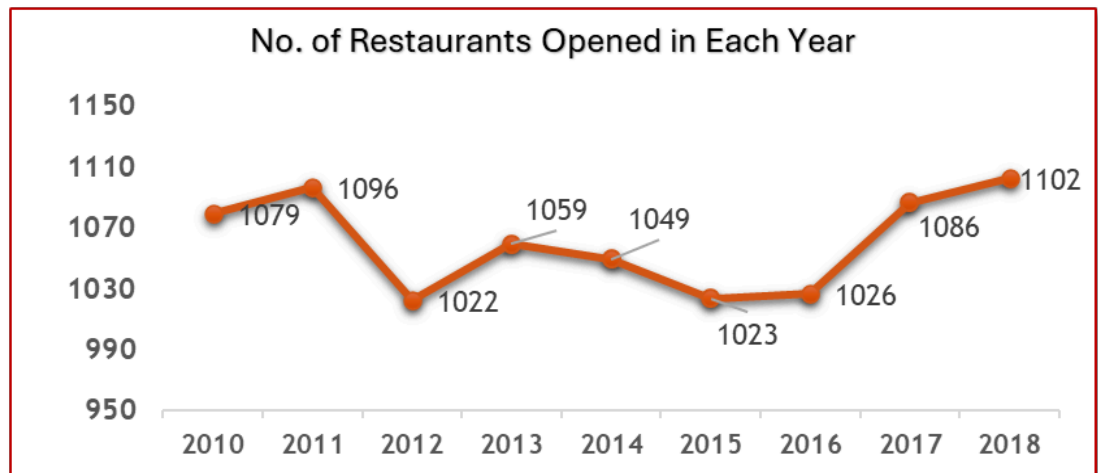
Observation:

- Number of Restaurants opened each year: As Line charts show the number of restaurants opened in 2012 to 2016 was a significant drop that reason could be off-season or restaurants were not making a profit leading to drop in new restaurant openings.

- Years with more restaurants: Conversely, an opening year like *2010-2011 and 2016-2018,* suggests higher restaurant openings and possibly more market demands or seasons.

8. What is the total number of restaurants in India in the price range of 4?

Ans→ Using Conditional aggregation of countifs number of restaurants in India in the price range of 4 can be calculated:
- **[=COUNTIFS('Raw Data'!$D$2:$D$9543,"India",'Raw Data'!$R$2:$R$9543,"4")] [ref. 'country description' H4]**

- **388**

9. What is the average number of voters for the restaurants in each country according to the data?

Ans→ Created pivot table by selecting the cell range 'Raw Data'!$A$1:$X$9543, by choosing insert named ribbon, selecting pivot table and Column chart as:

- **Visualization: Pivot table for Avg. voters vs Country(column chart)**

Country vs Avg. number of votes	
Row Labels	Average of Votes
Brazil	20
Singapore	32
Canada	103
Australia	111
India	137
Sri Lanka	146
Qatar	164
UK	205
New Zealand	243
South Africa	315
Philippines	407
USA	431
Turkey	431
UAE	494
Indonesia	772
Grand Total	**157**

Observation:
- Distribution of Average votes for Each country
- Using the column chart, Indonesia has the highest Avg. no of voters 772
- Brazil has the lowest Avg. no of voters 20

10. Calculate the average rating for all the restaurants that have price_range < 4 and provide online delivery. Use only the "IF" function, Logical Operators, and Aggregation functions to solve this problem. **[Note: Don't use Conditional aggregation in this question.]**

Ans→ Using "IF" function, Logical Operators, and Aggregation functions average rating for all the restaurants is calculated:
- *[=AVERAGE(IF(('Raw Data'!$R$2:$R$9543<4)*('Raw Data'!$O$2:$O$9543="Yes"),'Raw Data'!$W$2:$W$9543))]*

- **3.27381151 [ref. 'country description' H8]**

11. Using Conditional formatting highlight the rows of restaurants that are located in the countries or cities that you've suggested to the management for opening new restaurants.

Ans→ Selecting Home ribbon and using Conditional formatting, new rule, by creating custom formula the suggested rows (having a rating less than <4) of the countries ('CountryName' column) are highlighted in the light red color background for the cells:

- **=OR($D2="Australia", $D2="Canada", $D2="Singapore", $D2="Sri Lanka")**

12. Create a new customized price column that consists of the abbreviation/symbol of the currency along with the Average_cost_for_two value. [Use string operations to do this task]

Ans→ Using concatenate and mid string functions a 'Avg_Price_with_Currency' column that consists of the abbreviation/symbol of the currency along with the Average_cost_for_two value is calculated:

- **=CONCATENATE(MID(L2, FIND("(", L2) + 1, FIND(")",L2) - FIND("(", L2) - 1), T2)**

13. How can you create an array formula in Excel or Google Sheets to count the number of restaurants listed that do not offer online delivery, are in the lowest price range, and have an average cost for two people less than or equal to 250 Indian Rupees?

Ans→ Using the array formula, the number of restaurants counted that offer online delivery, "No", low price range as 1, and avg. of two <= 250 INR calculated:

- **=SUMPRODUCT(('Raw Data'!$O$2:$O$9543 = "No")*('Raw Data'!$R$2:$R$9543 = 1)* ('Raw Data'!$V$2:$V$9543 <= 250))**

- **1691 [ref. 'country description' I14]**

Subjective Question:

1. Suggest a few countries where the team can open newer restaurants with lesser competition. Which visualization/technique will you use here to justify the suggestions?

    Ans→ **[Ref. O-6.Country Vs Res_Opened]**
    Visualization: Using a Column chart to Visualize Country vs. number of Restaurants Opened

No. of Restaurants Opened in Each Country
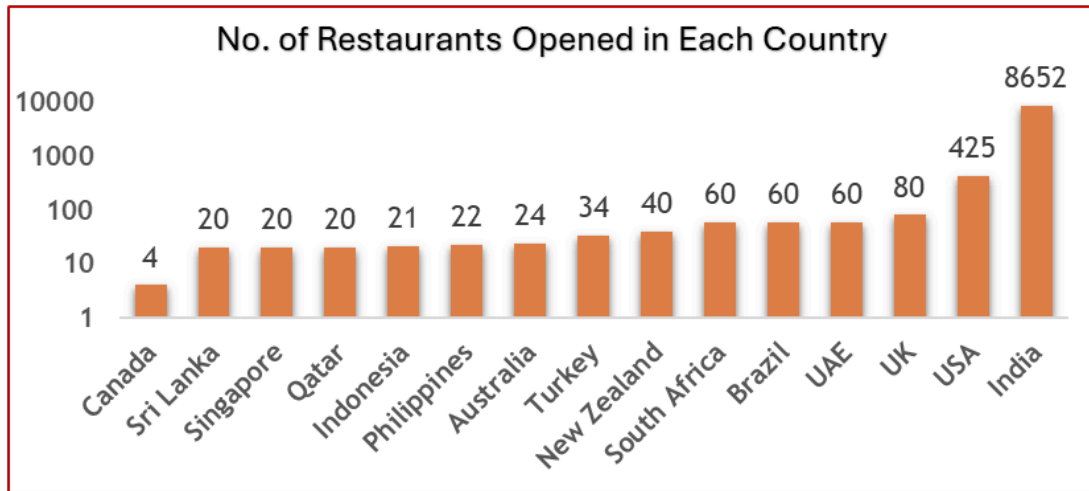
Row Labels	Count of RestaurantID	Average of Rating
Australia	24	3.658333333
Brazil	60	3.846666667
Canada	4	3.575
India	8652	2.770550162
Indonesia	21	4.295238095
New Zealand	40	4.2625
Philippines	22	4.468181818
Qatar	20	4.06
Singapore	20	3.575
South Africa	60	4.21
Sri Lanka	20	3.87
Turkey	34	4.3
United Arab Emirates	60	4.233333333
United Kingdom	80	4.1
United States of America	425	4.014352941
Grand Total	**9542**	**2.890347935**

India (CountryName)
Row: India

Insights & Recommendations:

- Countries with fewer restaurants: Countries with shorter bars, like *Australia, Canada, Turkey, Indonesia, Philippines, Qatar, Singapore, and Sri Lanka* indicate lower restaurant densities < 30.

- Using a pivot table, for lesser competition, we'll choose those restaurants that have ratings below <4. These countries might have less competition compared to other restaurants, which could present opportunities for new restaurant openings.

- Here we are not considering Brazil and India because, even though their ratings are below 4, because they have a higher restaurant density and more competition.

2. Come up with the names of States and cities in the suggested countries suitable for opening restaurants.

    Ans→ **[Ref. S-2.Country/City Vs Rating]**

    Visualization: Using a Pivot table to Visualize Country /City Vs Rating

| Rating	(Multiple Items)	
Row Labels	**Count of RestaurantID**	**Average of Rating**
⊟ **Australia**		
Armidale	1	3.5
Balingup	1	3.2
Dicky Beach	1	3.6
Flaxton	1	3.5
Lorn	1	3.6
Macedon	1	3.5
Mayfield	1	2.9
Montville	1	2.4
Paynesville	1	2.6
Penola	1	3.4
Victor Harbor	1	3.6
⊟ **Canada**		
Consort	1	3
Yorkton	1	3.3
⊟ **Singapore**		
Singapore	9	3.177777778
⊟ **Sri Lanka**		
Colombo	5	3.08
Grand Total	**27**	**3.188888889**

Insights & Recommendations:

- The pivot table represents countries and cities filtered by the average rating of **<=3.5** in the selected countries and count of restaurants present.
- The pivot table represents some cities in the selected countries where team can open new restaurants with less competition.

3. According to the countries you suggested, what is the current quality regarding ratings for restaurants that are open there?

Ans→ **[Ref. S-3.Suggested_Country Vs Avg.Rating]**

Visualization: Using a Pivot table to Visualize Suggested_Country Vs Avg. Rating

Average Rating of Suggested Country

	Value
Canada	3.6
Singapore	3.6
Australia	3.7
Sri Lanka	3.9
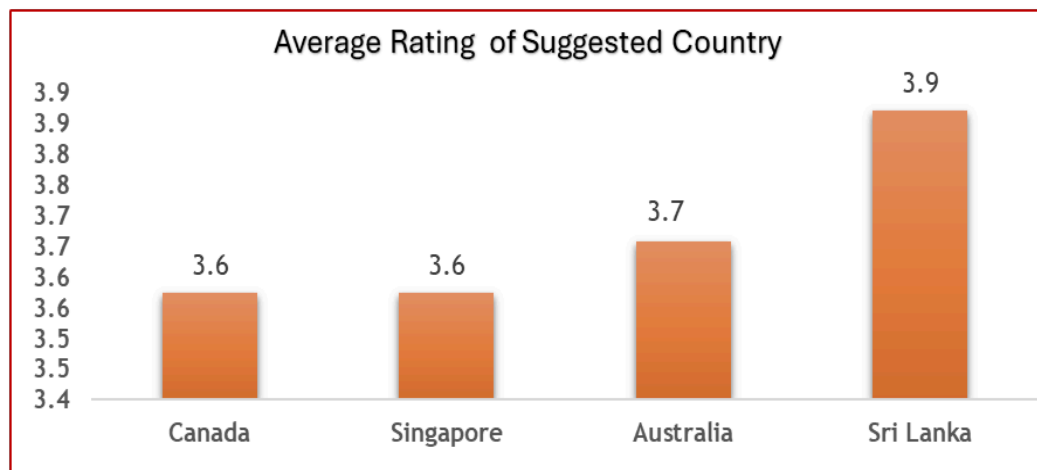
| Row Labels	Average of Rating
Australia	3.7
Canada	3.6
Singapore	3.6
Sri Lanka	3.9
Grand Total	**3.7**

Insights & Recommendations:

- Bar chart from the suggested countries as **Australia, Canada, Sri Lanka, and Singapore** to open new restaurants and respected average rating.

- The pivot table clearly represents that the Average rating of the suggested country is **3.7** and can be a very potential demographic to open new line of restaurants for the existing customers.

4. Also, what is the current expenditure on food in the suggested countries, so we can keep our financial expenditure in control?

Ans→ **[Ref. S-4.Suggested_Country Vs Avg_Cost_of_two(Expenditure)]**

Visualization: Using a Bar chart to Visualize suggested Country Vs. current expenditure on food in Indian Rupees

Row Labels	Avg_Cost_for_two_I
Sri Lanka	₹ 618
Australia	₹ 1,336
Canada	₹ 2,211
Singapore	₹ 9,688
Grand Total	**₹ 3,632**
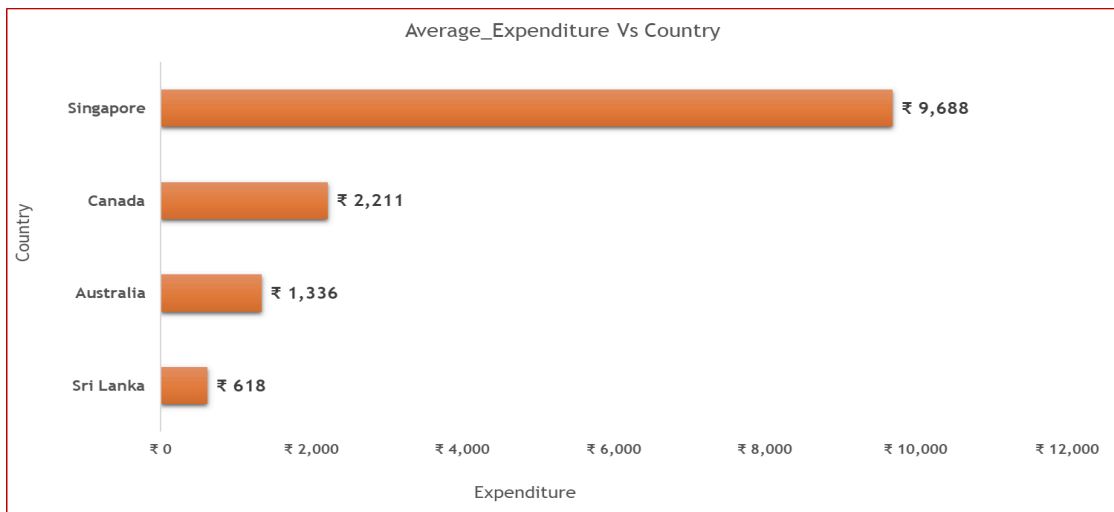
Insights & Recommendations:

- Price Range Preferences: Column chart indicates the Countries and their total expenses on food by taking avg_cost_of_two into account

- Market Positioning: Helps understand how restaurants are positioned in terms of expenses in different countries.

- Market Strategy: In high-expense countries like Singapore (₹9,688), offer premium options. For lower-expense regions like Sri Lanka (₹618), prioritize affordability.

- Pricing Flexibility: Need adaptability in pricing strategies to cater to the prevalent market conditions in each country.

5. Come up with the names of restaurants from the recommended states that are our biggest competitors and also those that are rated in the lower brackets, i.e. 1-2 or 2-3.

Ans→ Pivot table, country-wise city Restaurants Vs Avg rating (3.1- 3.5) in our recommended states (Biggest competitor)

Row Labels	Average of Rating
⊟Australia	3.4
⊟Armidale	3.5
Whitebull Hotel	3.5
⊟Balingup	3.2
Taste of Balingup	3.2
⊟Flaxton	3.5
Flaxton Gardens	3.5
⊟Macedon	3.5
Mr.	3.5
⊟Penola	3.4
DiVine	3.4
⊟Canada	3.3
⊟Yorkton	3.3
Arigato Sushi	3.3
⊟Singapore	3.2
⊟Singapore	3.2
Potato Head Folk	3.1
The Lokal	3.1
Artichoke Cafe	3.2
Boufe Boutique Cafe	3.2
Super Loco	3.2
The Refinery Singapore	3.2
I Am	3.2
Sky On 57	3.4
⊟Sri Lanka	3.5
⊟Colombo	3.5
Chinese Dragon Cafe	3.4
Malay Restaurant	3.5

Rating	(Multiple Items)
S-5	
Row Labels	**Average of Rating**
⊟ **Australia**	**2.6**
Pier 70	2.6
Poets Cafe	2.4
Star Buffet	2.9
⊟ **Canada**	**3.0**
Consort Restaurant	3.0
⊟ **Singapore**	**3.0**
Makansutra Gluttons Bay	3.0
⊟ **Sri Lanka**	**2.5**
Elite Indian Restaurant	2.4
Queen's Cafe	2.5

Visualization: Using a Bar chart to Visualize Restaurants Vs. Avg. rating (1-3) in the (lower bracket)
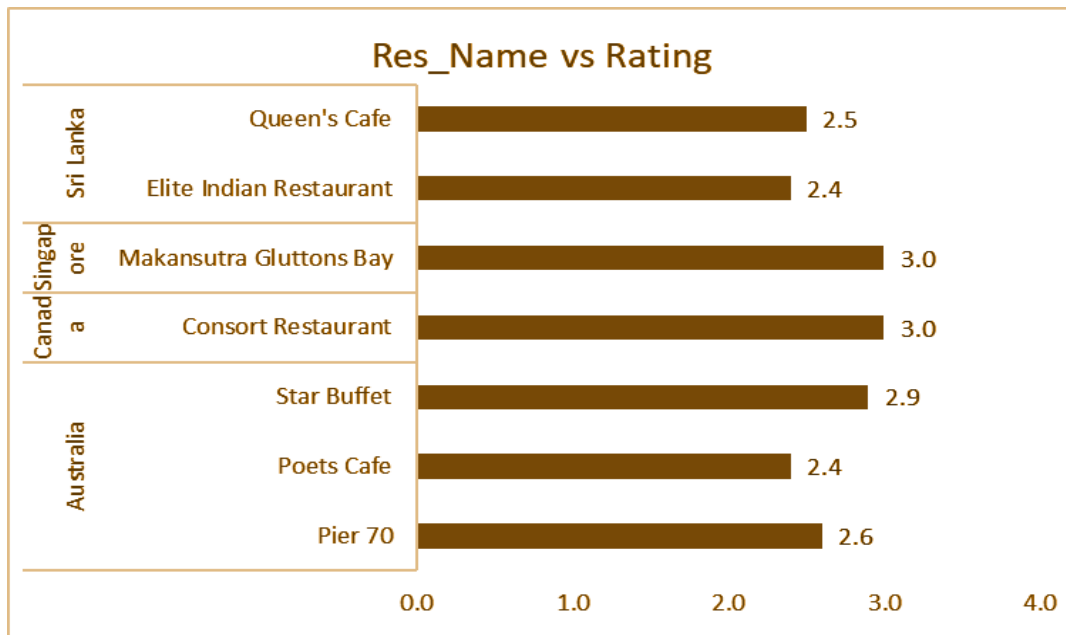
Insights & Recommendations:

- Pivot tables indicate countries having restaurants that are rated in lower brackets i.e., 1-2,2-3
- As shown in the bar chart restaurants having higher rating could be our biggest competitors in the business.

6. Which cuisines should we focus on in the newer restaurants to get better feedback? Does the choice of cuisines affect the restaurant ratings?

Ans→ **[Ref. S-6.Top Cuisine to focus on new reataurants] 'Subjective'**

Row Labels	Average of Rating
⊟ **Australia**	
Pizza, Bar Food	4.6
Mediterranean, Seafood	4.4
Modern Australian, Australian	4.4
⊟ **Canada**	
Italian, Mediterranean, Pizza	4.3
Japanese, Sushi	3.7
Asian	3.3
⊟ **Singapore**	
Bakery	4.2
Italian	4.1
American, Steak	4
⊟ **Sri Lanka**	
Seafood	4.9
Juices, Desserts	4.5
American, Fast Food, Steak, Beverages	4.2
Grand Total	**4.216666667**

Insights & Recommendations:

- Pivot tables indicate restaurants that have better average of ratings for the restaurant offering these cuisines compared to those that are not providing them.

- Based on the data, these cuisines can be great metrics to attract more customers and generate better revenue.

7. According to our current data, should we go for online delivery and table booking? Does that affect the customer's ratings?

Ans→ **[Ref. S-7.Has Online Delivery and Table Booking] 'Subjective'**

Visualization: Pivot table for Online delivery/Table booking Vs Avg. of rating

![zomato]

Has Online Delivery

Row Labels ▼	Average of Rating
No	2.75289804
Yes	3.288004896
Grand Total	**2.890347935**

Has Table Booking

| Row Labels ▼	Average of Rating
No	2.808552004
Yes	3.482556131
Grand Total	**2.890347935**

Insights & Recommendations:

- Pivot tables indicate restaurants that are offering online delivery have better average ratings for the restaurant compared to those that are not providing it.

- Similarly, in the case of online delivery, the average rating is higher than those with no online delivery.

- Based on both insights, it can be derived that the online delivery and table booking services affect ratings, so restaurants should have both services to increase customer ratings.

8. Should the team keep the rate of cuisines higher? Will that affect the feedback? According to our data are the rates of cuisines and ratings, correlated?

Ans→

Visualization: Scatter plot for correlation between Avg. cuisine rate Vs Ratings

Average cost of two in Indian Rupees
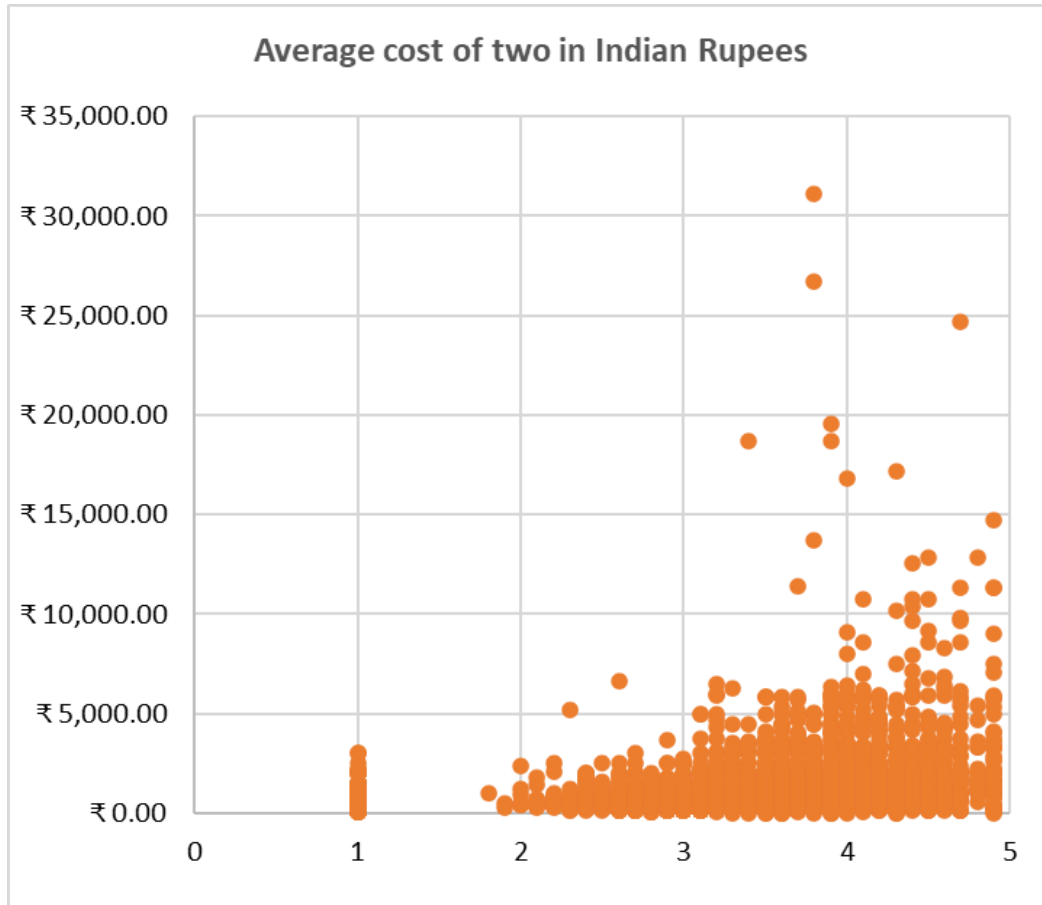
Correlation between rates of cuisines and ratings
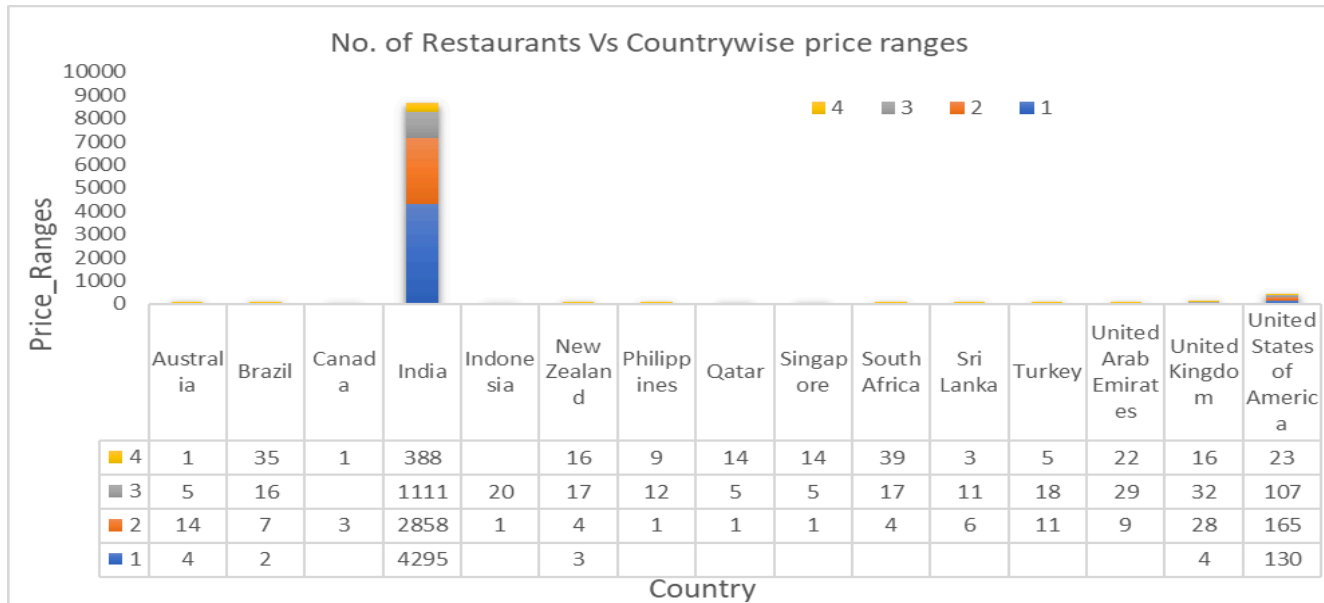
Correlation	0.34459324

Insights & Recommendations:

- Based on the above scatter plot and correlation formula, we can observe that the correlation between avg. cost of cuisine and ratings is positively very low.

- Also, highly rated restaurants are the ones with the high average cost of cuisine or offering more expensive food, which shows a weak correlation.

- The above insights suggest that if the rating is on the higher side for a restaurant, then the team can keep the cuisine rates higher along with a variety of cuisines with lower price ranges as well.

9. What is the distribution of the number of restaurants of different price ranges in all the countries?

Ans→ **[Ref. S-9.Price range Vs Country] 'Subjective'**

Visualization: Stacked column chart for Price range Vs Country

No. of Restaurants Vs Countrywise price ranges

	Australia	Brazil	Canada	India	Indonesia	New Zealand	Philippines	Qatar	Singapore	South Africa	Sri Lanka	Turkey	United Arab Emirates	United Kingdom	United States of America
4	1	35	1	388		16	9	14	14	39	3	5	22	16	23
3	5	16		1111	20	17	12	5	5	17	11	18	29	32	107
2	14	7	3	2858	1	4	1	1	1	4	6	11	9	28	165
1	4	2		4295		3								4	130

Country

Insights & Recommendations:

- The stacked column chart indicates most of the price range variation present at the "India" location due to the large population and parent country of the business, Zomato.

- Also, other Countries include such price range of services that are USA, Brazil, Australia, UK, SA, UAE, NZ, etc.

10. Explain your approach in brief for suggesting countries/cities in order to open new restaurants, if the objective and subjective questions would have not been given to assist you. **[you have to give bullet pointers in order to answer this question]**

Ans→ For opening newer restaurants for Zomato business expansion, I'll make the following strategy:

- I'd start by identifying countries with low restaurant presence but with a higher income per capita. This way, we can target areas where people have more spending power and less competition.

- After identifying target countries, we will further prioritize cities with large populations, maximizing the opportunity to capture a broad customer base in popular urban areas.

- To make the new restaurants more successful, I'd focus on serving cuisines that are already popular with locals. This way, we can cater to existing preferences rather than introducing something entirely unfamiliar.

- As data suggests, online delivery and table-booking services affect customer ratings; I'll provide more such services, such as special offers and free delivery on order value, to attract more customers and improve the overall customer experience.

- By following the mentioned strategies, targeting underserved locations, and aligning with local tastes, we can find the best spots to open new restaurants and make them as profitable as possible.