Zomato Restaurant Expansion

By
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Objective Questions

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

Observation : Checked the Raw Data worksheet and found

1) Raw Data (main dataset)
2) Country description (mappings of codes to country names)

Answer : **2 tables** are present in the dataset (Raw Data + country description)

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

Observation : Counted columns in the original dataset before adding helper columns using the formula **COLUMNS('Raw Data'!A1:T1).**

Original Columns : RestaurantID, RestaurantName, CountryCode, City, Address, Locality, LocalityVerbose, 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.

Answer : **20 Attributes** are present in the given data**.**

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

Approach : Classified each column as **categorical** (descriptive labels) or **continuous** (numeric).

Categorical Columns Identified :

1. RestaurantName
2. CountryCode (later converted to Country)
3. City
4. Address
5. Locality
6. LocalityVerbose
7. Cuisines
8. Currency
9. Has_Table_booking
10. Has_Online_delivery
11. Is_delivering_now
12. Switch_to_order_menu

Answer : As per my observation **12 Categorical Columns** are there in the data.

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

Approach:

- Checked for **duplicates** -> none found.
- Checked for **missing values** in all columns using the COUNT(Column range) function below each column in the Raw Data sheet..
    1. Just one Column Cuisines had **9** missing values in it.
    2. I Imputed the missing values in the Cuisines column with the **Mode** value of the column [**North Indian**].
- Standardized **Datekey_Opening** by extracting the **Opening_year** as a numeric value using the formula VALUE(LEFT(W2, 4)).
    1. LEFT(W2, 4) extracts the first four characters from the Datekey_opening column that is the Year value in String format.

2. VALUE() function around the extracted string year value converts the year from string to Appropriate number format suitable for analysis.

- Ensured consistent text formatting for categorical fields (e.g., "Yes/No").
- Created the **Average_Cost_for_two_INR [Column U]** column as a common currency in INR by adding a table **Currency Rates** in the sheet and using **VLOOKUP(L2, Currency Rates!$A$2:$B$13, 2, False) * S2** formula for further analysis on the same currency level.

Answer: Data was verified as complete, deduplicated, and reformatted for further analysis.

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

Approach: Added a **Country** column (D) to the main table using VLOOKUP.

Formula Used : VLOOKUP(C2, 'country description'!$A$1:$B$16, 2)

In above VLOOKUP formula :

1. C2 = [Search value] The country code value for which the function will return the name of the corresponding Country from the table in the country description sheet.
2. **'country description'!$A$1:$B$16** = [Lookup table] It is the data range in which the VLOOKUP function will search for the country name for the specific search value. The data range is the table in the country description table provided in the given data.
3. **2** = [Index] The third parameter in the VLOOKUP function syntax is index; it is the position of the column in the Lookup table/search range from where we want to extract the matching result. Here **2** is the index of the country column in the country description table.

Answer: Countries successfully mapped to country codes in the separate column Country [Column D] in Raw Data sheet using VLOOKUP.

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

Approach: To solve this question and understand the density of restaurants in each country I created a Pivot Table in the worksheet **Objective Analysis** by taking :

- Rows: **Country**
- Values: Number of Restaurants as **COUNTA(RestaurantID)**

Number of Restaurants across countries	
Country	**Number of Restaurants**
Canada	4
Qatar	20
Singapore	20
Sri Lanka	20
Indonesia	21
Philippines	22
Australia	24
Turkey	34
New Zealand	40
Brazil	60
United Arab Emirates	60
South Africa	60
United Kingdom	80
United States of America	434
India	8652
Grand Total	**9551**

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

I Sorted the above table in ascending order of the number of restaurants across 15 countries.

1. **India** has the highest number of restaurants, accounting for nearly **90%** of total restaurants given in the whole dataset.
2. **The United States of America** follows India to be in second position with **434** restaurants.
3. **The United Kingdom** stands at the third position with **80** restaurants in total.
4. Whereas **Canada, Qatar, Singapore, Sri Lanka, Indonesia and Philippines** are the bottom 6 countries with total restaurants less than **24.**

Answer: Above Pivot table shows the **number of restaurants opened in each country**.

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

Approach: Understanding how many restaurants are opened each year gives the management an idea about how the restaurant market is growing each year across different countries.

I have created the following pivot table which showcases the number of restaurants opened each year in the span of **9** years from **2010 to 2018**.

Number of Restaurants opened per Year	
Year	**Number of Restaurants**
2010	1080
2011	1098
2012	1022
2013	1061
2014	1051
2015	1024
2016	1027
2017	1086
2018	1102
Grand Total	**9551**

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

1. We can clearly observe the above table to understand how many new restaurants opened each year.
2. Almost every year around **1000+** new restaurants are opened consistently across the 15 countries.

Answer: Using above table management can analyse the restaurant market growth year-wise and can make better decisions for expansion.

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

Approach: To solve this question, I used the **COUNTIFS** function

- Formula : **COUNTIFS('Raw Data'!D2:D9552, "India", 'Raw Data'!Q2:Q9552, "4")**

Total number of restaurants in India in Price Range 4
388

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

Answer : There are **388** restaurants in India in the price range of 4.

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

Approach: The average number of voters for the restaurants in each country can be a crucial metric in establishing expansion stratergy.

It helps understand how many customers are engaging in giving the reviews after visiting the restaurant.

I have created a Pivot table as follows which shows the average number of voters across each country.

1. Rows: **Country**
2. Values: **AVERAGE(Votes)**

Average number of voters per country	
Country	**Average No. of Voters**
Brazil	20
Singapore	32
Canada	103
Australia	111
India	137
Sri Lanka	146
Qatar	164
United Kingdom	205
New Zealand	243
South Africa	315
Philippines	407
United States of America	428
Turkey	431
United Arab Emirates	494
Indonesia	772

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

- From the above table we can see that the Top 5 countries with the highest number of voters, that means the customer engagement is very good in these countries indicating positive signs for opening new restaurants.
    1. Indonesia : 772 voters
    2. United Arab Emirates : 494
    3. Turkey : 431
    4. United States of America : 428
    5. Philippines : 407
- Whereas Brazil and Singapore record the least number of average votes 20 and 32 respectively, indicating immediate attention needed to improve the customer engagement there.

Answer : Above table shows average number of voters country wise sorted in ascending order for better understanding.

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.]**

Approach: As it is clearly mentioned in the question to not to use the conditional aggregation function, I have used an ArrayFormula to compute the answer for this question as follows.

Formula : {=**AVERAGE(IF(('Raw Data'!Q2:Q9552 < 4) * ('Raw Data'!N2:N9552 = "Yes"), 'Raw Data'!V2:V9552))}**

In Excel there in no ARRAYFORMULA Function directly available to we have to use Ctrl + Shift + Enter instead of Enter after writing the formula and then the Excel applies curly braces {} around the formula and computes it and gives the result.

Average Rating for all restaurants having price range < 4 and provide Online Delivery
3.27381151

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

I Cross-checked the answer of the above formula with **AVERAGEIFS** to validate it and got the same answer.

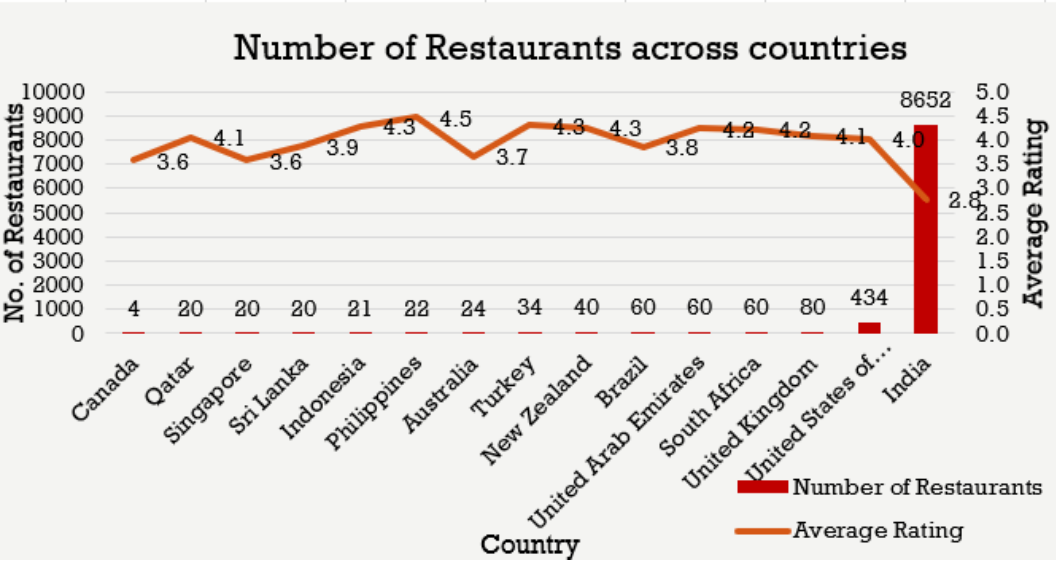
Answer: Average rating of **3.27381151** successfully calculated using only IF, logical operators, and aggregation for the restaurants who provide **Online delivery** and have **Price_range < 4**.

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

Approach:

- To highlight the rows of restaurants that are located in the countries that I've suggested to the management for opening new restaurants I used following two criteria :

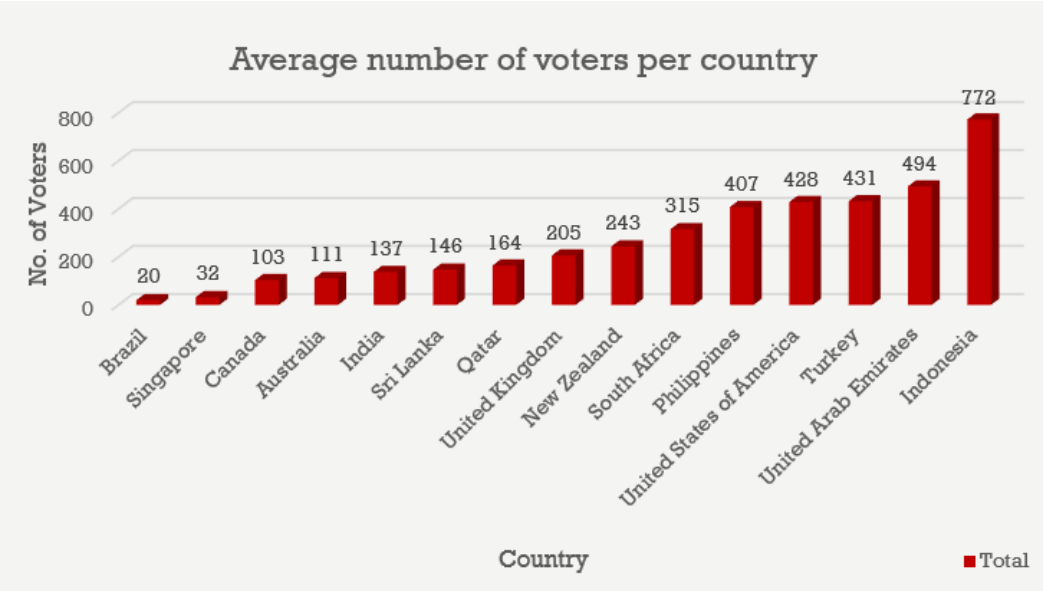
1. **Criteria 1** : Plotted a combined chart with Column and Line chart to understand the number of restaurants across countries and their respective average rating as shown below.



[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

- **Growth Expectancy** : In the above chart we can see that countries like Canada, Qatar, Singapore, Sri Lanka, Indonesia and Philippines have the least number of restaurants indicating the possible growth in terms of new restaurants opening.
- **Average Rating** : All the 6 countries mentioned above have got the average rating above 3.5 stating significant metric for considering these countries for opening new restaurants.

2. **Criteria 2** : Another criteria that can be considered while highlighting the rows would be total number of voters across countries.



[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

- Indonesia has received the highest number of customers voting for the restaurant ratings showcasing highest customer engagement.
- The countries which were observed in the previous Criteria are also holding a significant number of voter base in it.
- Thus, based on these two criteria I came up with the following countries being suitable for opening new restaurants.
    1. Canada
    2. Qatar
    3. Singapore
    4. Sri Lanka
    5. Indonesia
    6. Philippines

- Based on above analysis I Applied **Conditional Formatting** using following **Custom Formula** :

  OR($D2 = "Canada", $D2 = "Qatar", $D2 = "Indonesia", $D2 = "Sri Lanka", $D2 = "Philippines", $D2 = "Singapore")

Answer: Highlighted all restaurants in suggested countries for quick visibility in the new sheet named Highlighted Rows.

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]

Approach: I concatenated the currency abbreviation such as Rs., $, LKR, R etc for respective countries from the currency column by extracting the currency abbreviation and average cost to create the customized price column.

Formula : **MID(L2, find("(",L2)+1, find(")",L2)-FIND("(",L2)-1) & " " & S2**

Custom_Price
Rs. 6000
Rs. 6000
P 6000
Rs. 6500
Rs. 7000
Rs. 8000
R$ 80
R$ 80
IDR 200000
Œ£ 45
Œ£ 55
Œ£ 40
Œ£ 40
QR 60
LKR 2000
TL 60
TL 70
TL 80
TL 90
TL 105
R$ 60
R$ 70
AED 170
IDR 500000
IDR 120000
IDR 300000

[Refer [Column T] in the sheet Raw Data in Excel File Zomato Dataset]

Answer: Created a Custom_Price column displaying values like **Rs. 300, $ 50**, etc.

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?

Approach: Converted **Average_Cost_for_two** to INR in the column **Average_Cost_for_two_INR**, then counted matches with SUM and logical multiplication using following ArrayFormula in Excel

Formula : {=SUM(('Raw Data'!N2:N9552 = "No") * ('Raw Data'!Q2:Q9552 = 1) * ('Raw Data'!U2:U9552 <= 250))}

Number of restaurants that do not offer online delivery, are in lowest price range (1) and have an average cost for two <= 250 INR
1694

[Refer the sheet Objective Analysis in Excel File Zomato Dataset]

In order to make the above formula to take entire array range [column] as a value and return single value as result we need to do Ctrl + Shift + Enter instead of Enter in Excel as it does not has ARRAYFORMULA() function unlike Google Sheets.

Answer: Formula returns **1694** as the count of qualifying restaurants directly, meeting the conditions.

Subjective Questions

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?

Approach : To suggest a few countries where the team can open newer restaurants, I Created a pivot table in the sheet **Subjective 1** showcasing a number of restaurants across countries and also average rating of the restaurants by taking :

- Rows : Country
- Values :
    1. COUNTA(RestaurantID)
    2. AVERAGE(Rating) as shown below

Country	Number of Restaurants	Average Rating
Canada	4	3.6
Qatar	20	4.1
Singapore	20	3.6
Sri Lanka	20	3.9
Indonesia	21	4.3
Philippines	22	4.5
Australia	24	3.7
Turkey	34	4.3
New Zealand	40	4.3
Brazil	60	3.8
United Arab Emirates	60	4.2
South Africa	60	4.2
United Kingdom	80	4.1
United States of America	434	4.0
India	8652	2.8
Grand Total	**9551**	**2.9**

[Refer the sheet Subjective 1 in Excel File Zomato Dataset]

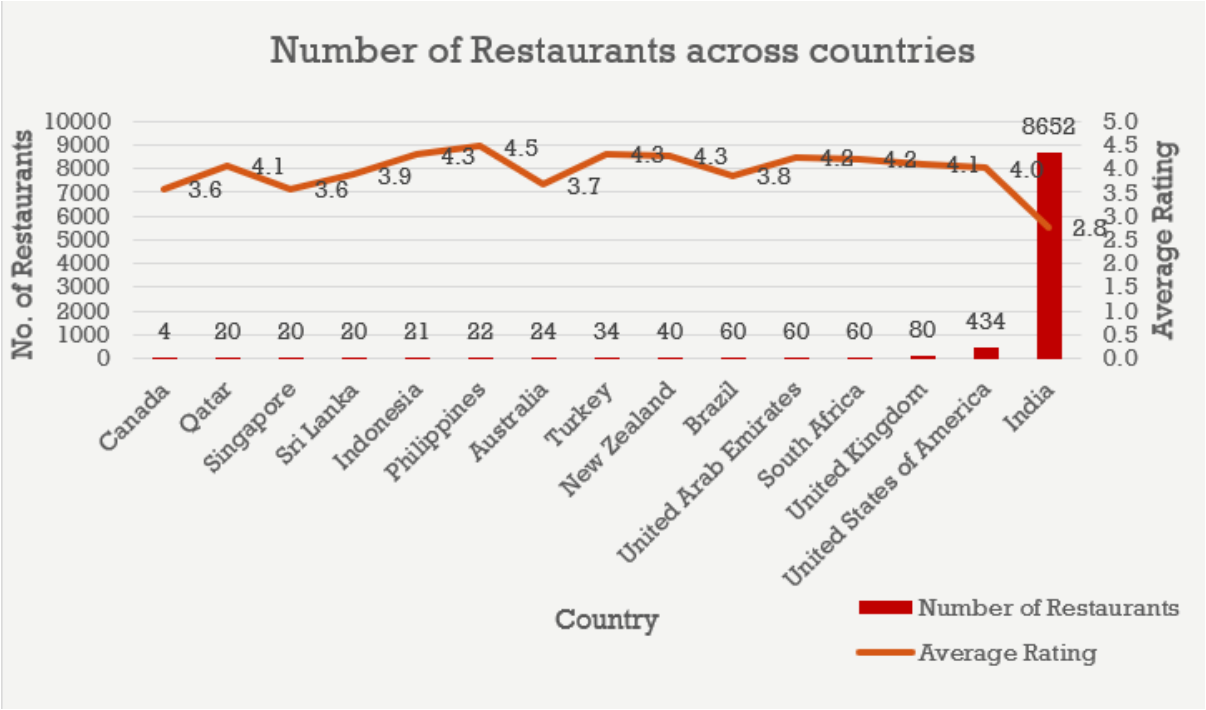
Criteria : Using the following two criteria, I will suggest names of the few countries for opening newer restaurants.

1. **Avoiding High Competition** : The countries with an already high number of restaurants will be the bigger competitors if newer restaurants are opened in those countries.
2. **Considering Low Restaurant Density** : Countries which have very a smaller number of restaurants will be most suitable for expansion as they are a growing market and have a scope for improvement.

3. **High Average Rating** : Just a smaller number of restaurants is not solely enough, countries with good average rating indicates positive adaptation by customers, allowing the team to strongly consider them.

Visualization : Created a Combined Column chart with Line chart from the pivot table as shown below.

1. **X-axis** : Represents Country
2. **Y-axis** [Left/Primary] : Represents Number of Restaurants
3. **Y-axis** [Right/Secondary] : Average Rating



[Refer the sheet Subjective 1 in Excel File Zomato Dataset]

Insights :

- The above Column chart is sorted in ascending order of the number of restaurants by country and the Line chart shows the average rating by each country.
- From the chart we can see that **India** has highest number of restaurants i.e. 8652, followed by United States of America with 434 restaurants making them less suitable for opening new restaurants.
- Similarly, Canada, Qatar, Singapore, Sri Lanka, Indonesia and Philippines are the countries with the least number of restaurants with high average rating making them suitable for opening new restaurants.

Recommendations :

- The top 5-7 countries in the above chart contain the least number of restaurants where there will be lesser competition based on **Criteria 1. And avoiding India as Zomato already has a strong base established in India and is looking for outer expansion**.
- Thus **Canada, Qatar, Singapore, Sri Lanka, Indonesia, and Philippines** are the most suitable countries based on the smaller number of restaurants and high average rating [above 3.5] for opening new restaurants with lesser competition.
- But further analysis is also required to be done considering other factors such as **Price_range** and **Average_cost_for_two.**

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

Approach : The dataset does not contain State information thus to answer this question **city-level analysis** is taken into consideration.

Criteria : To determine which cities are suitable for opening new restaurants in the countries suggested in the previous question, I have considered following two criteria.

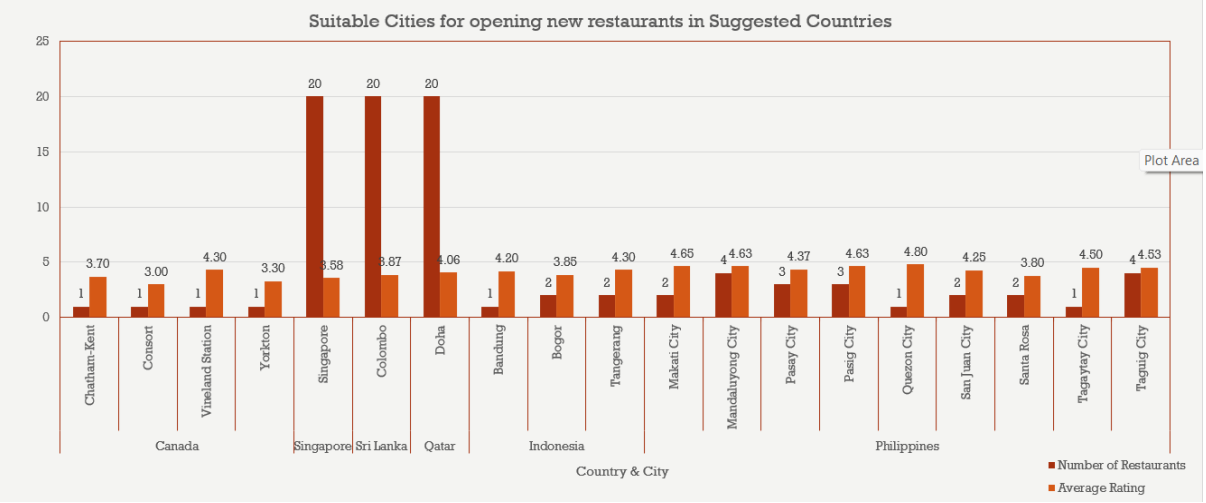
1. **Number of Restaurants :** Within the suggested countries I have decided to consider only those cities in which the restaurant density is low**.**
2. **High Average Rating :** The cities in which the average rating is greater than or equal to 3 are only considered.

The following Pivot table in the sheet Subjective 2 shows the cities fulfilling above two criteria within each country.

Country & City	Number of Restaurant:	Average Rating
Canada	**4**	**3.58**
Chatham-Kent	1	3.70
Consort	1	3.00
Vineland Station	1	4.30
Yorkton	1	3.30
Singapore	**20**	**3.58**
Singapore	20	3.58
Sri Lanka	**20**	**3.87**
Colombo	20	3.87
Qatar	**20**	**4.06**
Doha	20	4.06
Indonesia	**5**	**4.10**
Bandung	1	4.20
Bogor	2	3.85
Tangerang	2	4.30
Philippines	**22**	**4.47**
Makati City	2	4.65
Mandaluyong City	4	4.63
Pasay City	3	4.37
Pasig City	3	4.63
Quezon City	1	4.80
San Juan City	2	4.25
Santa Rosa	2	3.80
Tagaytay City	1	4.50
Taguig City	4	4.53

[Refer the sheet Subjective 2 in Excel File Zomato Dataset]

Visualization : Based on the above pivot table the following chart is created to visually see the cities within each country.



[Refer the sheet Subjective 2 in Excel File Zomato Dataset]

Insights :

- The above column chart showcases the number of restaurants in each suitable city with average rating.
- **Qatar, Singapore, and Sri Lanka** have 20 restaurants in Doha, Singapore and Colombo city respectively making them a dense market for opening new restaurants.

- All other cities have a smaller number of restaurants with higher average rating making them feasible for new restaurant openings.

Recommendations :

- Based on the above chart management should consider following cities as suitable for opening restaurants country wise
    1. Canada **: Chatham-Kent, Consort, Vinland Station, Yorkton**
    2. Qatar **: Doha**
    3. Singapore **: Singapore city**
    4. Sri Lanka **: Colombo city**
    5. Indonesia **: Bandung, Bogor, Tangerang**
    6. Philippines **: Makati City, Mandaluyong City, Pasay City, Pasig City, Quezon City, San Juan City, Santa Rosa, Tagaytay City, Taguig City**

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

Approach : To understand the current quality of restaurants in terms of ratings in the suggested countries, I have created a pivot table in the sheet Subjective 3.

- Rows : Country
- Values : Average of Ratings, Number of Votes [Sum]

Country	Average Rating	Number of Voters
Canada	3.58	412
Indonesia	4.30	16214
Philippines	4.47	8963
Qatar	4.06	3276
Singapore	3.58	638
Sri Lanka	3.87	2929
Grand Total	**4.046**	**32432**

[Refer the sheet Subjective 3 in Excel File Zomato Dataset]

Visualization : A combined column chart with Line chart showcasing the current quality in terms of ratings and in comparison, with number of votes as shown below

[Refer the sheet Subjective 3 in Excel File Zomato Dataset]

Insights :

- **Canada, Singapore, and Sri Lanka** have an average rating of **3.58, 3.58** and **3.87** respectively which less than **4.0**
- Whereas **Qatar, Indonesia and Philippines** have a higher average rating of **4.06, 4.3 and 4.47** respectively.
- Indonesia has got the highest number of votes contributing to the strong average rating of **4.30**

Recommendations : Based on the insights gathered above following are the few suggestions for the team

1. **Focus on Enhancing Quality** : Canada, Singapore and Sri Lanka have been rated less indicating low quality. Try to introduce quality in terms of food or other services in newer restaurants in order to grab customer attention and satisfaction and receive higher ratings and profit.

2. **Introduce Diverse Cuisines** : Qatar, Indonesia and Philippines already have got a strong base considering the ratings, in order to grab customer attention and interaction, provide different types of cuisines.

3. **Special Attention to Indonesia and Phillipines** : As these two countries have got the highest customers voting, implement some special offers/services to cater this wide number of customers for better profits and good word of mouth.

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

Approach : To understand current expenditure on food in suggested countries I created a pivot table in the sheet **Subjective 4**.

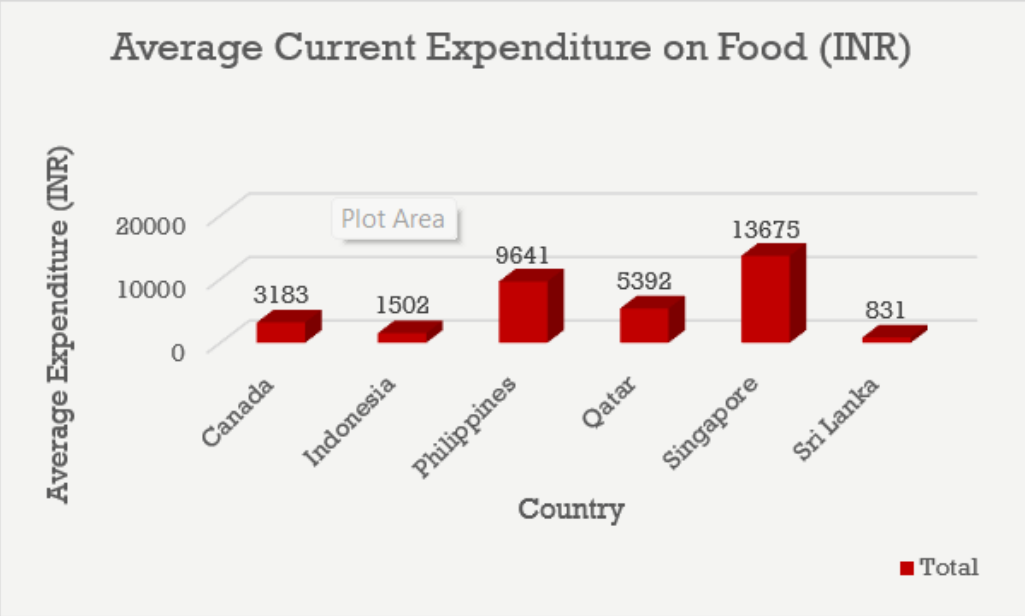
- Rows : Country
- Values : Average of Average_Cost_INR, CountA of RestaurantID

Country	Average of Average_Cost_for_two_INR
Canada	3183
Indonesia	1502
Philippines	9641
Qatar	5392
Singapore	13675
Sri Lanka	831
Grand Total	**6115**

[Refer the sheet Subjective 4 in Excel File Zomato Dataset]

Visualization : Plotted a 3-D Column Chart on the same pivot table by taking

- X axis : Country
- Y axis : Average of Average_Cos_for_two_INR



[Refer the sheet Subjective 4 in Excel File Zomato Dataset]

Insights :

- Average Expenditure on food is less in countries like **Sri Lanka, Indonesia, and Canada.**

- Whereas higher expenditure can be observed in countries like **Qatar, Philippines and Singapore.**

Suggestions :

- Management can make high financial expenditure in **Qatar, Philippines and Singapore** based on the above chart.
- But cost controlled solutions need to be implemented in **Sri Lanka, Indonesia, and Canada**.

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.

Approach : Created two pivot tables in the sheet Subjective 5 to understand the biggest competitor restaurants and those rated in **2-3** average rating brackets.

Visualization :

1. Following table showcases the list of names of restaurants that are our biggest competitors based on the **average rating > 4.0**both country and city-wise.

Biggest Competitor Restaurant Names	Average Rating
Canada	**4.30**
Vineland Station	**4.30**
Lake House Restaurant	4.30
Indonesia	**4.44**
Bogor	**4.00**
Lemongrass	4.00
Bandung	**4.20**
Noah's Barn Coffeenery	4.20
Jakarta	**4.46**
Tangerang	**4.90**
Talaga Sampireun	4.90
Philippines	**4.51**
Santa Rosa	**4.00**
Nonna's Pasta & Pizzeria	4.00
San Juan City	**4.25**
Guevarra's	4.20
Sodam Korean Restaurant	4.30
Pasay City	**4.37**
Buffet 101	4.00
Spiral - Sofitel Philippine Plaza Manila	4.90
Vikings	4.20
Tagaytay City	**4.50**
Balay Dako	4.50
Taguig City	**4.53**
Hobing Korean Dessert Cafe	4.50
NIU by Vikings	4.70
The Food Hall by Todd English	4.50
Wildflour Cafe + Bakery	4.40
Mandaluyong City	**4.63**
Din Tai Fung	4.40
Heat - Edsa Shangri-La	4.40
Ooma	4.90
Sambo Kojin	4.80
Pasig City	**4.63**
Locavore	4.80
Mad Mark's Creamery & Good Eats	4.20
Makati City	**4.65**
Izakaya Kikufuji	4.50
Le Petit Souffle	4.80
Quezon City	**4.80**
Silantro Fil-Mex	4.80
Qatar	**4.35**
Doha	**4.35**
Gokul Gujarati Restaurant	4.30
Gymkhana	4.70
Mainland China Restaurant	4.90
MRA Bakery Sweets & Restaurant	4.00
Paper Moon	4.50
Sabai Thai - The Westin Doha Hotel & Spa	4.30
Texas Roadhouse	4.00
The Manhattan FISH MARKET	4.00
Vine - The St. Regis	4.40
Zaffran Dining Experience	4.60
Zaoq	4.20
Singapore	**4.10**
Singapore	**4.10**
Al'frank Cookies	4.20
Cut By Wolfgang Puck	4.00
Fratini La Trattoria	4.10
Sri Lanka	**4.19**
Colombo	**4.19**
Arabian Knights	4.20
Burger's King	4.10
Butter Boutique	4.20
Cafe Beverly	4.10
Carnival Ice Cream	4.10
Cricket Club Cafe	4.20
Ministry of Crab	4.90
Simply Strawberries By Jagro	4.50
T.G.I. Friday's	4.00
The Commons	4.00
The Manhattan FISH MARKET	4.00
The Sizzle	4.20
Upali's	4.00

[Refer the sheet Subjective 5 in Excel File Zomato Dataset]

2. The following table shows the list of restaurants that fall in the bracket of average rating of **2-3** and can be considered as lesser competitive ones.

Restaurant Names country/city wise	Average Rating (2-3)
Canada	**3.00**
Consort	**3.00**
Consort Restaurant	3.00
Singapore	**3.00**
Singapore	**3.00**
Makansutra Gluttons Bay	3.00
Sri Lanka	**2.45**
Colombo	**2.45**
Elite Indian Restaurant	2.40
Queen's Cafe	2.50
Grand Total	**2.73**

[Refer the sheet Subjective 5 in Excel File Zomato Dataset]

Insights : Above two tables give following insights that can help expansion strategy.

1. The first pivot table directly displays the list of restaurant names country wise that can be our biggest competitors in respective cities within the suggested countries based on the average rating > **4.0**
2. The second pivot table consists of those restaurant names which are rated in the average rating bracket of **2-3,** these restaurants can be considered as less competitive as compared to other ones shown before.

Recommendations :

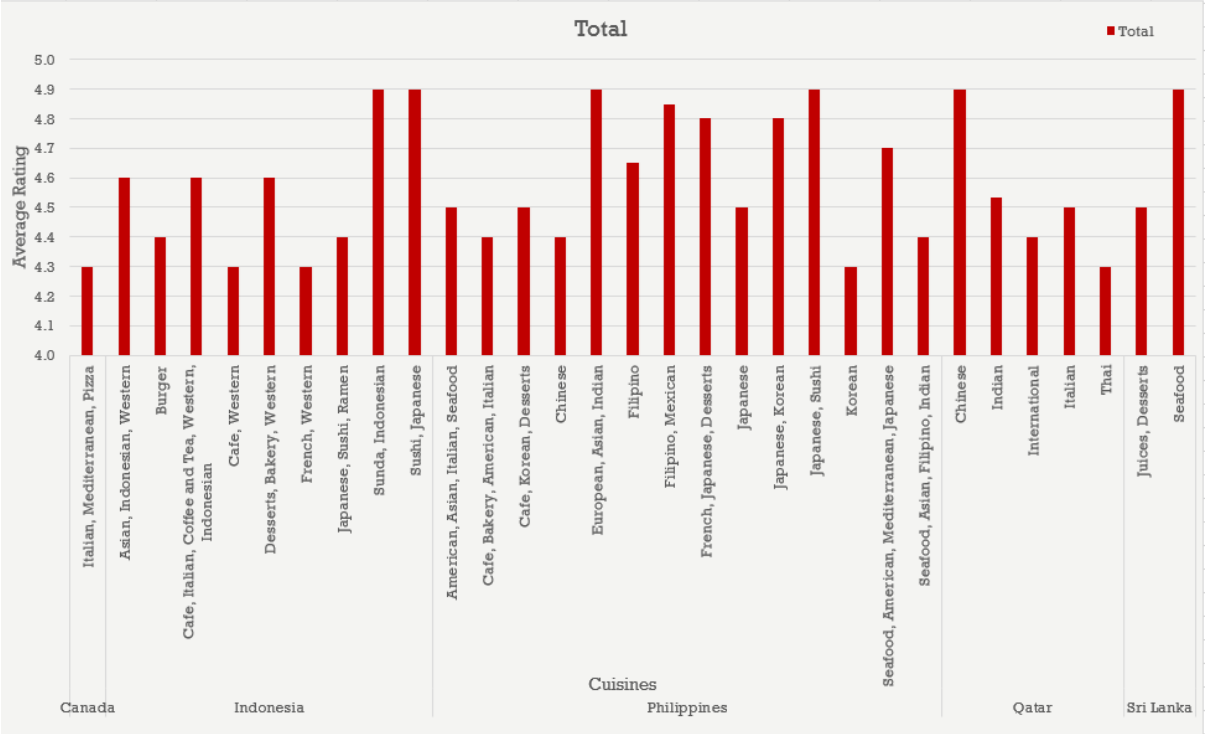
1. **Strategic Planning** : The team has now the understanding of the biggest competitor restaurants, so they need to focus on planning services, cuisines, and other factors to make our restaurants stand out in the market.
2. **Avoid Mistakes** : Identify the mistakes made by the restaurants falling in the lower bracket of 2-3 average rating and not make them in order to be long in the game.
3. **Continuous Feedback** : The team also should focus on gathering the customer feedback to make constant improvements wherever necessary.

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

Approach : Created a Pivot table in the sheet Subjective 6 to identify most popular cuisines to focus on in the newer restaurants in suggested six countries.

- Rows : Cuisines across countries.
- Values : Average of Ratings.

Visualization : Used a **Clustered Column chart** to find the relation between ratings and cuisines.



[Refer the sheet Subjective 6 in Excel File Zomato Dataset]

Insights :

- The above chart shows a few combinations of cuisines having higher ratings.
- From this chart we can understand that the choice of cuisines is very crucial and we need to include these cuisines in our new restaurants.

Recommendations :

- The following **combinations of cuisines** are having a rating greater than **4.5** which must be included in our new restaurants.
    1. American, Asian, Italian, Seafood
    2. Cafe, Korean, Desserts

3. Japanese
4. Filipino
5. Seafood, American, Mediterranean, Japanese
6. French, Japanese, Desserts
7. Japanese, Korean
8. Filipino, Mexican
9. European, Asian, Indian

- **Japanese, American, Filipino, Desserts, Korean, Asian** are the most popular cuisines which we need to focus on in our new restaurants.

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

Approach : Utilized 2 pivot tables in the sheet Subjective 7 to understand whether Online delivery and Table booking affects customer ratings.

Has_Online_delivery	Count of Has_Online_delivery	Average of Rating
No	7100	2.754
Yes	2451	3.288

Has_Table_booking	Count of Has_Table_booking	Average of Rating
No	8393	2.809686644
Yes	1158	3.482556131

[Refer the sheet Subjective 7 in Excel File Zomato Dataset]

Visualization : Plotted two pie charts to understand the distribution of restaurants providing Online delivery and Table booking with those that are not.

[Refer the sheet Subjective 7 in Excel File Zomato Dataset]

Insights :

- The restaurants who offer Online Delivery as well as Table booking have got higher average customer ratings of **3.2** and **3.4**.

- But the restaurants which do not offer both get lower ratings of **2.75 and 2.80** which is lesser than those offering both the services.

Recommendation: Both **Online delivery** and **Table booking** services directly affect the customer ratings thus these services should be offered in new restaurants in order to get higher customer engagement.

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?

Approach : I have used two approaches as shown below to answer this question

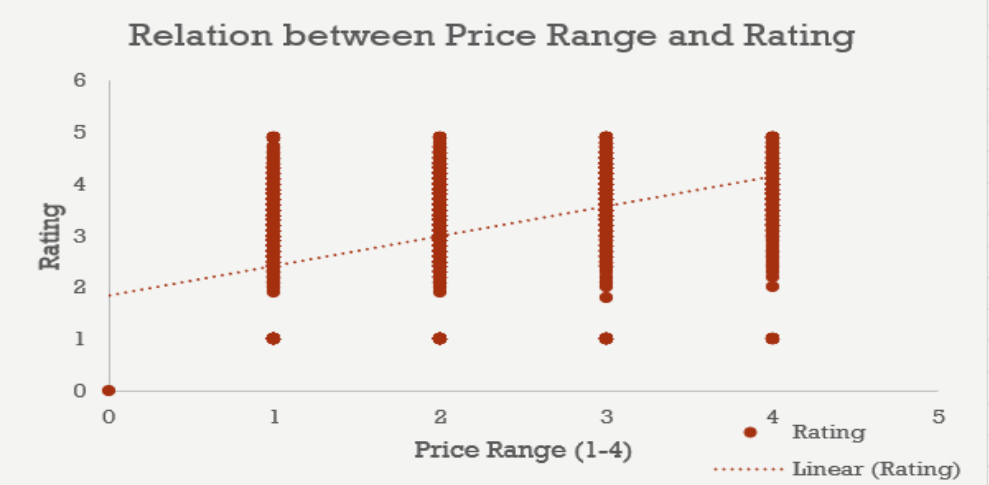
1. Used CORREL function to understand the correlation between **Price_range** and **Rating** columns.
   - Formula : **=CORREL('Raw Data'!Q2:Q9552, 'Raw Data'!V2:V9552)**

Correlation between Price Range and Ratings	0.462939294

[Refer the sheet Subjective 8 in Excel File Zomato Dataset]

2. Inserted pivot table in the Subjective 8 sheet to compare them.

Visualization : Plotted the **Scatter Plot** with Columns Price_range and Ratings to understand the correlation between the two columns.



[Refer the sheet Subjective 8 in Excel File Zomato Dataset]

Insights :

- The inclined line in the graph shows that rating increases positively with the increase in Price_range.
- Also **0.4626** correlation value gives us an idea that these columns are **slightly correlated.**

Suggestions :

- The team **should keep the rate of cuisines higher** because that positively affects the feedback.

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

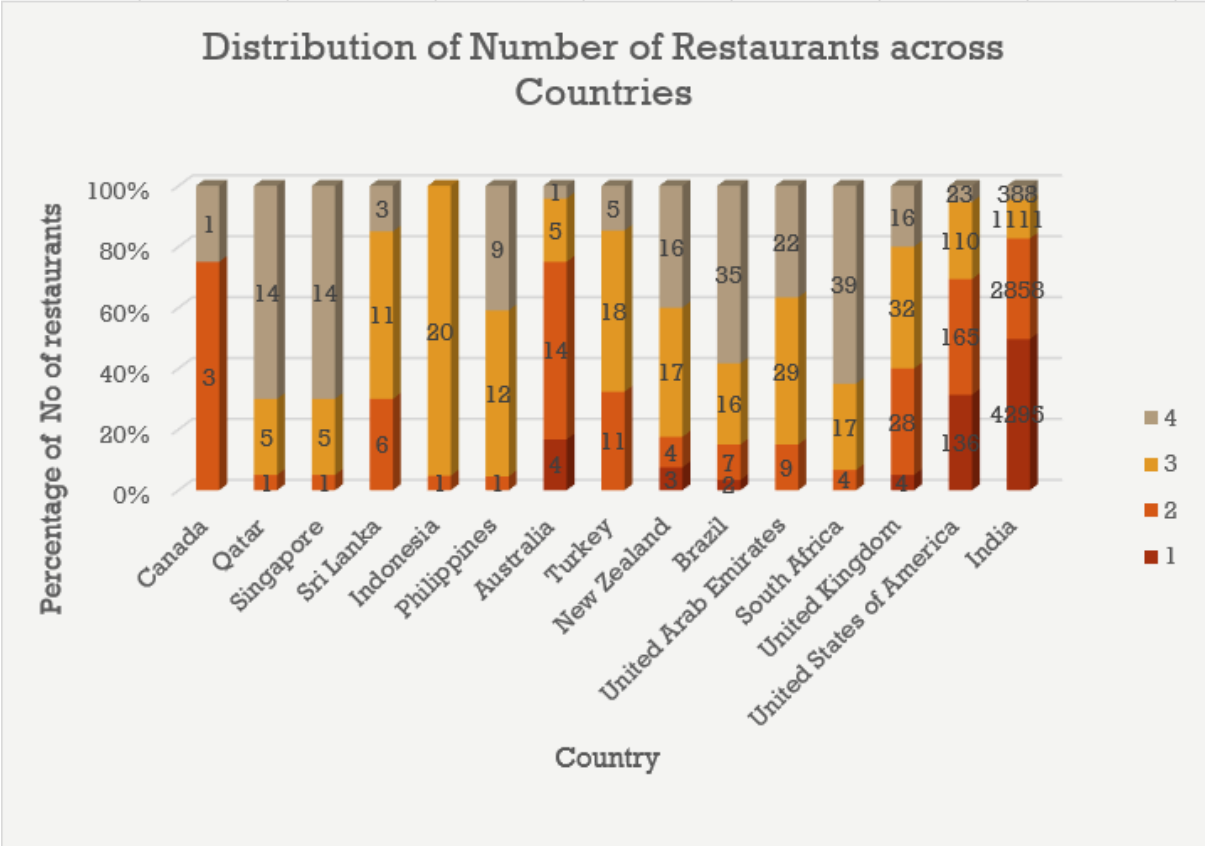
Approach : Utilized the pivot table in the sheet Subjective 9 to understand the distribution of the number of restaurants of different price ranges in all the countries.

- Rows : Country
- Columns : Price Range [1-4]
- Values : Number of restaurants.

Number of Restaurants	Price Range				
Country	1	2	3	4	Grand Total
Canada		3		1	4
Qatar		1	5	14	20
Singapore		1	5	14	20
Sri Lanka		6	11	3	20
Indonesia		1	20		21
Philippines		1	12	9	22
Australia	4	14	5	1	24
Turkey		11	18	5	34
New Zealand	3	4	17	16	40
Brazil	2	7	16	35	60
United Arab Emirates		9	29	22	60
South Africa		4	17	39	60
United Kingdom	4	28	32	16	80
United States of America	136	165	110	23	434
India	4295	2858	1111	388	8652
Grand Total	**4444**	**3113**	**1408**	**586**	**9551**

[Refer the sheet Subjective 9 in Excel File Zomato Dataset]

Visualization : Used a 3-D 100% Stacked Bar chart as shown below



[Refer the sheet Subjective 9 in Excel File Zomato Dataset]

Insights :

- The above graph shows the percentage distribution of the number of restaurants across different countries.
- Majority of the countries have maximum distribution with **Gray portion** in the bar as **Price_range as 4.**
- Except for **India** and the **United States of America** all the countries have higher price ranges.

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]**

If the Objective and Subjective questions would have not been given, I would have taken the following steps to solve the problem.

- Clean and standardize data (remove duplicates, fix formats, convert currencies).

- Count restaurants by country/city to assess **competition levels**.
- Analyse **average ratings** and **votes** to gauge demand and quality.
- Review **average cost for two (INR)** to ensure pricing aligns with spending patterns.

- Identify **major competitors** and gaps (low-rated, high-vote restaurants).
- Evaluate **cuisine performance** and its effect on ratings.
- Compare ratings for **online delivery** and **table booking** to decide features.
- Rank countries/cities by combined metrics (competition, ratings, cost, cuisine fit).
- Cross-check shortlisted locations with external factors (population, income trends).
- Finalize top recommendations and present with a **dashboard + slicers** for exploration.