# **Tasks**

**Learners have to develop a dashboard to support the answers to the following questions and suggestions for places for newer restaurants.**

**Objective Questions**:

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

* There are 2 tables present in the data
* Raw data
* Country description

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

* 20 attributes in Raw data
* 2 attributes in Country description (country code is the common attribute for both tables)

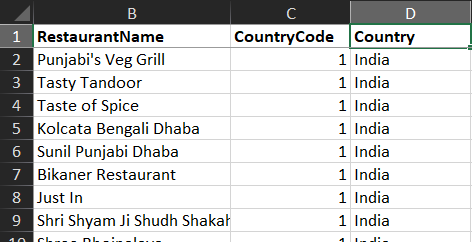
1. How many categorical columns are there in the data? [Search about categorical and continuous data, and try to answer this question]

* Categorical columns represent distinct groups, while continuous data refers to numerical columns (data that can be collected in decimals).
* There are 13 categorical columns.
* The following columns are categorical:
  1. Restaurant ID (unique ID which is not considered as a measure as we cannot apply calculations like sum, average on them)
  2. Restaurant name
  3. Country code (unique code for each country)
  4. Country
  5. City
  6. Address
  7. Locality
  8. Locality/verbose
  9. Cuisine
  10. Has table booking
  11. Has online delivery
  12. Is delivering now
  13. Switch to order menu

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

* 9 missing values found in Cuisines and deleted those rows since there is no clarity of verification.
* Found incorrect city names ÛÁstanbul, Sí£o Paulo and Brasí\_lia, and replaced them to Istanbul, Sao Paulo and Brasilia by Find and Replace method.
* No duplicate values found, each rows are unique.

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

* Inserted column in D and used Vlookup to fetch countries from CountryCode.
* “=VLOOKUP(C2,'country description'!$A$2:$B$16,2,0)
* 

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

* Pivot table: Country in rows, RestaurantID in Values(count)

|  |  |
| --- | --- |
| **Country** | **Count of RestaurantID** |
| Australia | 24 |
| Brazil | 60 |
| Canada | 4 |
| India | 8652 |
| Indonesia | 21 |
| New Zealand | 40 |
| Philippines | 22 |
| Qatar | 20 |
| Singapore | 20 |
| South Africa | 60 |
| Sri Lanka | 20 |
| Turkey | 34 |
| United Arab Emirates | 60 |
| United Kingdom | 80 |
| United States of America | 425 |
| **Grand Total** | **9542** |

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

* Extracted a new column “Year” from “Datekey\_Opening” by using Left() function.
* “=LEFT(U2,4)”
* Pivot table: Year in rows, RestaurantID in Values(count)

|  |  |
| --- | --- |
| **Year** | **Count of RestaurantID** |
| 2010 | 1079 |
| 2011 | 1096 |
| 2012 | 1022 |
| 2013 | 1059 |
| 2014 | 1049 |
| 2015 | 1023 |
| 2016 | 1026 |
| 2017 | 1086 |
| 2018 | 1102 |
| **Grand Total** | **9542** |

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

* **388 restaurants in India** with the price range of 4 which were found using Countifs function.
* “=COUNTIFS('Raw Data'!D:D,"India",'Raw Data'!Q:Q,"4")”

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

* Created a Pivot Table: Country in rows and Votes in Values (Average).

|  |  |
| --- | --- |
| **Country** | **Average of Votes** |
| Australia | 111 |
| Brazil | 20 |
| Canada | 103 |
| India | 137 |
| Indonesia | 772 |
| New Zealand | 243 |
| Philippines | 407 |
| Qatar | 168 |
| Singapore | 32 |
| South Africa | 315 |
| Sri Lanka | 146 |
| Turkey | 431 |
| United Arab Emirates | 494 |
| United Kingdom | 205 |
| United States of America | 431 |
| **Grand Total** | **157** |

1. 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.]**

* Create an Helper column using the formula “=AVERAGE('Raw Data'!U:U)” and then take an average of that helper column by “=AVERAGE('Raw Data'!U:U)” which gives an average of **3.27381151**.

1. 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.

* Canada, Singapore, Qatar and Sri Lanka have low number of restaurants with average ratings below 4.5, so the competition will be lesser in these countries and by focusing on improving the quality of food and service to improve customer satisfaction for higher ratings.
* For conditional formatting, first we will make a Helper column with the help of vlookup formula “=IFNA(VLOOKUP(D2,Subjective!$B$6:$B$9,1,0),"No")” and from that we got filled with suggested country names and the remaining as ‘No’ and after that we will make a Suggested Country column and filter it by Yes for the suggested country and No for others.
* And after that we will put this formula for in conditional formatting custom formula “**=$AA$2:$AA="Yes"”.**

1. 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]

* Inserted a column named “Avg cost with currency” and extracted the data using the below formula.
* “=MID(L2, FIND("(",L2)+1,FIND(")",L2)- FIND("(",L2)-1) & " " & S2”.

1. 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?

* **1691 restaurants** were found.
* First converted average of two values column into Indian rupees and then applied formula.
* “=COUNTIFS('Raw data-table'!N2:N9543,"No", 'Raw data-table'!Q2:Q9543,"1", 'Raw data-table'!U2:U9543,"<=250")”

**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?

|  |  |  |
| --- | --- | --- |
| **Country** | **Number of Restaurants** | **Average of Rating** |
| Canada | 4 | 3.6 |
| Qatar | 19 | 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 | 425 | 4.0 |
| India | 8653 | 2.8 |

**Approach:**

* To open new restaurants, we consider the total number of restaurants available in each country and their average ratings.
* Low number of restaurants may ensure low competition, while low ratings will communicate the quality of restaurants.
* We can see this by inserting a pivot table and a Column chart to get a quick read on the Data.

**Insight:**

* From the pivot table, we can see that Canada, Singapore, Qatar and Sri Lanka, have low number of restaurants with average ratings below 4.5.
* From the column chart, we can notice that India has the highest number of restaurants (about 90% restaurants are located in India.)

**Recommendation:**

* It is suggested to open new restaurants in the below countries
  + - Canada
    - Qatar
    - Singapore
    - Sri Lanka
* As these countries has lesser number of restaurants and lower ratings, the competition will be lesser and focus on improving quality of food and service to improve customer satisfaction for higher ratings.

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

|  |  |  |
| --- | --- | --- |
| **Country-City** | **Number of Restaurants** | **Average of Rating** |
| **Canada** | **4** | **3.6** |
| Chatham-Kent | 1 | 3.7 |
| Consort | 1 | 3.0 |
| Vineland Station | 1 | 4.3 |
| Yorkton | 1 | 3.3 |
| **Qatar** | **19** | **4.1** |
| Doha | 19 | 4.1 |
| **Singapore** | **20** | **3.6** |
| Singapore | 20 | 3.6 |
| **Sri Lanka** | **20** | **3.9** |
| Colombo | 20 | 3.9 |
| **Grand Total** | **63** | **3.8** |

**Approach:**

* To list down the city names for suggested countries, create a pivot table with🡪 Country + City in Rows 🡪 Count of restaurants + Average ratings in Values 🡪 Filter on country with the 4 recommended countries (Canada, Qatar, Singapore and Sri Lanka) selected.

**Insight:**

* From the pivot table, we can see that Canada while having the lowest number of restaurants, the cities Consort and Yorkton have the lowest average ratings.
* Singapore, Qatar and Sri Lanka have their restaurants in only one city.
* Singapore although having the same number of restaurants as Sri Lanka is still lower in terms of average ratings.

**Recommendation:**

* It is suggested to open new restaurants in the below cities
  + - Consort
    - Yorkton
    - Singapore
    - Colombo
* Consort and Yorkton in Canada provide an optimal environment for opening of a new restaurant as they both have only one restaurant under Zomato and also has the lowest average rating among others.
* Singapore has 20 restaurants with an average of 3.6 ratings. Focus on quality of food and providing good customer services should also be given when opening a new restaurant.
* Colombo, Sri Lanka also has 20 restaurants in total with ratings of 3.9.
* Opening new restaurants in these locations would be a great opportunity as there will be low competition and managers can focus more on the customer satisfaction and quality.

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

|  |  |  |
| --- | --- | --- |
| **Country-City** | **Number of Restaurants** | **Average of Rating** |
| **Canada** | **4** | **3.6** |
| Chatham-Kent | 1 | 3.7 |
| Consort | 1 | 3.0 |
| Vineland Station | 1 | 4.3 |
| Yorkton | 1 | 3.3 |
| **Qatar** | **19** | **4.1** |
| Doha | 19 | 4.1 |
| **Singapore** | **20** | **3.6** |
| Singapore | 20 | 3.6 |
| **Sri Lanka** | **20** | **3.9** |
| Colombo | 20 | 3.9 |
| **Grand Total** | **63** | **3.8** |

**Approach:**

* As ratings was assumed as one of the important metrics to take into account. We have inserted average ratings along with the number restaurants to analyse which location would be more suitable for new restaurants.
* We can see in the pivot table with🡪 Country + City in Rows and Count of restaurants + Average ratings in Values. 🡪 Filter on country with the 3 recommended countries (Canada, Qatar, Singapore and Sri Lanka) selected.

**Insight:**

* Canada has an average rating of 3.6. Singapore also with 3.6 ratings. Quatar has 4.1. Sri Lanka has an average rating of 3.9.
* Although, Singapore has the same number of restaurants as Sri Lanka is still lower in terms of average ratings.

**Recommendation:**

* Consort and Yorkton in Canada has lesser ratings (<4.0) compared to other cities where opening a new restaurant is a good idea by improving quality of food and service to improve customer satisfaction for higher ratings.
* Singapore and Sri Lanka also has ratings less than 4.0 but the number of restaurants are high compared to Canada.
* Qatar has 4.1 ratings which is higher compared to other countries.

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

|  |  |
| --- | --- |
| **Country** | **Average of Cost in INR** |
| Canada | 3081 |
| Qatar | 5320 |
| Singapore | 13239 |
| Sri Lanka | 713 |

**Approach:**

* Our raw data consists of multiple currencies. To understand current financial expenses of the countries, we first convert all the prices to one currency.
* After converting all the currency values to their value in INR. We use Pivot table to get a quick read of the average of average cost for two.
* Pivot table🡪 Country in rows (filter on the suggested countries) 🡪 Average cost for two in INR in Values

**Insights:**

* Canada having only 4 restaurants with an average cost of 3081INR, indicates a good opportunity for growth because of low competition and an economical pricing.
* Singapore has the highest average cost amounting up to 13,239INR. This indicates that customers are willing to spend.
* Sri Lanka has the lowest average cost among the suggested countries. This may indicate that people are more budget-conscious.

**Recommendations:**

* Canada shows a significant opportunity for new restaurants because of the less competitive market along with economical expenditure. Expanding here will give us a strong opportunity to capture a good customer base.
* In Singapore, people are willing to spend more. Offering good quality of food and services will further help improving the customer relations.
* As customers are more budget conscious in Sri Lanka, focus on budget friendly restaurant is essential. Offering discounts or combo deals may help in attracting more customers.

1. 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.

|  |  |
| --- | --- |
| Rating | (Multiple Items) |
|  |  |
| **Country-Restaurant Name** | **Average of Rating** |
| **Canada** | **3** |
| Consort Restaurant | 3 |
| **Singapore** | **3** |
| Makansutra Gluttons Bay | 3 |
| **Sri Lanka** | **2.45** |
| Elite Indian Restaurant | 2.4 |
| Queen's Cafe | 2.5 |
|  |  |
|  |  |
|  |  |

* There are total **3** countries(**Canada, Singapore, Sri Lanka**) and **4** restaurants who are coming under the lower brackets i.e. 1-2 or 2-3 , And the **Biggest Competitor** is **Sri Lanka’s Elite Indian Restaurant** whose rating is 2.4.
* Create a Pivot table and add Country, Restaurant Name in Rows and Rating in values and summarise by average function and at last add filters on Country and select suggested **4** countries only i.e.(**Canada, Qatar, Singapore, Sri Lanka)** and add Rating filter select it as 1-2, 2-3.

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Average of Rating** | **Country** |  |  |  |
| **Cuisines** | **Canada** | **Qatar** | **Singapore** | **Sri Lanka** |
| American |  |  | 3.1 |  |
| American, Chinese, North Indian |  |  |  | 2.5 |
| American, Japanese, Singaporean |  |  | 3.2 |  |
| American, Mexican |  |  | 3.2 |  |
| Cafe, Spanish, Turkish, Greek |  |  | 3.2 |  |
| Chinese, Canadian | 3 |  |  |  |
| Italian, French, Bakery, Cafe |  |  | 3.2 |  |
| North Indian, Chinese, Sri Lankan |  |  |  | 2.4 |
| Singaporean, Australian, German |  |  | 3.1 |  |
| Singaporean, Chinese, Seafood, Malay, Indian |  |  | 3 |  |
| Western, Fusion, Fast Food |  |  | 3.2 |  |
| **Grand Total** | **3** |  | **3.15** | **2.45** |

**Approach:**

* To understand which cuisine we should focus on. We can see the least rated cuisines in the suggested countries.
* Pivot table 🡪 Cuisine in rows 🡪 Selected countries in columns 🡪 Average ratings in values.
* Value filter on bottom 10 cuisines with respect to ratings is also applied.

**Insights:**

* Restaurant in Canada serving Chinese and Canadian cuisine is only receiving average ratings.
* Sri Lanka has lowest ratings among the suggested countries with mostly multi-cuisine restaurants.
* Singapore is receiving average ratings in almost all the cuisines available. We can see that the cuisines under Singapore are from all around the world and still rating between 3-3.5.
* Qatar has ratings greater than all the other three countries.

**Recommendation:**

* In Canada, Chinese and Canadian cuisine are rated low. Focus in providing authentic Chinese cuisine with a unique dining experience will help capture the market.
* Sri Lanka is rating low in Asian cuisines. This can be because of poor dining experience or poor quality of food.
* Similarly, Singapore is rating average in all global cuisines. Dining experience and authentic food should be given more importance.
* Singapore and Sri Lanka, both have multi-cuisine restaurants. Which while providing a wide variety of items in the menu are lacking in proving good quality. We can see that both these countries have wider palates, reducing the items on the menu and ensuring good and authentic dishes will be beneficial.

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

|  |  |
| --- | --- |
| **Online Delivery** | **Average of Rating** |
| No | 2.8 |
| Yes | 3.3 |
|  |  |

|  |  |
| --- | --- |
| **Table Booking** | **Average of Rating** |
| No | 2.8 |
| Yes | 3.5 |

* Yes, we can go for online delivery and table booking because the average rating is higher in those restaurants having both online delivery and table booking. And it also affects the rating.
* We created two Pivot tables, one for Table\_Booking and other for Online\_Delivery for finding average ratings in both **Yes** and **No** scenarios.

1. 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?

|  |  |  |
| --- | --- | --- |
| **Cuisines** | **Average of Avg cost in INR** | **Average of Rating** |
| Asian, Continental, Seafood | 18700 | 3.8 |
| Chinese, Continental, Singaporean | 25500 | 3.4 |
| Chinese, Seafood, Cantonese, Dim Sum | 25500 | 3.9 |
| Contemporary | 12840 | 4.5 |
| European, Asian, Indian | 37020 | 4.9 |
| French | 17986 | 4.2 |
| French, Mediterranean, European | 42500 | 3.8 |
| Seafood, American, Mediterranean, Japanese | 18510 | 4.7 |
| Seafood, Asian, Filipino, Indian | 24680 | 4.4 |
| Seafood, Filipino, Asian, European | 12340 | 4.2 |

**Approach:**

* Pivot Table🡪Cuisine in Rows 🡪 Average Rating and Average of Cost in INR in Values.

Top 10 by Average of Price in INR in Value filter.

* A combination chart is used to corelate the metrics.

X-axis = Cuisine

Y-axis = Average of Price in INR (represented in columns)

Secondary Y-axis = Average Ratings (represented with line)

* Use “correl” function to find the Correlation between Cost and Ratings, and the value is 0.31 which is weak.

**Insights:**

* Cuisine "European, Asian, Indian" with a rating of 4.9, has an average cost of 37,020 INR. While, "Seafood, American, Mediterranean, Japanese" has a high rating of 4.7 but a much lower cost of 18,510 INR.
* There are restaurants that are rated high yet have a moderate average cost e.g., "Seafood, American, Mediterranean, Japanese" has a high rating of 4.7 but a moderate cost of 18,510 INR.
* And some that have low ratings yet very high average cost e.g., "French, Mediterranean, European" has a lower rating of 3.8, yet has the highest average cost of 42,500 INR.

**Recommendations:**

* As we can see, there is no corelation between ratings and average cost of the restaurant.
* High ratings can be found at various price points, this indicates that there are other factors that play a significant role in determining the ratings and customer satisfaction.

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

|  |  |
| --- | --- |
| **Price Range** | **Number of Restaurants** |
| 1 | 4438 |
| 2 | 3113 |
| 3 | 1405 |
| 4 | 586 |
| **Grand Total** | **9542** |

**Approach:**

* Pivot Table🡪’Price range’ in rows🡪’Count of RestaurantID’ in values.

**Insights:**

* As evident in the Chart and pivot table, majority of the restaurants (4438 or 46%) fall under the price range of 1. This indicates that most restaurants offer affordable dining experience.
* And only 586 restaurants or 6% are in the price range of 4.
* Number of restaurants gradually reduce as the price range increases which may be because of high cost.

**Recommendations:**

* Opening restaurants in the price range of 1-2 would help us attract a large clients since we know that majority of the market is between these ranges.
* Opening restaurants in higher price range like 3-4 would cater to a small audience, offering unique and special dining experience with good quality food may help attract this clientele as they are willing to pay for better experience.

1. 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]**

* For understanding which countries/cities to open new restaurants in first we need to understand the metrics that are available
* There are two broad metrics that were considered: Number of restaurants available in the country and the ratings.
* With lower number of restaurants available, the competition would be less and management can focus on other decisions like cuisine, quality, availing online delivery and table bookings.
* With respect to lower ratings, opening restaurants that guarantee good quality of food and better customer services alongside working to improve the ratings of the existing restaurants.

**The dashboard must consist of Year-wise and country slicers.**