**Objective Questions:**

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

ANS- The dataset contains 2 tables: 'Raw Data' and 'Country Description'.

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

ANS- The 'Raw Data' table has 20 attributes.

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

ANS- The 'Raw Data' table has 12 categorical columns.

* RestaurantName
* City
* Address
* Locality
* LocalityVerbose
* Cuisines
* Currency
* Has\_Table\_booking
* Has\_Online\_delivery
* Is\_delivering\_now
* Switch\_to\_order\_menu
* Datekey\_Opening

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

ANS- To clean the data, we can use various techniques such as

* Removing duplicates
* Handling missing values (e.g., using mean, median, or imputation)
* Data normalisation
* Data transformation

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

ANS- We can use the VLOOKUP function to achieve this:

=VLOOKUP(A2, CountryCodes, 2, FALSE)

where A2 is the cell containing the country code, CountryCodes is the range containing the country codes and their corresponding country names, and 2 is the column index of the country name.

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

ANS- Create a Pivot Table to group data by Country and count the number of restaurants.

|  |  |
| --- | --- |
| **COUNTRY** | **COUNT OF RESTAURANT** |
| India | 8652 |
| Australia | 24 |
| Brazil | 60 |
| Canada | 4 |
| 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 | 434 |

The clustered chart above displays the number of restaurants in each country. From the visualization, we can observe that countries like India, the United States, and the United Kingdom have a significantly higher number of restaurants compared to other countries.

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

ANS- Extract the year from Datekey\_Opening and create a Pivot Table to count restaurants by year.

|  |  |
| --- | --- |
| **YEAR** | **Count of Restaurant** |
| 2010 | 1080 |
| 2011 | 1098 |
| 2012 | 1022 |
| 2013 | 1061 |
| 2014 | 1051 |
| 2015 | 1024 |
| 2016 | 1027 |
| 2017 | 1086 |
| 2018 | 1102 |
| **Grand Total** | **9551** |

The bar chart above displays the number of restaurants in each Year. From the visualization, we can observe that in years like 2011, 2018 and 2017 have a significantly higher number of restaurants compared to other years.

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

ANS-

 Select any cell within the data range.

* Go to the Insert tab on the ribbon.
* Click on PivotTable.

In the Create PivotTable dialogue box, ensure the data range is correct and choose to place the PivotTable in a new worksheet or an existing worksheet.

 Set up the Pivot Table:

In the PivotTable Field List, drag the Restaurant ID or any unique identifier to the Values area. This will default to Count of Restaurant ID.

* Drag the Country field to the Filters area.
* Drag the Price range field to the Filters area.

 Filter the Pivot Table:

We will now see dropdowns for Country and Price range in the PivotTable.

* Click the dropdown arrow next to Country, select India, and click OK.
* Click the dropdown arrow next to Price range, select 4, and click OK.

|  |  |
| --- | --- |
| Price\_range | 4 |
| CountryName | India |
|  |  |
| **Count of RestaurantID** | 388 |

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

ANS- Step-by-Step:

* Insert Pivot Table:
* Set up Fields:
* Change Aggregation to Average:

|  |  |
| --- | --- |
| **Row Labels** | **Average of Votes** |
| Australia | 111.4166667 |
| Brazil | 19.61666667 |
| Canada | 103 |
| India | 137.212552 |
| Indonesia | 772.0952381 |
| New Zealand | 243.025 |
| Philippines | 407.4090909 |
| Qatar | 163.8 |
| Singapore | 31.9 |
| South Africa | 315.1666667 |
| Sri Lanka | 146.45 |
| Turkey | 431.4705882 |
| United Arab Emirates | 493.5166667 |
| United Kingdom | 205.4875 |
| United States of America | 428.2211982 |
| **Grand Total** | **156.9097477** |

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.]**

ANS- To calculate the average rating for all restaurants with a price\_range < 4 and that provide online delivery in Excel, using the IF function, logical operators, and aggregation functions (without using conditional aggregation), we can use an array formula. Here’s a step-by-step method:

 **Add the Helper Column Formula**:

Enter =IF(AND(Q4 < 4, N4 = "Yes"), T4, NA()) in cell D2 and drag down to apply it to all rows.

 **Calculate the Average**:

* Enter =AVERAGE(X:X) in an empty cell to get the average rating

The average rating is: **3.27381151**

1. **Using Conditional formatting, highlight the rows of restaurants located in the countries or cities you have suggested to the management for opening new restaurants.**

**ANS-**

 Prepare Your Data:

* Ensure your data includes Restaurant Name, City, Country, and Rating columns. Select the Data Range:

 Open Conditional Formatting:

* Go to the Home tab.
* In the Styles group, click on Conditional Formatting.
* Select New Rule.

 Create a New Rule:

* In the New Formatting Rule dialogue box, select use a formula to determine which cells to format.

 Enter the Formula:

* In the Format values where this formula is true box, enter a formula to check for the specific cities:
* =OR(AND($B2="Wellington", $C2="New Zealand"), AND($B2="Ankara", $C2="Turkey"), AND($B2="Flexton", $C2="Australia"), AND($B2="Forest", $C2="Australia"))
* Adjust the column letters ($B2 and $C2) to match the columns for City and Country in your dataset. Format the Cells:
* Click on the Format button to choose the formatting options (e.g., background colour, font colour).
* Choose the desired formatting and click OK.

 Apply the Rule:

* Click OK again in the New Formatting Rule dialog box to apply the rule.

1. **Create a new customized price column that consists of the abbreviation/symbol of the currency along with the Average\_cost\_for\_two values. [Use string operations to do this task]**

**ANS-**

Identify the Currency Column:

* Ensure have a column that lists the currency abbreviation or symbol (e.g., "INR", "$"). For example, let us say this is in column H.

Identify the Average Cost Column:

* Ensure have a column that lists the average cost for two (e.g., 500). For example, let's say this is in column G.

Insert a New Column:

* Insert a new column next to the average cost column. Let's call this column "Customized Price" and place it in column I.

Use a Formula to Combine Currency and Cost:

* In the first cell of the new column (e.g., I2), enter the following formula

=H2 & " " & G2

* This formula concatenates the currency abbreviation/symbol with the average cost for two people, separated by a space.

 Drag the Formula Down:

* Copy the formula down the entire column to apply it to all rows. We can do this by double-clicking the small square at the bottom-right corner of the cell with the formula.

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?**

**ANS-**

Steps in Excel:

* Identify Relevant Columns:
  + Ensure we have the following columns:
    - Online delivery status (e.g., "Yes" or "No") in column N.
    - Price range in column Q.
    - Average cost for two in column S.
    - Currency in column L (to ensure the cost is in Indian Rupees, INR).
* Use an Array Formula:
  + In Excel, array formulas are entered with Ctrl + Shift + Enter instead of just Enter.
  + Use the following formula to count the number of restaurants that meet the criteria:

=SUM(($N$2:$N$9552="No")\*($Q$2:$Q$9552=1)\*($S$2:$S$9552<=250)\*($L$2:$L$9552="INR"))

* Enter the Formula:
  + Select the cell where we want the result to appear.
  + Enter the formula above.
  + Press Ctrl + Shift + Enter to create the array formula. Curly braces {} will appear around the formula in the formula bar, indicating it is an array formula.

Steps in Google Sheets:

1. Identify Relevant Columns:
   * Ensure we have the following columns:
     + Online delivery status (e.g., "Yes" or "No") in column N.
     + Price range in column Q.
     + Average cost for two in column S.
     + Currency in column L (to ensure the cost is in Indian Rupees, INR).
2. Use an Array Formula:
   * In Google Sheets, array formulas are entered without any special key combinations.
   * Use the following formula to count the number of restaurants that meet the criteria

=SUM(($N$2:$N$9552="No")\*($Q$2:$Q$9552=1)\*($S$2:$S$9552<=250)\*($L$2:$L$9552="INR"))

**Subjective Question:**

**1. Suggest a few countries where the team can open newer restaurants with**

**lesser competition. Which visualisation/technique will you use here to justify**

**the suggestions?**

ANS- The 'Raw Data' sheet includes various columns such as RestaurantID, RestaurantName, COUNTRY, City, Locality, Rating, etc. We'll focus on the number of restaurants per country to identify countries with less competition.

Let's aggregate the data to count the number of restaurants per country and then visualize this information. This will help us identify countries with fewer restaurants.

**Visualisation and Technique:**

**Insights**

The clustered chart above displays the number of restaurants in each country. From the visualization, we can observe that countries like India, the United States, and the United Kingdom have a significantly higher number of restaurants compared to other countries.

**Recommendations**

1. **Focus on Countries with Lesser Competition:**
   * Countries with fewer restaurants, such as Canada, Singapore, Sri Lanka, and Indonesia, present opportunities for new restaurant openings with lesser competition.
   * These countries have fewer existing restaurants, potentially allowing for easier market entry and greater visibility for new establishments.
2. **Consider Market Research:**
   * Conduct detailed market research in these countries to understand local culinary preferences, economic conditions, and regulatory environments.
   * Assess the demand for different types of cuisines and dining experiences.

**2. Come up with the names of States and cities in the suggested countries**

**suitable for opening restaurants.**

ANS-

**Guidelines**:

1. **Market Research**: Conduct thorough market research to understand local preferences and competition.
2. **Location**: Choose locations with high foot traffic and accessibility.
3. **Target Audience**: Identify and target specific demographics, such as young professionals, families, or tourists.
4. **Regulations**: Be aware of local regulations and obtain necessary permits and licenses.
5. **Marketing**: Develop a robust marketing strategy to build brand awareness and attract customers.

**Insights**:

* **Auckland and Wellington** in New Zealand have fewer restaurants compared to other major cities, making them attractive for new ventures.
* **Istanbul and Ankara** in Turkey offer a mix of tradition and modernity, with a growing demand for diverse dining options.
* **Forest and Flaxton** in Australia are major food hubs with high potential for new restaurants, despite the competition.

**Visualisation**: A column chart showing the number of restaurants in key cities of New Zealand, Turkey, and Australia can help visualize the competition and identify potential gaps in the market.

The clustered column chart displays the number of restaurants in various cities across different countries. It helps identify cities where the number of restaurants is lower, indicating areas with more market potential and less competition. This analysis can guide us in selecting cities in countries like New Zealand, Turkey, and Australia, where we can open new restaurants with higher chances of success due to less competition.

**Recommendations**:

1. **New Zealand**: Focus on opening restaurants in Auckland and Wellington due to their growing populations and vibrant food scenes.
2. **Turkey**: Consider Istanbul and Ankara for their mix of local and international cuisine preferences and economic growth.
3. **Australia**: Flaxton and Forest offer high potential due to their diverse populations and high demand for dining experiences.

**3. According to the countries you suggested, what is the current quality**

**regarding ratings for restaurants that are open there?**

ANS-

**Guidelines**:

1. **Data Collection**: Ensure accurate and comprehensive data collection on restaurant ratings.
2. **Segmentation**: Segment the data by country and city to identify specific trends.
3. **Comparison**: Compare the average ratings across different countries and cities to spot areas with higher or lower customer satisfaction.
4. **Contextual Analysis**: Consider local dining preferences and cultural factors that might influence ratings.

**Insights**:

* **High Ratings**: Cities or countries with higher average ratings might indicate better customer satisfaction and higher standards of service and food quality.
* **Low Ratings**: Areas with lower average ratings might require improvements in service, menu offerings, or overall customer experience.

**Visualisation**: A Pie chart showing the average ratings of restaurants in each country can help visualize the quality of restaurants in these countries.

**Recommendations**:

1. **Focus on High-Rating Areas**: Consider expanding in cities or regions with higher average ratings as they indicate better market conditions and customer satisfaction.
2. **Improve in Low-Rating Areas**: Identify and address the reasons for low ratings in certain areas. Focus on improving service, food quality, and overall customer experience.
3. **Customer Feedback**: Regularly gather and analyse customer feedback to understand their preferences and expectations better.
4. **Training and Quality Control**: Invest in staff training and quality control measures to maintain high standards and improve customer satisfaction.

**4. Also, what is the current expenditure on food in the suggested countries, so**

**we can keep our financial expenditure in control?**

ANS-

**Guidelines**:

1. **Data Collection**: Gather data on the average cost for two people dining out in the suggested countries.
2. **Segmentation**: Segment the data by country and city to identify specific trends.
3. **Comparison**: Compare the average costs across different countries and cities to understand expenditure patterns.
4. **Economic Context**: Consider the economic conditions and average income levels in each country to put the expenditure in context.

**Insights**:

* **High Expenditure Areas**: Countries or cities with higher average costs might indicate a higher standard of living and potential for premium dining experiences.
* **Low Expenditure Areas**: Areas with lower average costs might be more price-sensitive, requiring more affordable menu options.

**Visualisation:**

A bar chart showing the average cost for two people dining out in New Zealand, Turkey, and Australia can help visualize the expenditure patterns.

**Recommendations**:

1. **Price Strategy**: Adjust menu prices based on the local average cost for two, ensuring they are competitive and appealing to the target market.
2. **Cost Management**: Monitor and manage operational costs to maintain profitability while offering attractive prices.
3. **Market Positioning**: Position the restaurant appropriately within the market (e.g., affordable, mid-range, premium) based on the local expenditure patterns.

**5. Come up with the names of restaurants from the recommended states that**

**are our biggest competitors and those that are rated in the lower**

**brackets, i.e. 1-2 or 2-3.**

ANS-

**Guidelines**:

1. **Data Filtering**: Filter the dataset to focus on the recommended states and cities.
2. **Rating Segmentation**: Segment the data based on restaurant ratings.
3. **Competitor Analysis**: Identify high-rated restaurants as competitors.
4. **Improvement Focus**: Identify low-rated restaurants to understand common issues and areas for improvement.

**Insights**:

* **High-Rated Competitors**: These are the restaurants you need to benchmark against to understand what they are doing right.
* **Low-Rated Restaurants**: These can provide insights into common pitfalls to avoid and areas where you can differentiate your restaurant.

**Visualization**:

* A bar chart or scatter plot showing the distribution of restaurant ratings in the recommended locations.
* Tables listing the names of high-rated and low-rated restaurants.

**Recommendations**:

1. **Competitive Analysis**: Study high-rated competitors to understand their strengths, such as menu offerings, service quality, and marketing strategies.
2. **Quality Improvement**: Analyze low-rated restaurants to identify common complaints and ensure your restaurant avoids these issues.
3. **Customer Feedback**: Regularly gather and act on customer feedback to improve your restaurant’s ratings.
4. **Benchmarking**: Use high-rated competitors as benchmarks for setting service and quality standards.

**6. Which cuisines should we focus on in the newer restaurants to get better**

**feedback? Does the choice of cuisines affect the restaurant ratings?**

**7. According to our current data, should we go for online delivery and table**

**booking? Does that affect the customer’s 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?**

**9. What is the distribution of the number of restaurants of different price ranges**

**in all the countries?**

**10. Explain your approach in brief for suggesting countries/cities 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]**