**OBJECTIVE QUESTIONS**

**1. What is the Total number of tables present in the data?**

**Observation:**

* There are total of 5 tables.
* There are total of 21 pivot tables.

**2. What is the Total number of Attributes present in the data?**

**Observation:**

In the **Raw data** there are total of **20 attributes.**

i.e., Restaurant ID, Restaurant Name, Country Code, 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 of two, Rating, Date Key Opening.

**3. How many Categorical Columns are there in the data?**

**Observation:**

There are total of **15 Categorical Columns.**

**i.e.** Restaurant ID, Restaurant Name, Country Code, Country Name, City, Address, Locality, Locality Verbose, Cuisines, Currency, Has Table Booking, has online delivery, is delivering now, Switch to order menu, Price Range.

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

**Approach used:**

Data has been cleaned and the missing values were filled.

* “Date key opening” was formatted according to the format “dd/mm/yyyy”- “Date Key opening” provided in the data was not in the correct format and for correcting the format firstly the day, month and date was separated from the date key opening using the concatenate function and then using the DATE function all the components of the date were combined and then the date which was generated was converted to values so that the date can still be there even if the day, month and year column were removed.
* Missing Cuisines were filled using the mode of the dataset according to the restaurant type and location- For filling the missing values in cuisines column, firstly using the filter all the missing value were highlighted and then the missing values were using the mode considering the location, type of restaurant and the cuisines of the similar restaurants. Considering all the conditions, missing values were filled.
* Values in Average cost of two which were “0” were filled as the average of the values. “0” was found in only two countries i.e., “India and United States of America”- Firstly the countries were shortlisted which had the inconsistencies from which we could see that only India and United States of America had the inconsistencies, so the approach of filling the missing values with the average of whole column would not be the appropriate approach as there are many currencies in the column and they have different conversion rates. So, for filling the missing values for country India using the filter function only India was selected and then average of the column was filled in the missing values. Similarly, United States of America was selected using the filter and the average of the column was filled in the missing values.

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

**Formula used:**

* LOOKUP function used for filling the “**Country Name**” is- =XLOOKUP($C2,'country description'!$A$2:$A$16,'country description'!$B$2:$B$16).

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

**Visualization:**

|  |  |
| --- | --- |
| **Row Labels** | **Count of RestaurantName** |
| 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 | 434 |
| **Grand Total** | **9551** |

**7. Number of Restaurants opened each year.**

**Visualization:**

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

**8. Total number of Restaurants in India in the price range of 4?**

**Visualization:**

|  |  |
| --- | --- |
| Price\_range | 4 |
|  |  |
| **Row Labels** | **Count of RestaurantName** |
| India | 388 |

**Approach used:**

* Using pivot table, we can visualize the total number of restaurants in India within the price range of 4.

**Insights:**

* Total number of Restaurants in India in the price range of 4 are- **388**.

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

**Visualization:**

|  |  |
| --- | --- |
| **Row Labels** | **Average of Votes** |
| Australia | 111.42 |
| Brazil | 19.62 |
| Canada | 103.00 |
| India | 137.21 |
| Indonesia | 772.10 |
| New Zealand | 243.03 |
| Philippines | 407.41 |
| Qatar | 163.80 |
| Singapore | 31.90 |
| South Africa | 315.17 |
| Sri Lanka | 146.45 |
| Turkey | 431.47 |
| United Arab Emirates | 493.52 |
| United Kingdom | 205.49 |
| United States of America | 428.22 |

**Approach used:**

* Average number of voters for the restaurants in each country can be found using a pivot table.

**10. Calculate average rating for all the restaurants that have price range < 4 and provide online delivery.**

**Insights:**

* **Average Rating** – **3.27381151**
* **Formula used-:** =AVERAGE(IF((Table1[Price\_range] < 4) \* (Table1[Has\_Online\_delivery] = "Yes"), Table1[Rating]))

**11. Using Conditional Formatting highlight the rows of restaurants that are located in the countries or cities that have been suggested for the opening of new restaurants.**

**Approach used:**

* For formatting the restaurants opened in the recommended cities, Restaurants were filtered using filter and the rows were formatted.
* Rows of the restaurant located in the suggested cities are highlighted in **Green**.

**12. Create a new customized price column that consists of symbol of the currency along with Average cost of two value.**

**Approach used:**

* Currency Symbol was extracted from the currency column using the **Formula:** =MID($L2,FIND("(", $L2)+1,FIND(")",$L2)-FIND("(",$L2)-1)
* Then the Currency Symbol and Average cost of two was further combined in the customized price column using,
* **Formula:** =CONCATENATE($M2,$T2)

**13. How can you create any array formula in excel or google sheets to count the number of restaurants listed that do not offer online delivery, lowest price range, and have an average cost of two less than or equal to 250 Indian rupees?**

**Approach used:**

* For converting the average cost of two into INR, firstly a conversion table is created for different currencies and using LOOKUP function, we can convert all the currencies to INR in different column “Cost in INR”.
* **Formula:** =VLOOKUP($L2,'Currency '!$A$1:$B$13,2,FALSE)\*'Raw Data'!T2
* In Google Sheets following array formula can be executed to generate the appropriate result which will be
* =ARRAYFORMULA(SUM(($O$2:$O$9552="No")\*($R$2:$R$9552=1)\*($V$2:$V$9552<=250)))

**Insights:**

* Count of Restaurants- **1676**

**SUBJECTIVE QUESTIONS**

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

**Visualisation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Count of Price\_range** | **Price Range** |  |  |  |
| **Country** | **1** | **2** | **3** | **4** |
| Australia | 4 | 14 | 5 | 1 |
| Brazil | 2 | 7 | 16 | 35 |
| Canada |  | 3 |  | 1 |
| India | 4295 | 2858 | 1111 | 388 |
| Indonesia |  | 1 | 20 |  |
| New Zealand | 3 | 4 | 17 | 16 |
| Philippines |  | 1 | 12 | 9 |
| Qatar |  | 1 | 5 | 14 |
| Singapore |  | 1 | 5 | 14 |
| South Africa |  | 4 | 17 | 39 |
| Sri Lanka |  | 6 | 11 | 3 |
| Turkey |  | 11 | 18 | 5 |
| United Arab Emirates |  | 9 | 29 | 22 |
| United Kingdom | 4 | 28 | 32 | 16 |
| United States of America | 136 | 165 | 110 | 23 |
| **Grand Total** | **4444** | **3113** | **1408** | **586** |

**Approach used**:

* By using the horizontal bar chart (which is made from the pivot table with restaurant counts in different countries), and by observing the chart we can analyse the countries for opening new restaurants.
* We can observe average ratings of restaurants in different countries using pivot table and can use column chart for better visualization.
* We can observe the count of restaurants according to their price ranges and can target the countries according to the insights.
* We can shortlist countries on the basis of the following criteria:
* **Restaurant Count:** On the basis of number of restaurants present in the countries, we can shortlist the countries ensuring lesser competition and strategizing to maximize the ROI.
* **Price Range:** On the basis of the price range of the food offered in these countries, we can strategize ensuring to offer better facilities than our competition ensuring a successful expansion.
* **Ratings:** On the basis of ratings of the current restaurants we can use the feedback on their restaurants to strategize and make necessary changes to our restaurants so that our restaurants can have an edge on our competitors.

**Recommendations:**

By utilizing the column charts and pivot tables, we can effectively justify our recommendations for opening new restaurants in **Canada, Indonesia, Australia, South Africa, Philippines**. These visualizations will support our strategic planning, helping to ensure a successful expansion with a focus on maximizing ROI, offering competitive pricing, and leveraging customer feedback to enhance service quality.

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

**Visualization:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Row Labels** | **Count of RestaurantName** | **Average of Rating** | **Average of Cost\_in\_INR** |
| **Australia** | **3** | **2.63** | **4756.6** |
| Mayfield | 1 | 2.9 | 1678.8 |
| Montville | 1 | 2.4 | 2518.2 |
| Paynesville | 1 | 2.6 | 10072.8 |
| **Canada** | **2** | **3.15** | **2098.5** |
| Consort | 1 | 3 | 2098.5 |
| Yorkton | 1 | 3.3 | 2098.5 |
| **Indonesia** | **3** | **3.97** | **861.67** |
| Bandung | 1 | 4.2 | 825 |
| Bogor | 2 | 3.85 | 880 |
| **Philippines** | **2** | **4.65** | **6240** |
| Quezon City | 1 | 4.8 | 4992 |
| Tagaytay City | 1 | 4.5 | 7488 |
| **South Africa** | **3** | **4.7** | **3944.67** |
| Inner City | 2 | 4.9 | 5432 |
| Randburg | 1 | 4.3 | 970 |

**Approach used:**

* For suggesting the states and cities, we can observe the count of restaurant in the cities of the country and on the basis of their **rating** and **average cost of two (in INR).**
* We can shortlist the cities and states where we can open new restaurants and it can be done by using pivot tables.
* We can shortlist cities in the recommended countries on the basis of the following criteria:
  + **Restaurant Count:** On the basis of number of restaurants present in the cities, we can shortlist the cities ensuring lesser competition.
* **Ratings:** On the basis of the ratings and feedback of the restaurants we can shortlist cities and ensure success expansion by providing better facilities then our competition.
* **Price Range:** Considering the price range of the restaurants we can create a better strategy to provide facilities ensuring the customer satisfaction.
* **Average Cost of two:** On the basis of average cost of two of the restaurants we can strategize our costs of the food by which can best our competitors.
* **Cuisines:** By providing more popular cuisines than our competitors we can maximize our profits.

**Insights:**

* **Canada-** **Yorkton**, **Consort.**

(Restaurants in these cities have lower ratings and their price range is also less comparing to other states)

* **Indonesia-** **Bandung**, **Bogor.**

(There are few restaurants in these states and by offering facilities like online delivery can increase the revenue as there is no facility of delivery in these cities)

* **Philippines-** **Quezon City**, **Tagaytay City.**

(There are few restaurants in these cities because of which there will be lesser competition in comparison of other cities)

* **Australia-** **Montville**, **Paynesville, Mayfield.**

(There are few restaurants in these cities and they have poor rating so opening new restaurants in these cities can be very successful)

* **South Africa-** **Inner City, Randburg**.

(There are few restaurants in these cities and expansion in these cities can be profitable)

**Recommendation:**

By strategically selecting these cities and implementing targeted marketing and operational strategies, the new restaurants opened can successfully penetrate the market and achieve sustained growth.

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

**Visualization:**

|  |  |
| --- | --- |
| **Row Labels** | **Average of Rating** |
| Australia | 3.658333333 |
| Canada | 3.575 |
| Indonesia | 4.295238095 |
| Philippines | 4.468181818 |
| South Africa | 4.21 |
|  |  |

**Approach used:**

* For observing the ratings in the suggested countries firstly a **pivot table** was created using which we can observe the **average ratings** in the suggested country.
* **Column chart** was created from the pivot table for better visualization which will help us in getting better insights for the expansion.

**Insights:** In the suggested countries, average ratings of restaurants are-

* **Canada**- Canada has average rating of **3.6**
* **Indonesia**- Indonesia has average rating of **4.3**
* **Philippines**- Philippines has average rating of **4.5**
* **Australia**- Australia has average rating of **3.7**
* **South Africa**- South Africa has average rating of **4.9**

**Recommendation:**

Ratings indicate that South Africa and the Philippines are strong candidates for expansion, while Canada and Australia may require more strategic planning to enhance customer satisfaction. By focusing on local preferences and maintaining a high standard of service, we can increase the chances of success in these markets.

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

**Visualization:**

|  |  |
| --- | --- |
| **Row Labels** | **Average Expenditure** |
| Australia | 2021.56 |
| Canada | 3042.83 |
| Indonesia | 1546.55 |
| Philippines | 10026.55 |
| South Africa | 2035.71 |

**Approach used:**

* Suggested countries are **Canada, Indonesia, Philippines, Australia, South Africa**. By using pivot table, we can analyse the current expenditure on food by a country.
* Pivot Table was created using the country name and average of the cost In INR column which would give us the insights of the expenditure.
* Using the pivot table, **clustered column chart** was created so that we can visualize the financial expenditure.
* Using the insights, we can grab an idea of the current financial expenditure of the countries and using that we can make a better approach and create a successful business in the suggested countries.

**Insights:**

From the analysis, we can observe the current expenditure on food in suggested countries and from these insights we can make better strategy for expansion.

**Recommendation:**

* **Set Competitive Pricing**: Using the expenditure insights to establish competitive pricing strategies that align with local spending habits, ensuring the cuisines offered are accessible while maintaining profitability.
* **Budget Allocation**: Allocating marketing and operational budgets based on the expenditure levels in each country, focusing on areas with higher spending we can maximize our investment return.
* **Monitor Financial Trends**: Continuously tracking food expenditure trends in these countries we can adapt our financial strategies and ensure our restaurant remains appealing and financially sustainable in the evolving market landscape.

**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.**

**Visualization:**

|  |  |
| --- | --- |
| City | (Multiple Items) |
|  |  |
| **Row Labels** | **Average of Rating** |
| **Australia** | **2.633333333** |
| Pier 70 | 2.6 |
| Poets Cafe | 2.4 |
| Star Buffet | 2.9 |
| **Canada** | **3.15** |
| Arigato Sushi | 3.3 |
| Consort Restaurant | 3 |
| **Indonesia** | **3.966666667** |
| Lemongrass | 4 |
| Momo Milk | 3.7 |
| Noah's Barn Coffeenery | 4.2 |
| **Philippines** | **4.65** |
| Balay Dako | 4.5 |
| Silantro Fil-Mex | 4.8 |
| **South Africa** | **4.7** |
| Cube - Tasting Kitchen | 4.9 |
| The Whippet | 4.3 |
| Urbanologi | 4.9 |

**Approach used:**

* To find our biggest competitors and also those that are rated in the lower brackets we can use pivot table to find the insights.
* In which we can filter the suggested countries using city as the filter we can shortlist the restaurants and from which can check the average ratings of the restaurants present in the cities.
* By using conditional formatting, we can highlight the restaurants in lower brackets (i.e., ratings in 1-3 range) in this case ratings in lower case are highlighted in red and ratings in higher bracket is highlighted in green this will help in easily visualizing the restaurants with ratings in lower bracket.

**Insights:**

Restaurants from the recommended states that are our biggest competitors are-

* **Canada-** In Canada, **Arigato Shushi** and **Consort Restaurant** are the biggest competitor in each state and they both are rated in the lower brackets.

* **Indonesia-** In Indonesia, **Lemongrass** and **Noah’s Barn Coffeenery** are the biggest competitor in each state and **Momo milk** is the restaurant which is rated in the lower bracket.
* **Philippines-** In Philippines, **Balay Dako** and **Silantro Fil-Mex** are the biggest competitor in each state and no restaurant is rated in the lower bracket.
* **Australia-** In Australia, **Poet’s Café**, **Pier 70** and **Star Buffet** are the biggest competitor in each state and all restaurants are rated in the lower bracket.
* **South Africa-** In South Africa, Cube Tasting Kitchen and The Whippet are the biggest competitor in each state and no restaurant is rated in the lower bracket.

**Recommendation:**

* **Differentiate from Competitors:**

Focusing on unique menu offerings and exceptional service to stand out from lower-rated competitors like Arigato Sushi and Consort Restaurant in Canada, and Poet’s Café and Pier 70 in Australia. We can provide better facilities than the competitors and it will ensure successful expansion and maximize our profits.

* **Leverage Market Gaps:**

In markets like the Philippines and South Africa, where no lower-rated competitors exist, we can position our restaurant as a high-quality alternative to attract discerning customers seeking better dining experiences.

* **Target Improvement Strategies:**

Monitoring the performance of our competitors rated in the lower brackets and identify their weaknesses. We can use the information to implement strategies that directly address common customer complaints, enhancing our restaurant's reputation and customer satisfaction.

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

|  |  |
| --- | --- |
| **Row Labels** | **Average of Rating** |
| Continental, Indian | 4.9 |
| American, Burger, Grill | 4.9 |
| European, Contemporary | 4.9 |
| BBQ, Breakfast, Southern | 4.9 |
| Burger, Bar Food, Steak | 4.9 |

**Visualization:**

**Approach used:**

* It can be observed by the use of pivot table.
* Pivot table was created from which we can see the average ratings of all the cuisines served and from that table.
* we have extracted top 5 cuisines with better ratings and can choose them as cuisines served in our newer restaurants.
* Column chart is created for the visualization of the top 5 cuisines with better ratings from the pivot table which can be observed.

**Insights:**

* Choice of cuisine does affect the restaurant ratings. As certain cuisines have better average ratings than rest of the cuisines.
* i.e., **Continental, Indian, American, Burger, Grill, European, Contemporary, BBQ, Breakfast, Southern, Burger, Bar Food, Steak** would be the cuisines according to analysis which will help in getting better ratings and generating more revenue.

**Recommendation:**

* **Focus on High-Rated Cuisines**: Prioritize offering **Continental**, **Indian**, **American**, **Grill**, and **BBQ** cuisines in new restaurants, as these cuisines have shown to yield better average ratings. This can enhance customer satisfaction and boost reputation.
* **Adapt to Local Tastes**: Customizing these cuisines to reflect local preferences and ingredients, ensuring they resonate with the target market while maintaining authenticity.
* **Monitor Trends and Feedback**: Continuously gathering customer feedback on the cuisines offered and be flexible in adapting the menu based on evolving preferences and seasonal trends to maintain high ratings and customer loyalty.

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

**Visualization:**

|  |  |
| --- | --- |
| **Has Online Delivery** | **Average of Rating** |
| Yes | 3.288004896 |
| No | 2.754309859 |

|  |  |
| --- | --- |
| **Has table booking** | **Average of Rating** |
| No | 2.809686644 |
| Yes | 3.482556131 |

**Approach used:**

* Pivot table can be used for the visualization of the data.
* We can check the average rating of the restaurants offering these facilities.
* By analysing the pivot tables, we can observe the correlation between the facilities i.e., Online delivery and Table booking.

**Insights:**

According to our current data, restaurants which are offering the services of online delivery and table booking has the average rating of **3.6** and the restaurants which are not offering these services have the average rating of **2.7**.

**Recommendation:**

So yes, we should be providing the services of online delivery and table booking as it is going to help in increasing revenue as most of our competitors are not providing these services and it would help in increasing the ratings of the restaurant

**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?**

**Visualization:**

**Approach used:**

* This can be analysed using scatter plot graph.
* By creating a scatter plot graph between rating and average of cost two (in INR).
* We can analyse the correlation between the two, from which we can get insights and can observe that the restaurants with the higher price range have better ratings.

**Insights:**

By analysing the data, we can observe that the restaurants with higher price range have better ratings in comparison of restaurants with low price range.

**Recommendation:**

So, by offering the cuisines in higher price range we can generate more revenue and will have better ratings.

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

**Visualization:**

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

**Approach used:**

* This can be analysed by using 100% Stacked Column Chart.
* Firstly, by creating a pivot table we can observe the distribution of restaurants in all the countries in different price range.
* From the created pivot table, we can create a 100% Stacked Column Chart.
* From the chart we can visualize the percentage of restaurants in the country on the basis of price range.

**Insights:**

From the Stacked column chart, we can observe the percentage of restaurants in different countries on the basis of price range, in which each price range is denoted by different colour. It will help in gaining insights of the price range of restaurants in different countries.

**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.**

**Approach used:**

My approach if the guidelines were not provided for the analysis would be-

* Cleaning the raw data.
* Adding the appropriate columns for the better analysis like Country, Year.
* Creating a pivot table for analysing the number of restaurants in each country.
* Shortlisting the countries with low competition for the suggestions.
* In the suggested countries shortlisting cities with lower number of restaurants and also targeting cities with poor rating.
* Creating various charts for better visualisation.
* Creating an interactive and compact dashboard with all the appropriate data, charts and slicers.