Restaurant Data Analysis

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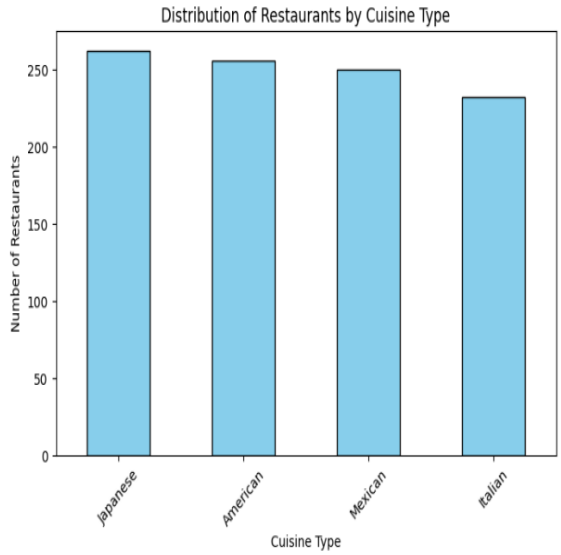
GitHub Link:https://github.com/sushmagone/Statistics-and-Trends/blob/main/Untitled32.ipynb

Introduction:

The dataset used for this analysis focuses on restaurant characteristics by analysing, number of customers, average menu price, marketing spends, type of cuisine, average customer spend, and monthly revenue. This analysis is done to try to obtain possible patterns and relationships that exist among such variables in informing strategic decisions for restaurant management in areas such as marketing budgeting, menu pricing, and engaging customers.

Plot1: Bar Chart: Cuisine Type Distribution

Description



The bar chart provides information on the distribution of restaurants based on the type of food the restaurants serve. It gives a breakdown of restaurants serving Japanese, American, Mexican, and Italian cuisines.

Key Observations:

Japanese Cuisine: Slightly leading, with just over 250 restaurants.

American and Mexican Cuisines: Very closely follow, with each having almost the same number of restaurants, which may indicate the same amount of popularity or market presence.

Italian Cuisine: Slightly fewer restaurants than the other cuisines may indicate that this type of cuisine is less common in this dataset.

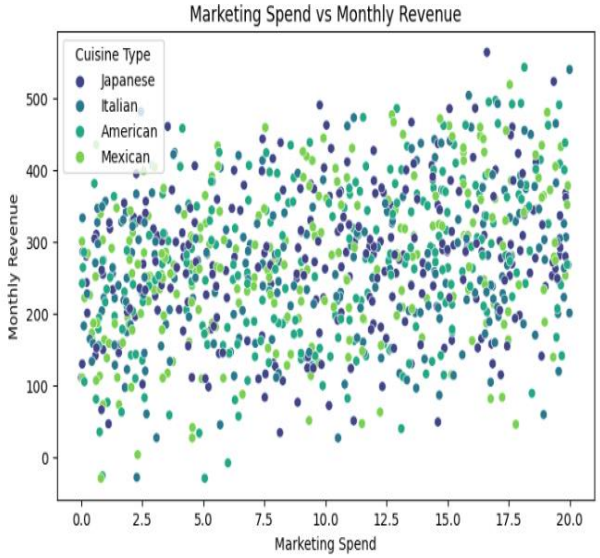
Insights:

Market Saturation: The relatively even distribution between these types of cuisine would suggest a very balanced competitive environment where there is no evidence of one type of cuisine dominating.

Growth Avenues: Fewer Italian restaurants would mean that there is scope for new entrants or even expansion into the Italian cuisine market, considering the demand for this type of cuisine is good in the region.

In other words, the distribution indicates there should be a competitive market that is equally represented by Japanese, American, and Mexican cuisines, while Italian could create growth opportunities. This might be useful in strategic planning involving the restaurant business.

Plot2: Scatter Plot: Marketing Spend vs. Monthly Revenue



This scatter plot examines the relationship between Marketing Spend (x-axis) and Monthly Revenue (y-axis) for restaurants, colouring data points by cuisine type: Japanese, Italian, American, Mexican.

Key Observations:

No Strong Trend: No obvious linear relationship between marketing spends and monthly revenue is evident. It can be seen from the scatter of the points that a higher marketing spend does not necessarily ensure substantially higher revenue.

Scatter across cuisines: All the cuisines have similar scatter patterns, suggesting that marketing spend impacts revenue similarly across cuisines. There is no obvious cluster by cuisine type that would indicate different responses to marketing spending.

Range of Revenue: Revenue varies in a wide range-from near 0 to over 500-across all levels of marketing spend, indicating other factors likely contribute to revenue variations beyond marketing.

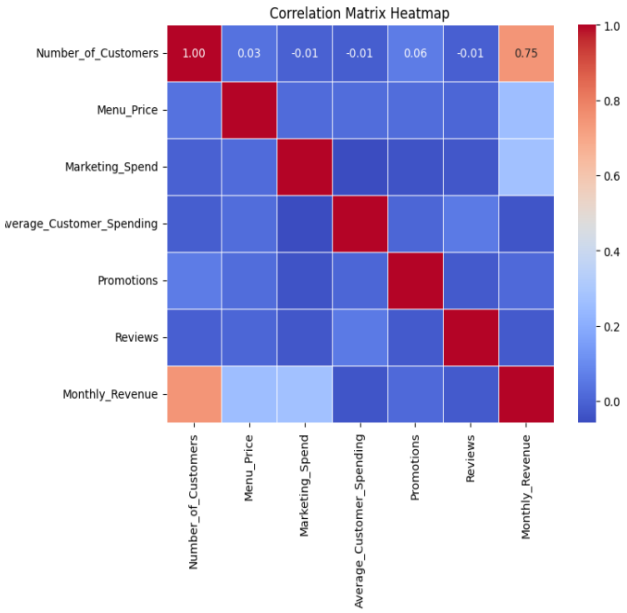
Insights:

Marketing Spend Efficiency: As there is no apparent correlation, merely increasing marketing spend may not necessarily imply a definite and higher revenue on its own. Restaurants will have to creatively devise marketing strategies or alternative means to affect revenue.

Cuisine Impact: Since the distributions of all cuisines are similar, one may need minimal differentiation of marketing strategies with respect to the spend level for various cuisines. Other factors, such as customer engagement or brand loyalty, may still play a differentiating role.

Plot3: Correlation Matrix Heatmap

This heat map represents the correlations among various numeric variables of the restaurant dataset. Correlation values range from -1, while a value close to 0 indicates no linear relationship.



Key Observations:

Number of Customers and Monthly Revenue: The correlation is positively high, 0.75, between the variables of Number of Customers and Monthly Revenue. It therefore denotes that the more the customers, the high revenue achieved within a month; therefore, volume is essential to revenue growth.

Menu Price-Average Customer Spend: From the scatter plot, it can be analysed that a positive relation between Menu Price and Average Customer Spend is found. This means with increased menu prices, the average spending per customer also goes up, indicating a direct relationship between price and spending.

Low or No Correlation: Marketing Spend, Promotion, and Review correlations with Monthly Revenue, and other variables are weak or proximal to zero. That would suggest that these factors might not have a straightforward impact on revenues, at least in a linear sense. An example could be that increased marketing spend does not correlate directly with higher revenues.