**Analysis Report: Restaurant Dataset Insights**

**Introduction**

**This report presents an in-depth analysis of a restaurant dataset using Python. The analysis explores key aspects such as cuisine popularity, city-wise restaurant distribution, price range distribution, online delivery trends, and restaurant ratings.**

**Data Preprocessing**

**The dataset was cleaned by handling missing values, specifically removing entries with null values in the 'Cuisines' column. The structure of the dataset was examined to ensure proper formatting for analysis.**

**Key Findings**

**1. Top Three Most Common Cuisines**

**The dataset was analyzed to determine the three most common cuisines. The results indicate that:**

* **North Indian**
* **Chinese**
* **Fast Food**

**These three cuisines constitute a significant portion of the dataset. A pie chart was created to visually represent their distribution.**

**2. City with the Highest Number of Restaurants**

**By grouping data by city and counting the number of restaurants, the city with the highest number of restaurants was identified. Additionally, the top five cities with the most restaurants were visualized using a bar chart.**

**3. Average Restaurant Ratings by City**

**The average rating for restaurants was computed for each city, and the city with the highest average rating was identified. This analysis highlights areas with the best-rated restaurants.**

**4. Price Range Distribution**

**A bar chart was used to visualize the distribution of price ranges among restaurants. The percentage of restaurants falling into each price range was also calculated.**

**5. Online Delivery Trends**

* **The percentage of restaurants offering online delivery was calculated.**
* **The average ratings of restaurants with and without online delivery were compared. The results indicate that restaurants providing online delivery had a slightly different average rating compared to those that did not.**
* **A pie chart was generated to illustrate the proportion of restaurants with and without online delivery.**

**6. Distribution of Aggregate Ratings**

**A histogram was used to analyze the distribution of aggregate ratings among restaurants.**

**The histogram of aggregate ratings shows that a large number of restaurants have a rating of 0, likely due to missing or unrated entries. Excluding these, the most common rating range appears to be between 3.0 and 4.0, indicating that most restaurants receive average to above-average ratings.**

**7. Average Number of Votes per Restaurant**

**The mean number of votes received by each restaurant was calculated, providing insights into customer engagement levels.**

**8. Most Common Cuisine Combinations**

**The top 10 most frequently occurring cuisine combinations in the dataset were identified. Additionally, an analysis was conducted to determine if specific cuisine combinations tend to have higher ratings.**

**9. Cuisine Combinations and High Ratings**

**An in-depth analysis was conducted to identify cuisine combinations associated with higher ratings. The dataset was grouped by 'Cuisines', and the mean aggregate rating for each cuisine combination was computed and ranked in descending order.**

**10. Geographic Distribution of Restaurants**

**A Folium map was generated to visualize the locations of restaurants using longitude and latitude coordinates.**

* **Markers were added to indicate restaurant locations, with clustering enabled for better visualization.**
* **A scatter plot was created using Seaborn to analyze the geographic distribution of restaurants and identify potential clusters or patterns.**

**11. Restaurant Chains Analysis**

* **The dataset was analyzed to identify the presence of restaurant chains.**
* **A ranking of the most common restaurant chains was created based on frequency.**
* **Popularity analysis was conducted by computing the highest-rated and most-voted restaurants.**
* **The top 10 most popular restaurant chains were displayed.**

**12. Sentiment Analysis of Reviews**

* **The most common positive and negative rating texts were identified.**
* **Reviews were categorized into three sentiment categories: Positive, Neutral, and Negative.**
* **A bar chart was created to illustrate the distribution of restaurant ratings by sentiment.**

**13. Votes and Ratings Correlation**

* **The relationship between votes and aggregate ratings was analyzed using correlation.**
* **A scatter plot was generated to visually explore this relationship, providing insights into customer engagement with highly-rated restaurants.**

**14. Price Range vs. Service Availability**

* **The relationship between price range and service availability (Table Booking & Online Delivery) was analyzed.**
* **Two bar charts were created to show the proportion of restaurants offering table booking and online delivery across different price ranges.**

**Table Booking:**

* **Cheapest restaurants (Price range 1): Almost never offer table booking (0.02%).**
* **Mid-range restaurants (Price range 2): 7.68% offer table booking.**
* **Higher-end restaurants (Price range 3 and 4): Around 45-47% offer table booking, significantly higher than lower price ranges.**

**Online Delivery:**

* **Cheapest restaurants (Price range 1): 15.77% offer online delivery.**
* **Mid-range restaurants (Price range 2): The highest proportion, 41.31% offer online delivery.**
* **Higher-end restaurants (Price range 3 and 4): Decreases to 29.19% (Price 3) and only 9.04% (Price 4).**

**Currently Delivering:**

* **Across all price ranges, very few restaurants are actively delivering at any given moment.**

**Key Findings:**

* **Higher-priced restaurants are far more likely to offer table booking.**
* **Lower-priced and mid-range restaurants are more likely to offer online delivery.**
* **Most expensive restaurants (Price 4) have the least focus on delivery services.**

**Analysis: Table Booking vs. Price Range & Online Delivery vs. Price Range**

**Table Bookings vs. Price Range:**

* **Restaurants with higher price ranges (3 and 4) are much more likely to offer table booking.**
* **Lower price ranges (1 and 2) have very low table booking availability.**

**Online Delivery vs. Price Range:**

* **Mid-range restaurants (Price range 2) have the highest proportion of online delivery availability.**
* **The lowest (1) and highest (4) price range restaurants are less likely to offer online delivery.**
* **Higher-end restaurants (Price range 4) rarely provide online delivery services.**

**Conclusion:**

* **Higher-priced restaurants prioritize table bookings over online delivery.**
* **Lower and mid-priced restaurants focus more on online delivery.**
* **The most affordable restaurants (Price range 1) have the lowest availability of both services.**

**Conclusion**

**This analysis provides valuable insights into restaurant trends, customer preferences, and market distribution. The findings can be leveraged by restaurant owners, food industry analysts, and digital platforms to enhance service offerings and customer satisfaction. Visualizations, including pie charts, bar charts, and histograms, have been utilized to present data effectively. Further analysis can be conducted to explore additional trends and refine business strategies based on customer ratings and preferences.**