Project 1: Data Analysis

— Python Foundations—

FOODHUB

ORDER. EAT. ENJOY.

Tiffany Rhodes

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Contents / Agenda

- Executive Summary
- Business Problem Overview
- Solution Approach
- Data Overview
- EDA - Univariate Analysis
- EDA - Multivariate Analysis
- Appendix

Executive Summary

Key Insights:

- **Data-Driven Insights**: Our in-depth analysis reveals essential consumer trends and operational patterns, providing a foundation for strategic growth at FoodHub.
- **Cuisine Preferences**: American, Italian, and Japanese cuisines dominate consumer demand, presenting clear opportunities for targeted marketing efforts.
- **Delivery Efficiency**: Weekend delivery patterns highlight the need for faster service. Optimizing these can enhance customer satisfaction.
- **Loyalty Programs**: A significant base of frequent customers suggests potential for implementing a specialized loyalty initiative.
- **Service Quality**: Customer ratings reveal diverse feedback, calling for a multifaceted strategy to improve service quality.
- **Delivery Times**: Weekday and weekend delivery consistency is notable, yet there's room to accelerate orders exceeding 60 minutes.
- **Revenue Potential**: Identifying high-value segments emphasizes the importance of refining pricing strategies to maximize profits.

Business Problem Overview and Solution Approach

Problem Overview:

- Navigating the fast-paced food delivery industry requires maintaining exceptional customer satisfaction while achieving operational excellence, a persistent challenge.
- Balancing rapid delivery, diverse culinary offerings, and strong customer loyalty is essential for staying ahead of competitors.

Proposed Solution:

- Our approach relies on comprehensive data analysis to delve into customer preferences, behaviors, and the effectiveness of delivery operations.
- By utilizing advanced analytical tools, we've distilled insights that are driving both tactical improvements and strategic business decisions.

Business Problem Overview and Solution Approach

Methodology:

- Leveraging a blend of univariate and multivariate analytical methods to identify patterns and correlations effectively.

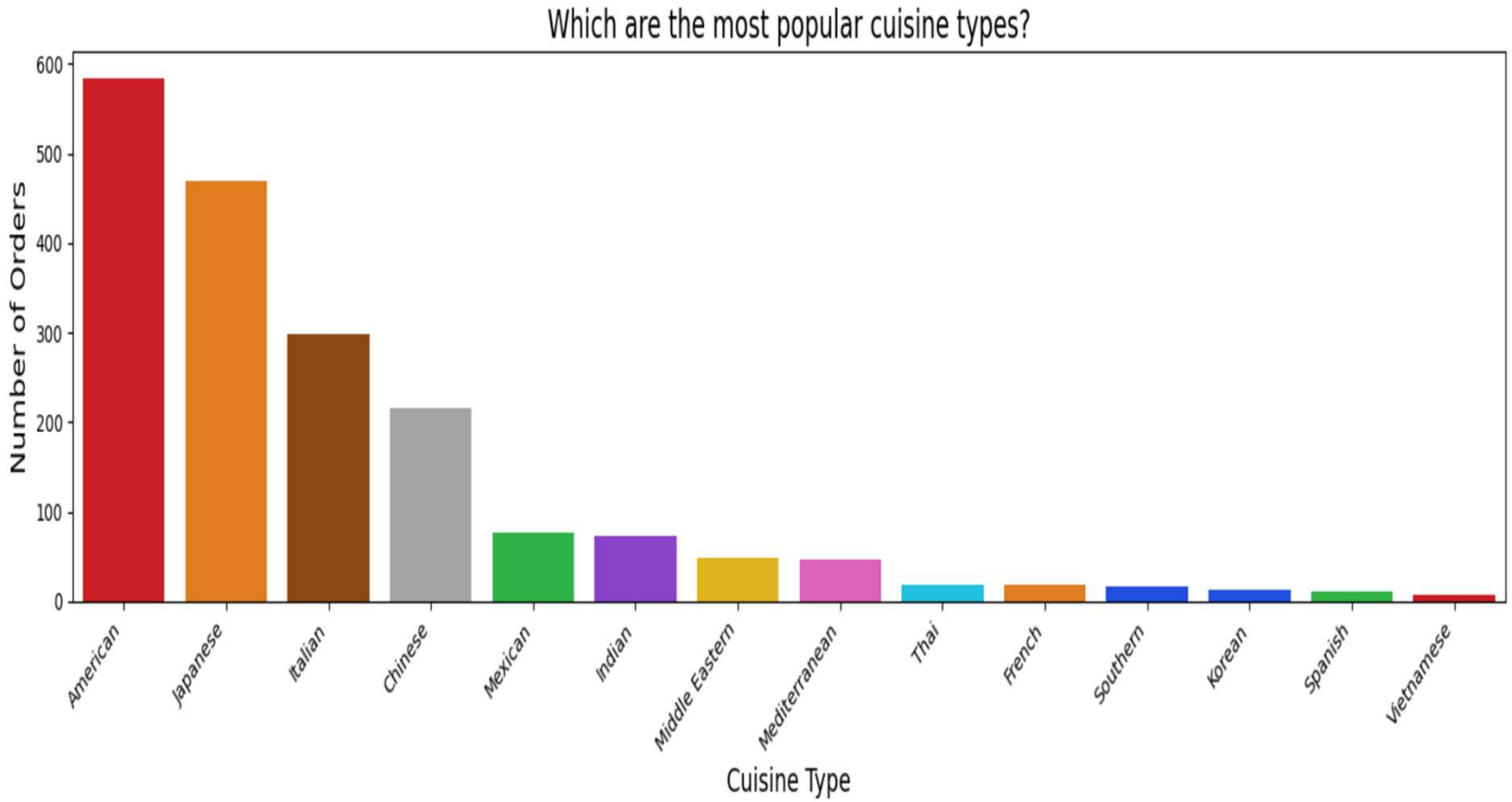
- Establishing a feedback loop to convert customer ratings and reviews into actionable insights for quality enhancement.

- Utilizing predictive analytics to forecast demand fluctuations and streamline the supply chain for optimal performance.

Data Overview

- **order_id:** Unique ID of the order
- **customer_id:** ID of the customer who ordered the food
- **restaurant_name:** Name of the restaurant
- **cuisine_type:** Cuisine ordered by the customer
- **cost_of_the_order:** Cost of the order
- **day_of_the_week:** Indicates whether the order is placed on a weekday or weekend (The weekday is from Monday to Friday and the weekend is Saturday and Sunday)
- **rating:** Rating given by the customer out of 5
- **food_preparation_time:** Time (in minutes) taken by the restaurant to prepare the food. This is calculated by taking the difference between the timestamps of the restaurant's order confirmation and the delivery person's pick-up confirmation.
- **delivery_time:** Time (in minutes) taken by the delivery person to deliver the food package. This is calculated by taking the difference between the timestamps of the delivery person's pick-up confirmation and drop-off information

Univariate Analysis

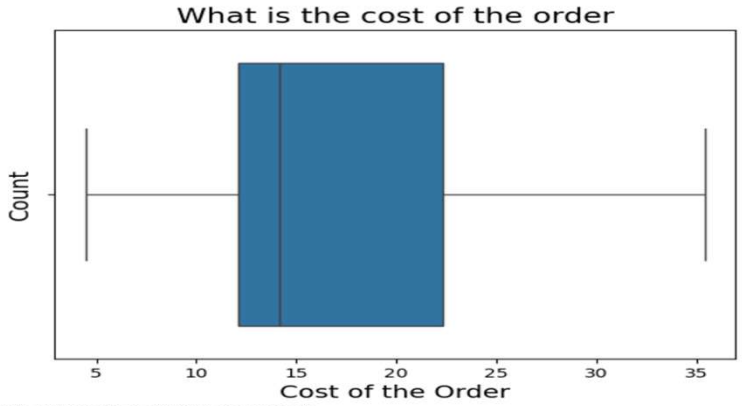


Univariate Analysis

- The analysis highlights clear customer preferences for certain cuisine types, with American, Japanese, and Italian cuisines standing out as top favorites.
- These cuisines have notably higher order frequencies compared to others, like Spanish or Vietnamese, which are ordered less than a tenth as frequently.
- This sharp difference emphasizes the popularity of American, Japanese, and Italian offerings and presents an opportunity for strategic focus. Restaurants might consider enhancing menu options, running promotions, or launching targeted marketing campaigns for these popular cuisines, while also exploring ways to boost the visibility and appeal of other choices

Univariate Analysis

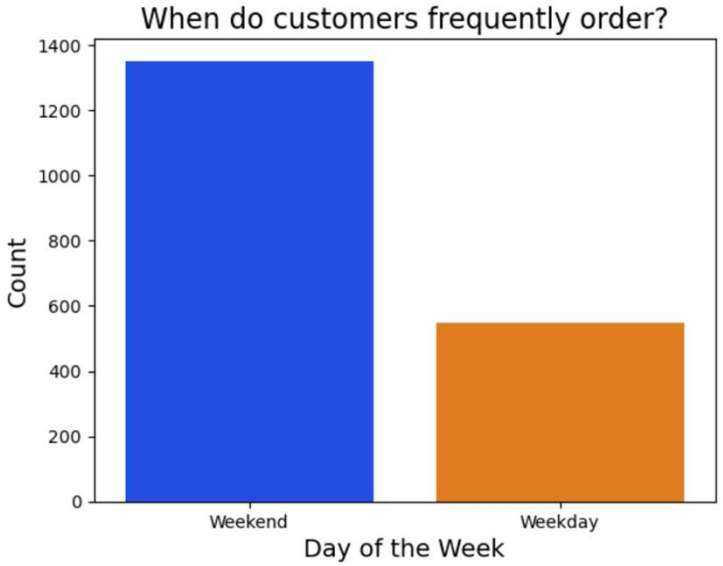
- The average order cost is higher than the median, suggesting that the distribution of order costs is right-skewed.
- The mode of distribution shows that a significant number of customers tend to order food priced around 12-10
- A small number of orders exceed $30, likely representing more expensive meal options



Univariate Analysis

Observations:

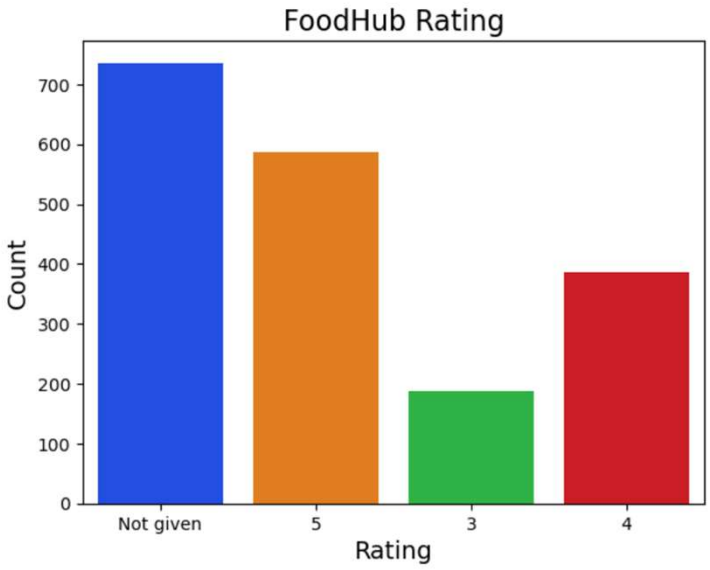
- The day_of_the_week column contains two unique categories:
- Weekday and Weekend.
- The data reveals that the number of orders placed on weekends is roughly twice as high as those placed on weekdays



Univariate Analysis

Observations:

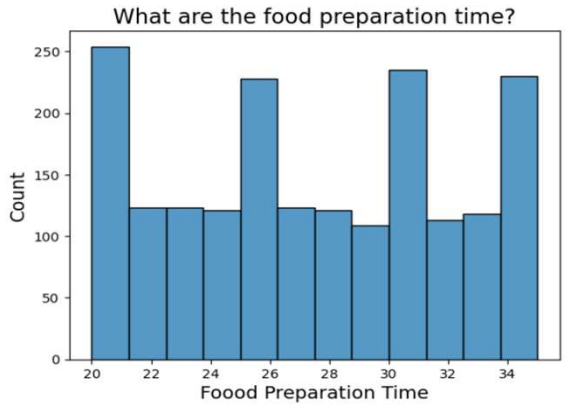
- The analysis reveals the following insights:
- 736 orders have not received a rating. 588 orders were rated 5. 386 orders were rated 4.
- Only 188 orders were rated 3. Among the ratings provided, 5 is the most frequent, followed by 4 and 3



Univariate Analysis

Observations:

- Italian and Thai cuisines have the longest average preparation times, while Korean, Southern, and Vietnamese cuisines require the least.
- Overall, the variability in preparation times across different cuisines is minimal, indicating that most cuisines take a similar amount of time to prepare, with only slight differences.



Univariate Analysis

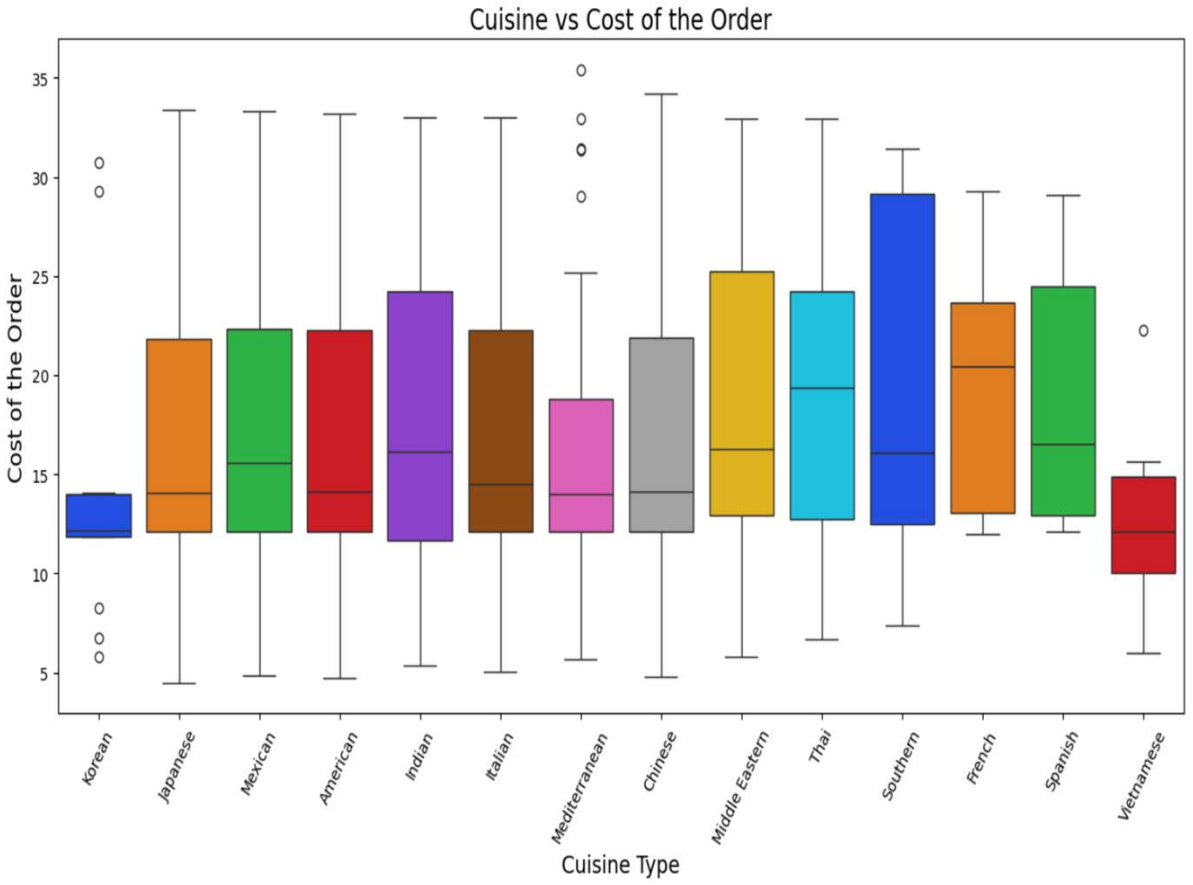
Observations:

- The average delivery time is slightly lower than the median, suggesting the distribution is mildly left-skewed.
- A larger proportion of orders have delivery times between 24 and 30 minutes.
- No outliers are present in this data

Multivariate Analysis

Observations:

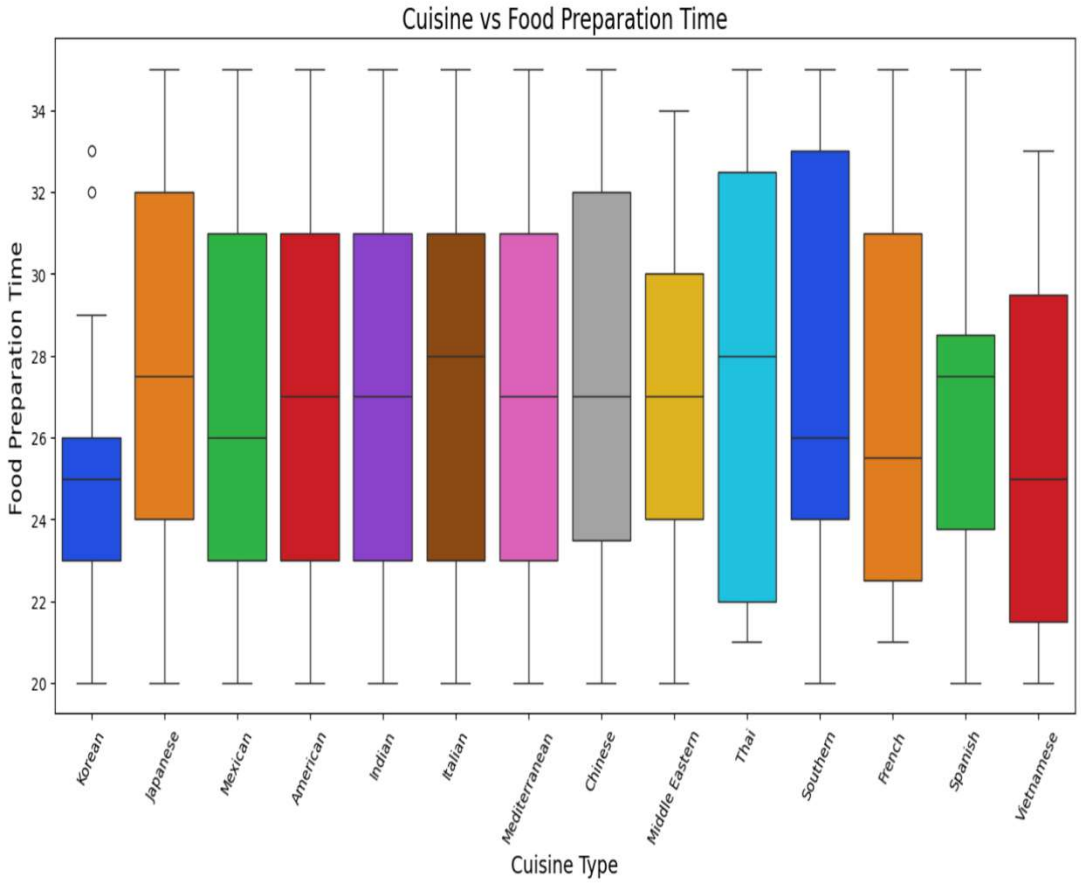
- Vietnamese and Korean cuisines are generally more affordable compared to others.
- The boxplots for Italian, American, Chinese, and Japanese cuisines show similar patterns, indicating that their quartile costs are comparable.
- Outliers are observed in the cost data for Korean, Mediterranean, and Vietnamese cuisines.
- French and Spanish cuisines tend to be more expensive than the rest



Multivariate Analysis

Observation:

- The type of cuisine that requires more prep time on average is Italian and Thai Cuisine
- The type of cuisine that requires less prep time on average is Korean, Southern, and Vietnamese Cuisine.
- Overall the variability in food preparation time across cuisines is similar, meaning that on average all the cuisines require around the same amount of time with a few variations.
- Food preparation times exhibit high consistency across most cuisines.
- The median preparation time for all cuisines ranges between 24 and 30 minutes.
- Notable outliers are observed in the preparation times for Korean cuisine. Korean cuisine demonstrates shorter preparation times compared to other cuisines

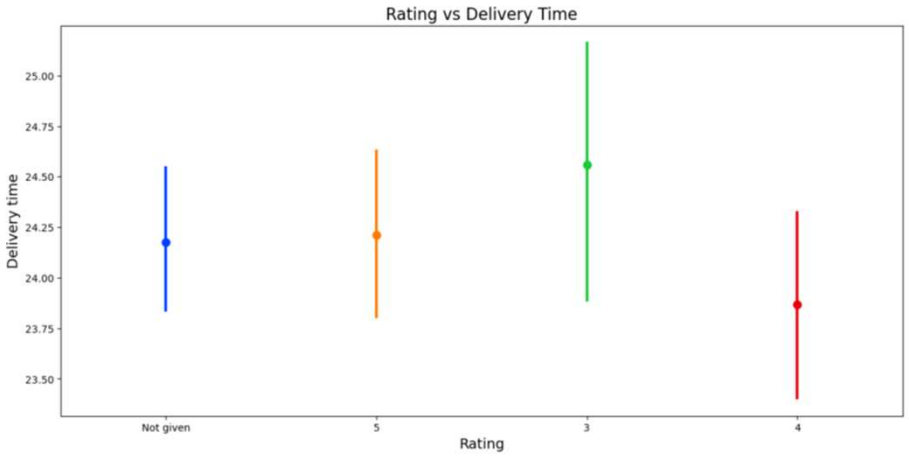


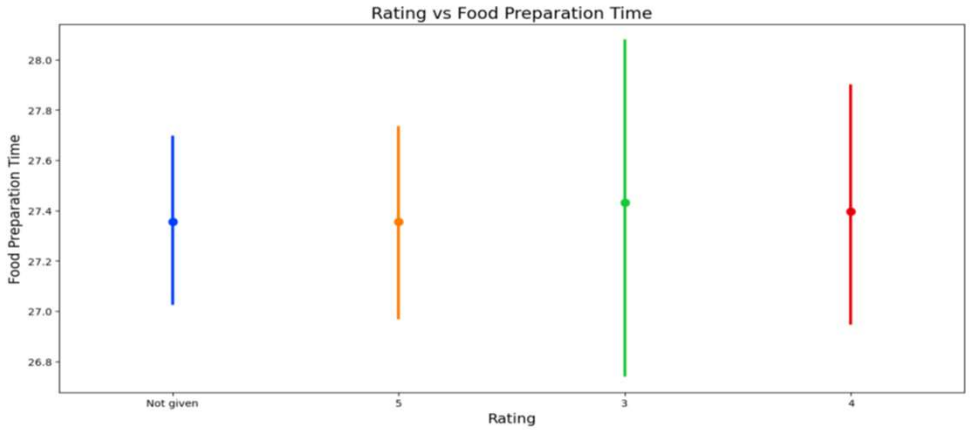
Multivariate Analysis

Observations:

- There are 1,351 orders placed on weekends, compared to only 547 during weekdays.
- Weekend orders account for 71.18% of the total, while weekday orders constitute 28.8%

Multivariate Analysis





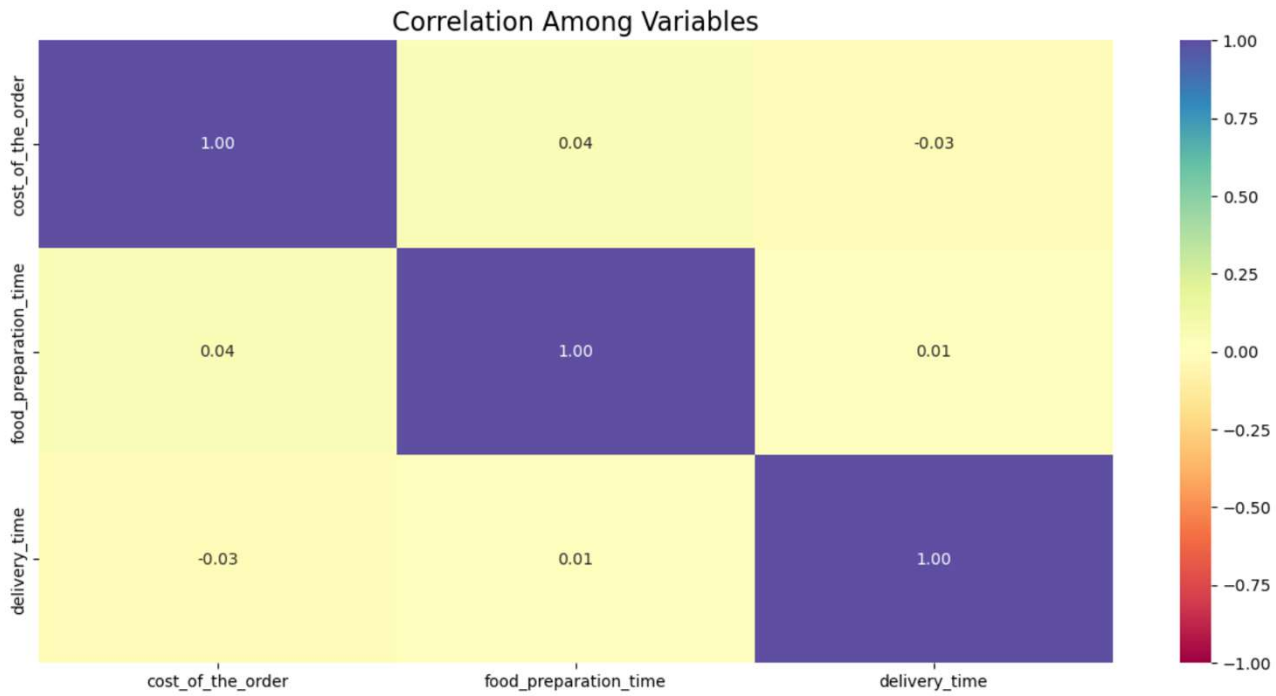
Observation:

- The pointplot shows the average of each rating value along with its confidence interval. We can see that the delivery time and total time tends to affect the rating more when it is higher as it has a tendency to be 3.
- However, if the time to delivery is less than 25 minutes consumers will put 5 and 4 rating not relating it to the delivery time. So maybe other factors such as the food quality might have impacted that decision.

Multivariate Analysis

Observations:

- There is no correlation between the cost of the order, delivery time, and food preparation time



APPENDIX

Conclusions:

- Delivery Times: Delivery times show a noticeable variation between weekdays and weekends, potentially influenced by factors such as traffic conditions, restaurant workload, staffing levels, or fluctuations in order volume.

- Customer Ratings and Cuisines: Certain cuisines tend to receive higher average ratings, reflecting customer preferences for specific types of food. Restaurants with strong ratings and ample customer feedback are ideal candidates for targeted promotional campaigns.

- Order Efficiency: In some cases, the total time from order placement to delivery exceeds 60 minutes, which could negatively affect customer satisfaction. Efforts should be made to minimize these delays.

Recommendations:

To enhance customer satisfaction and operational efficiency, FoodHub should consider the following recommendations:

- Redesign FoodHub's Ecommerce: Hire a marketing team to rebrand, logo, moto, website, app, as rebranding will align all marketing material to draw customers.
- Expand Restaurant Partnerships: Collaborate with restaurants offering American, Japanese, Italian, and Chinese cuisines, as these are highly popular among FoodHub customers.
- Promotional Strategies: Provide exclusive promotional offers to top-rated, high-demand restaurants, such as Shake Shack, which handle a significant share of orders.

Recommendations:

- Weekend Operations Optimization: Increase the number of delivery personnel during weekends to manage the higher order volume effectively and ensure timely deliveries. Introduce weekend-specific promotional offers to further boost customer orders during this period.

- Encourage Customer Ratings: Since customer ratings are crucial for gauging satisfaction, FoodHub should address the low rating submission rate. Revamp the app's rating interface to make it more engaging and user-friendly, encouraging customers to leave feedback.

- Reduce Long Delivery Times: Approximately 11% of orders have a delivery time exceeding 60 minutes, which risks customer dissatisfaction. Implement measures to minimize such delays, such as offering rewards to delivery personnel who consistently meet punctuality standards.

Great Learning

Happy Learning !