Boosting Delivery Revenue with Attractive Discounts

Food Hub Data Analysis

Foundations of AI

14 October 2025

Prepared by Daniel J. Holloman

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Executive Summary

Conclusions:

- Median delivery time is acceptable at 25 minutes.
- More orders occur on weekdays, but there are 5 weekdays and only 2 weekend days per week. This skews the data, with more total deliveries occurring on weekdays.
- Ratings are negatively correlated with food prep time.
- Higher cost per order is positively correlated with ratings.
- Rating trends indicate customer psychology associates higher cost with higher quality.
- Delivery time is negatively correlated with cost of the order.
- As the cost of the order increases, so does revenue.
- Cost of the order does not seem to have much impact on the rating of the company. This indicates that customers give ratings independent of order cost.
- Korean, Vietnamese, and Mediterranean cuisine are among the least popular cuisines, which may be why they contain outliers.

Insights:

- When cost is above $5, the 15% discount is applied. When cost is above $20, the 25% discount is applied. The profit margin, therefore, decreases again.
- Discounts appear to increase the average order cost, as customers are eager to get a bargain.

Recommendations:

- Customer experience can be improved by frequent promotions, encouraging customers to order.
- Surcharge fee should be raised. Customers seem to rate orders independent of the total order cost
- Outliers should be considered as non-essential to this analysis.
- Customers can be persuaded to spend more by adding a new discount tier.
- Orders above $35 will receive a 30% discount.
- Ratings that are “Not given” should be converted to nulls to avoid improper imputation.

Business Problem Overview and Solution Approach

Problems:

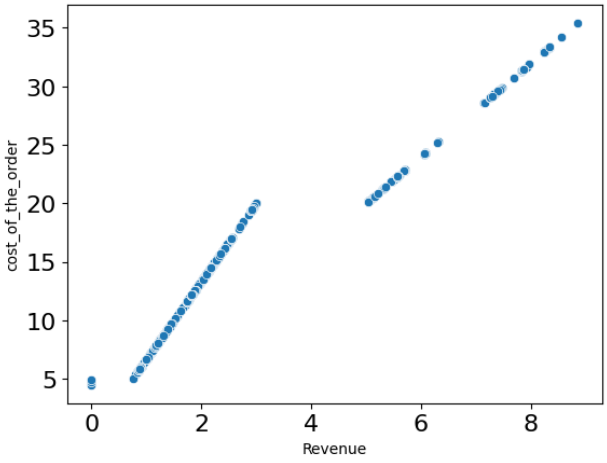
- Executives from New York food aggregator app, FoodHub want to better understand which types of restaurants have the highest demand. The number of restaurants in New York increases daily, therefore, the market size increases daily.
- The company and its shareholders want to earn more revenue to grow and gain market share. FoodHub seeks to capture this market trend and embed itself as a major player in the food aggregator industry.
- FoodHub seeks to understand customer preferences to develop a more diverse product offering.

Solutions:

- Create a new discount tier to inspire customers to spend more per order. Although discounts make for smaller profit, the average cost of the order will increase by inspiring customers to spend more.
- Delivery fees and surcharges can be increased, with little pushback from customers.
- Incentivize customers with promotions to try less popular cuisines, creating a broader product/service mix.
- Capture the market by acquiring new customers through discounts and promotions and then raise prices.

Data Overview

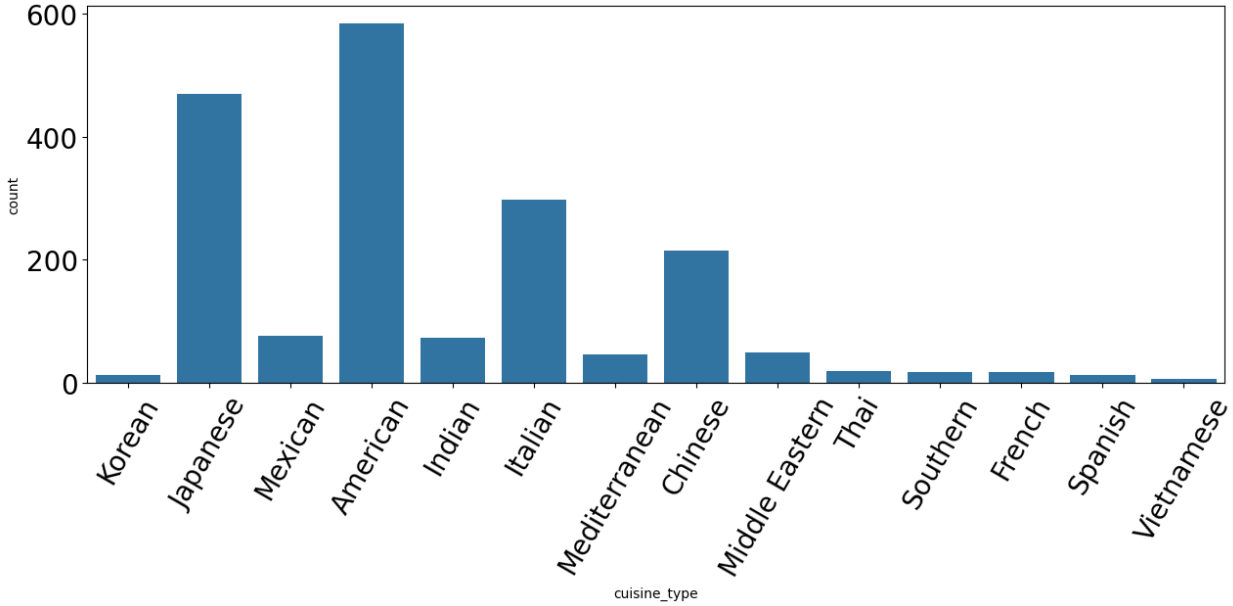
- Univariate data displays information about single variables by using count plots, histograms, and box plots
- Multivariate data compares two or more variables to determine distributions and trends.
- 39% of FoodHub's orders were not rated by the customer. This led to gaps in data which must be handled with care. The way missing data is handled varies on a case-by-case basis. To clean the data for FoodHub, many missing values with object labels, were converted to null values, and rating strings were converted to integers. This approach avoids biased imputation of missing data, improving the quality of the data.
- Data Shape: 1898 rows and 9 columns.
- 4 Integers: Order ID, Customer ID, Food Preparation Time, and Delivery Time.
- 4 Objects: Restaurant Name, Cuisine Type, Day of the Week, and Rating
- 1 Float: Cost of the Order
- 736 missing values were labeled, 'Not given'. These missing values were converted to null values ("NaN") for a cleaner dataset.
- Food preparation time:
    - Minimum—20 minutes
    - Average—27.37 minutes
    - Maximum—35 minutes
- Total unrated orders: 736



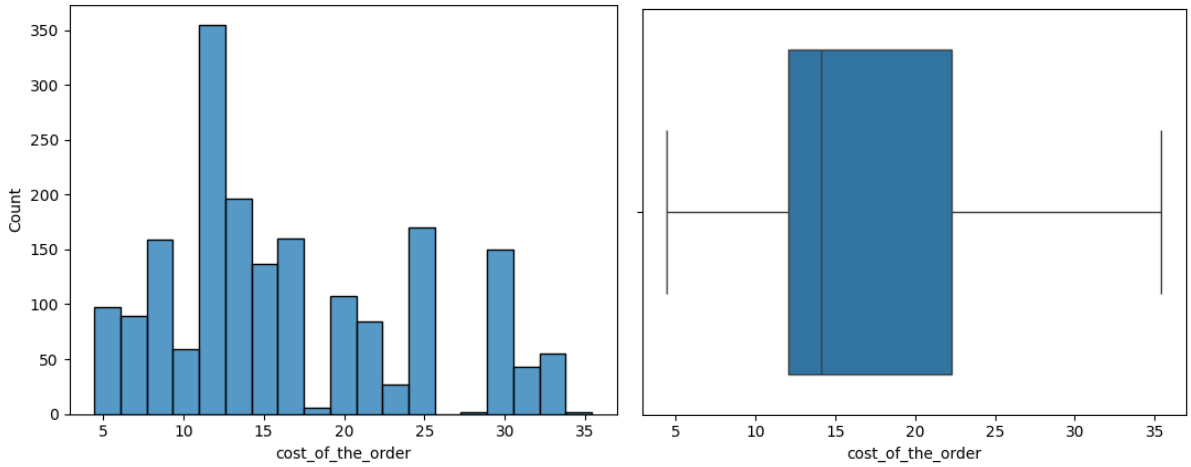
Order cost and revenue are positively correlated, and their distribution reveals clusters, based on discount tiers.

Univariate Analysis

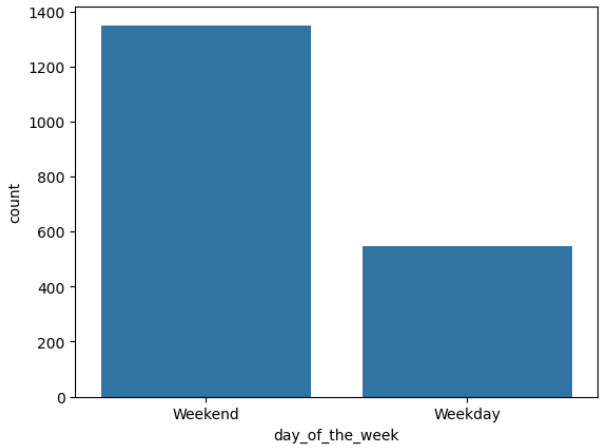
Cuisine Popularity

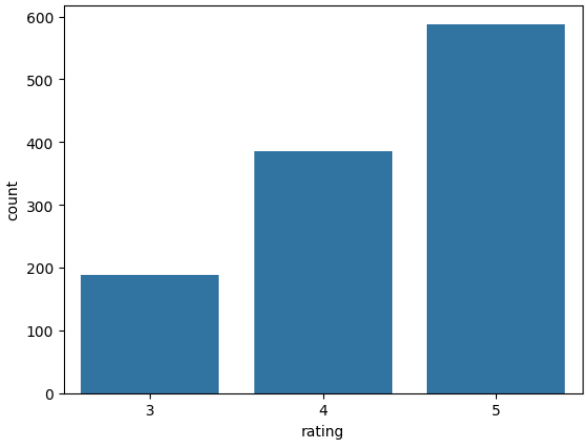


Counts of Cost Per Order

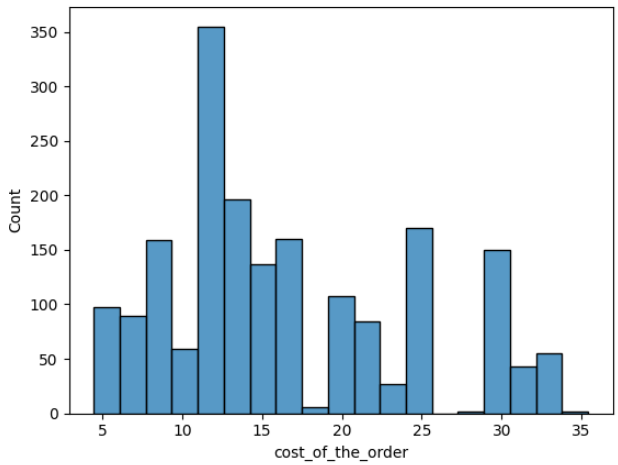


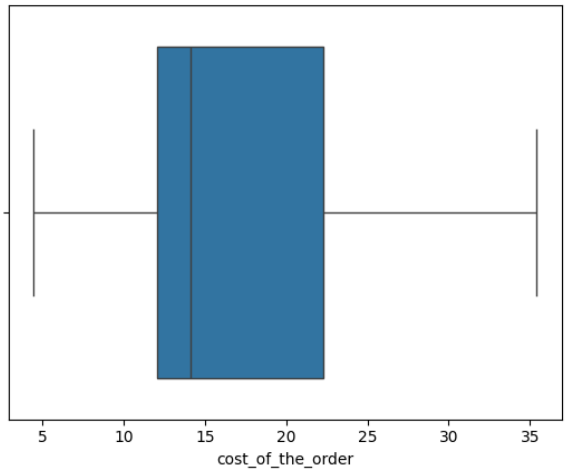
Counts of Day of the Week and Rating



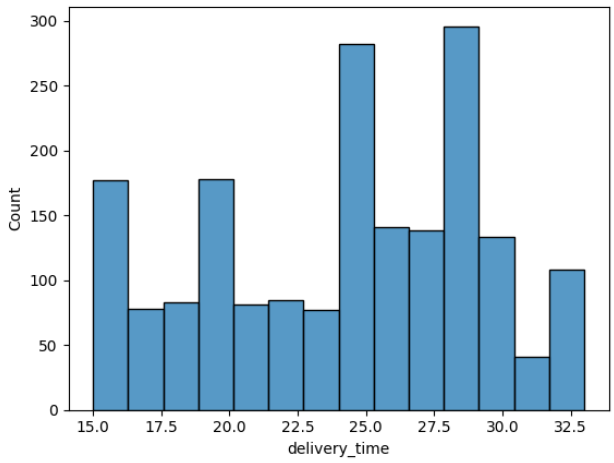


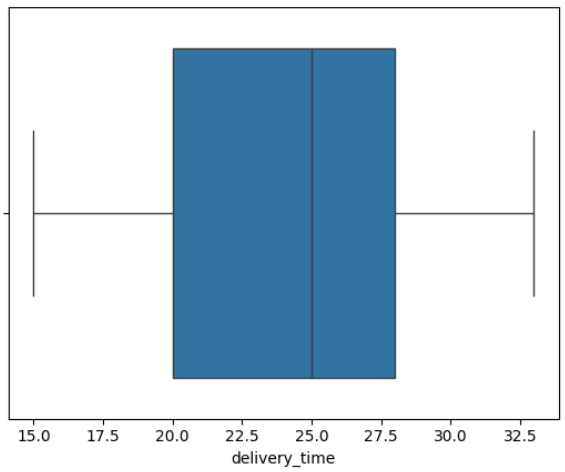
Counts of the Cost of the Order





Counts of Delivery Times





Top 5 Restaurants	No. of Orders
Shake Shack	219
The Meatball Shop	132
Blue Ribbon Sushi	119
Blue Ribbon Fried Chicken	96
Parm	68

Customer ID	No. of Orders
52832	13
47440	10
83287	9

Most Popular Weekend Cuisines	No. of Orders
American	415
Japanese	335
Italian	207
Chinese	163
Mexican	53
Indian	49
Middle Eastern	32
Mediterranean	32
Thai	15
French	13
Korean	11
Southern	11
Spanish	11
Vietnamese	4

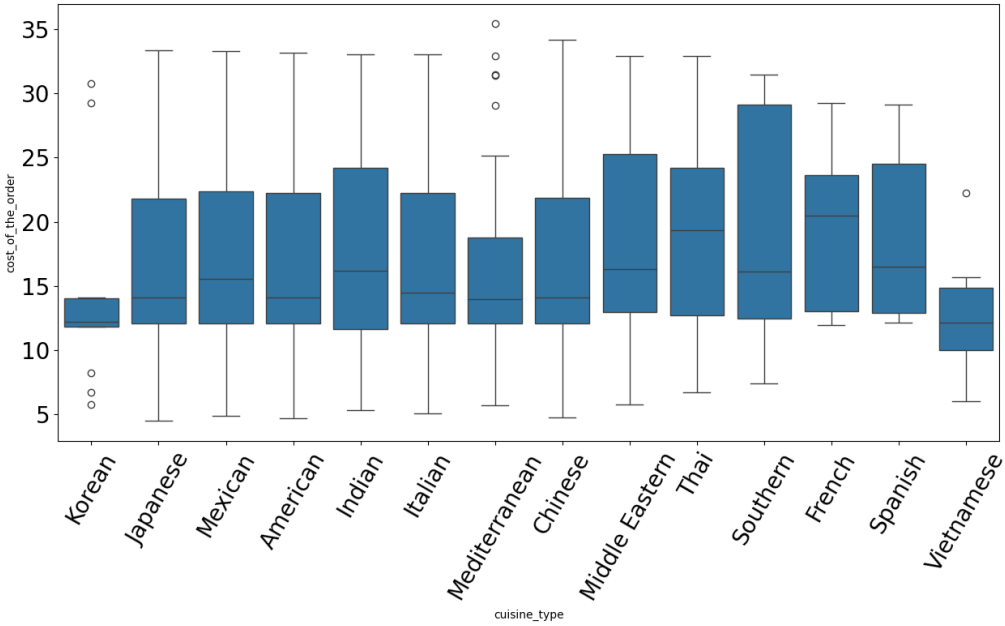
555 of all orders were above $20

29.24% of orders were above $20

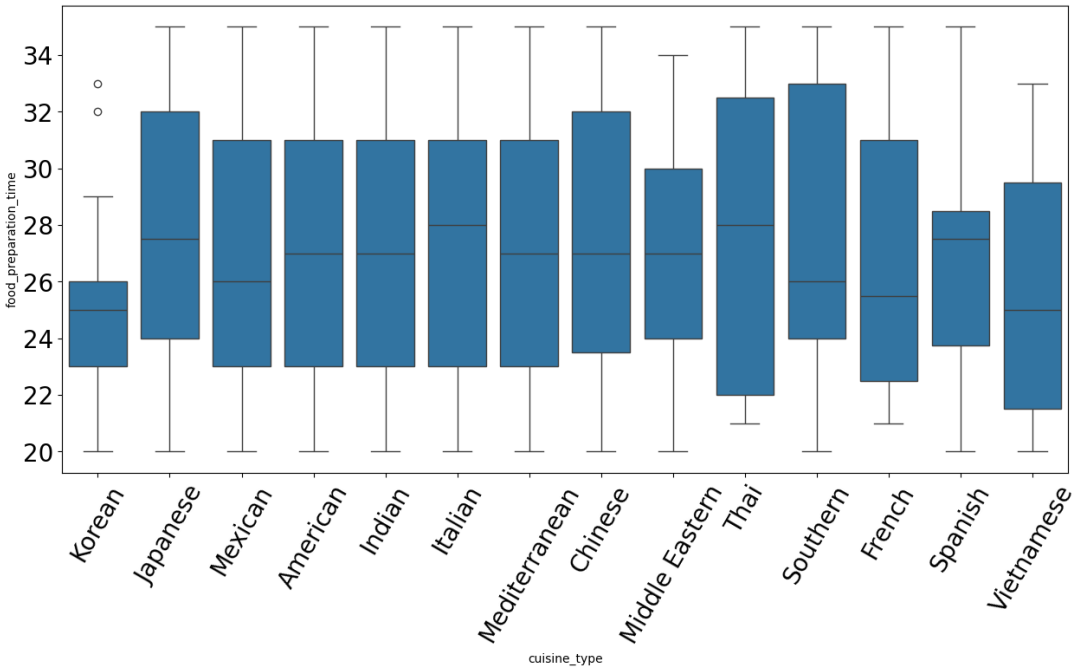
Mean delivery time was 24.16 minutes

Multivariate Analysis

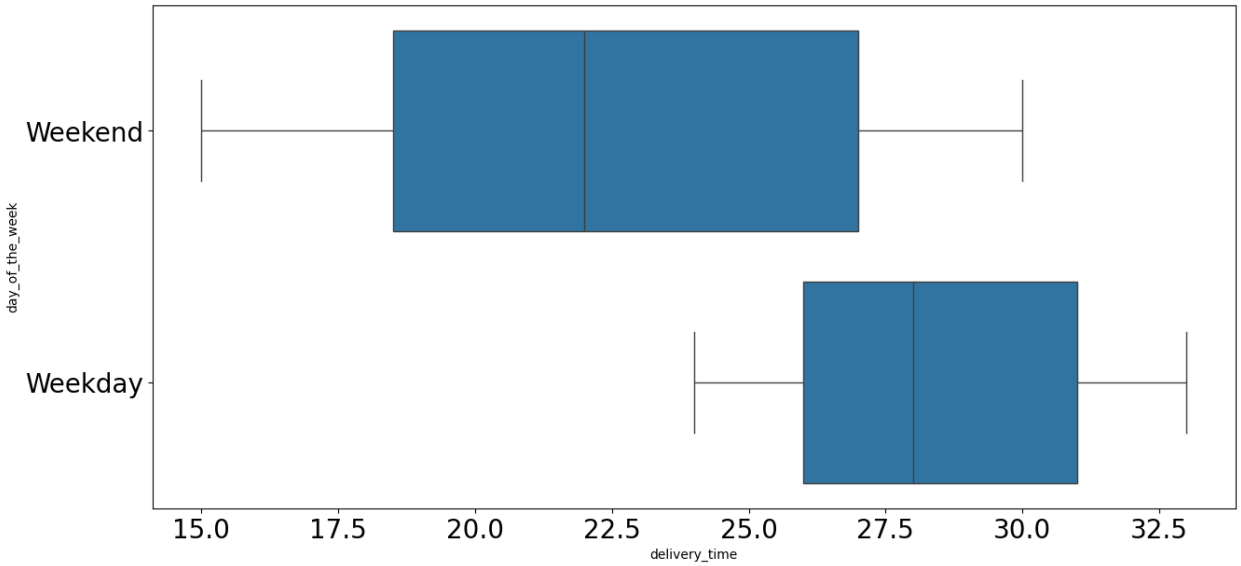
Order Cost vs. Cuisine Type



Food Preparation Time vs. Cuisine Type



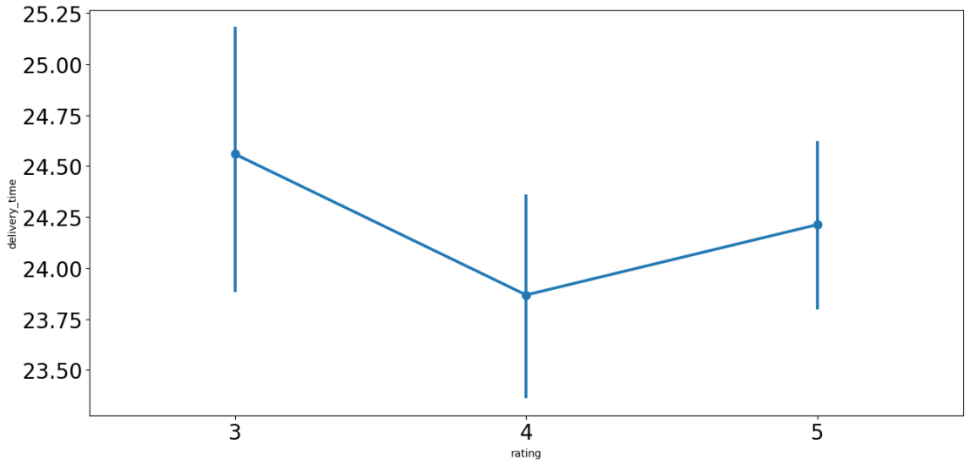
Delivery Time by Days of the Week



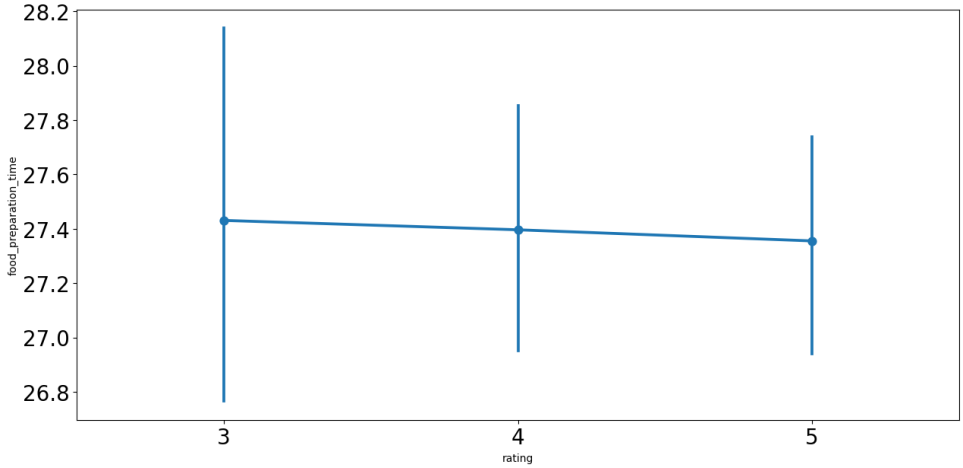
Top revenue restaurants are listed below. Shake Shack is the top revenue generator, followed by The Meatball Shop, and then Blue Ribbon Sushi. There is another restaurant called “Blue Ribbon Sushi Bar & Grill”, which has a high revenue, by business law ruling appears to be a completely unique company with a unique doing-business-as name (DBA name).

Restaurant	Total Revenue Sums
Shake Shack	3579.53
The Meatball Shop	2145.21
Blue Ribbon Sushi	1903.95
Blue Ribbon Fried Chicken	1662.29
Parm	1112.76
RedFarm Broadway	965.13
RedFarm Hudson	921.21
TAO	834.50
Han Dynasty	755.29
Blue Ribbon Sushi Bar & Grill	666.62
Rubirosa	660.45
Sushi of Gari 46	640.87
Nobu Next Door	623.67
Five Guys Burgers and Fries	506.47

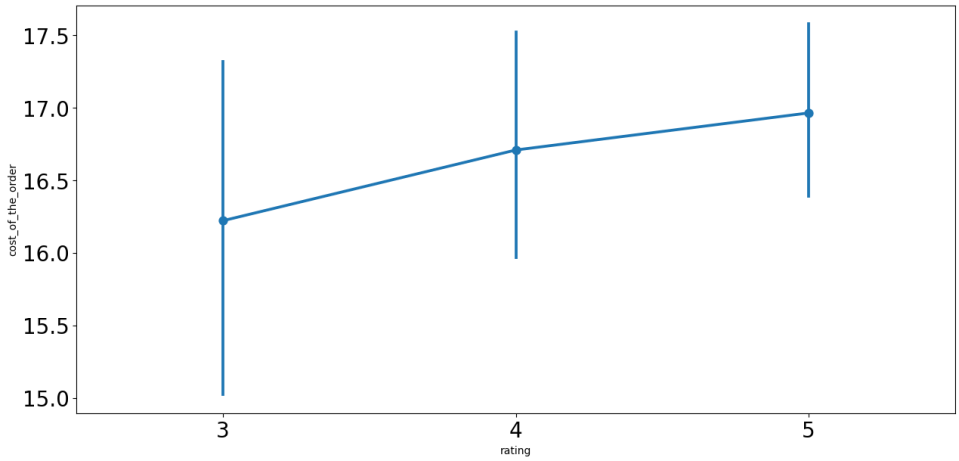
Delivery Time vs. Rating



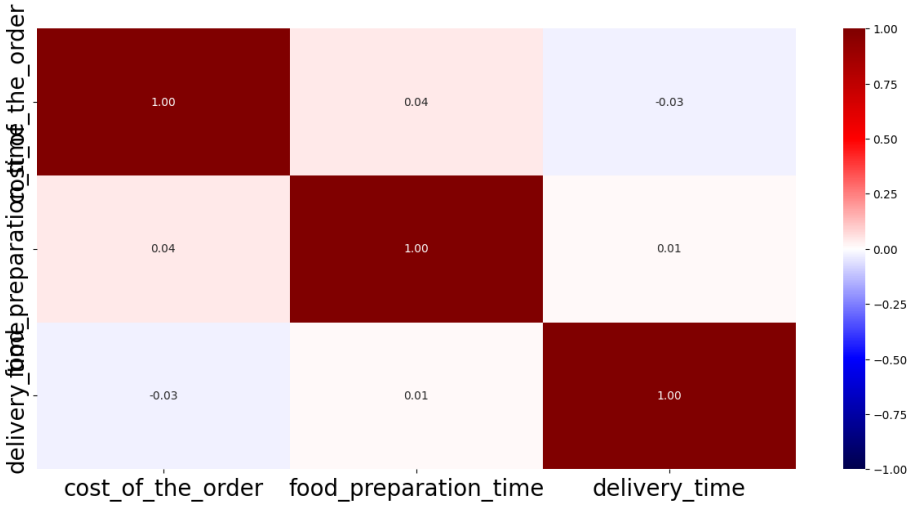
Food Preparation Time vs. Rating



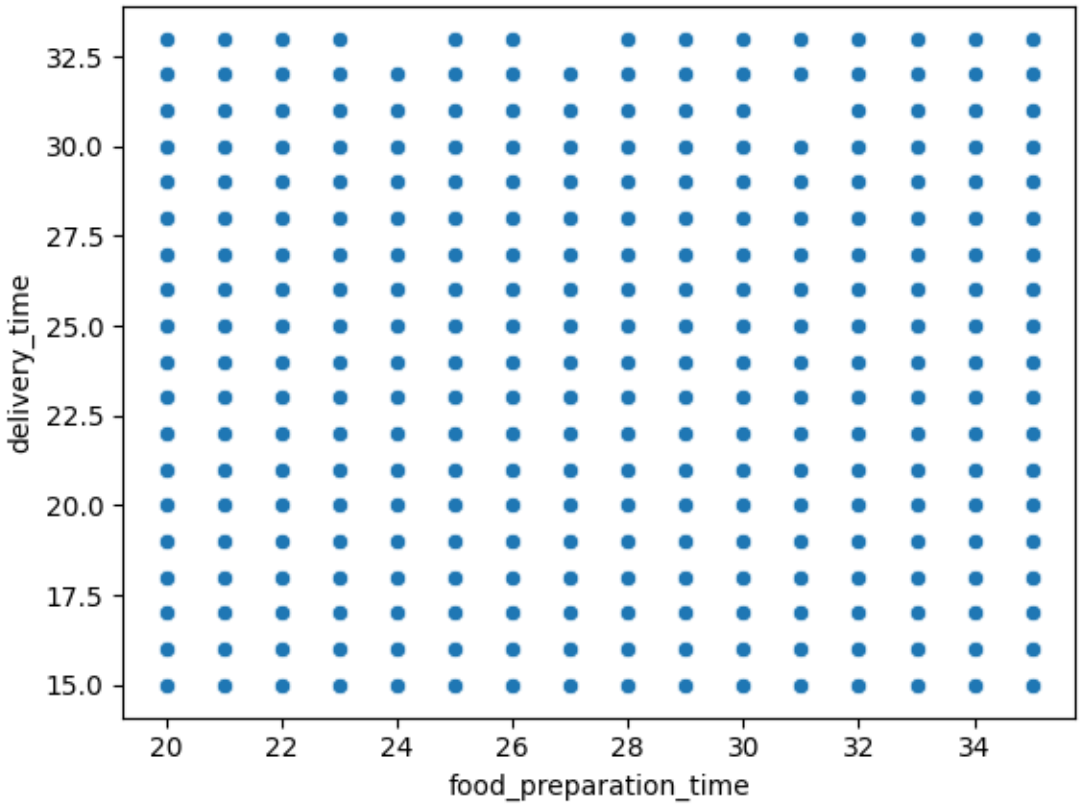
Cost of the Order vs. Rating



Delivery Time is negatively correlated with Cost of the Order.



Food Preparation Time and Delivery Time are uniformly distributed when compared on a scatterplot, suggesting they have no correlation.



Restaurant	No. of Ratings
Shake Shack	133
The Meatball Shop	84
Blue Ribbon Sushi	73
Blue Ribbon Fried Chicken	64

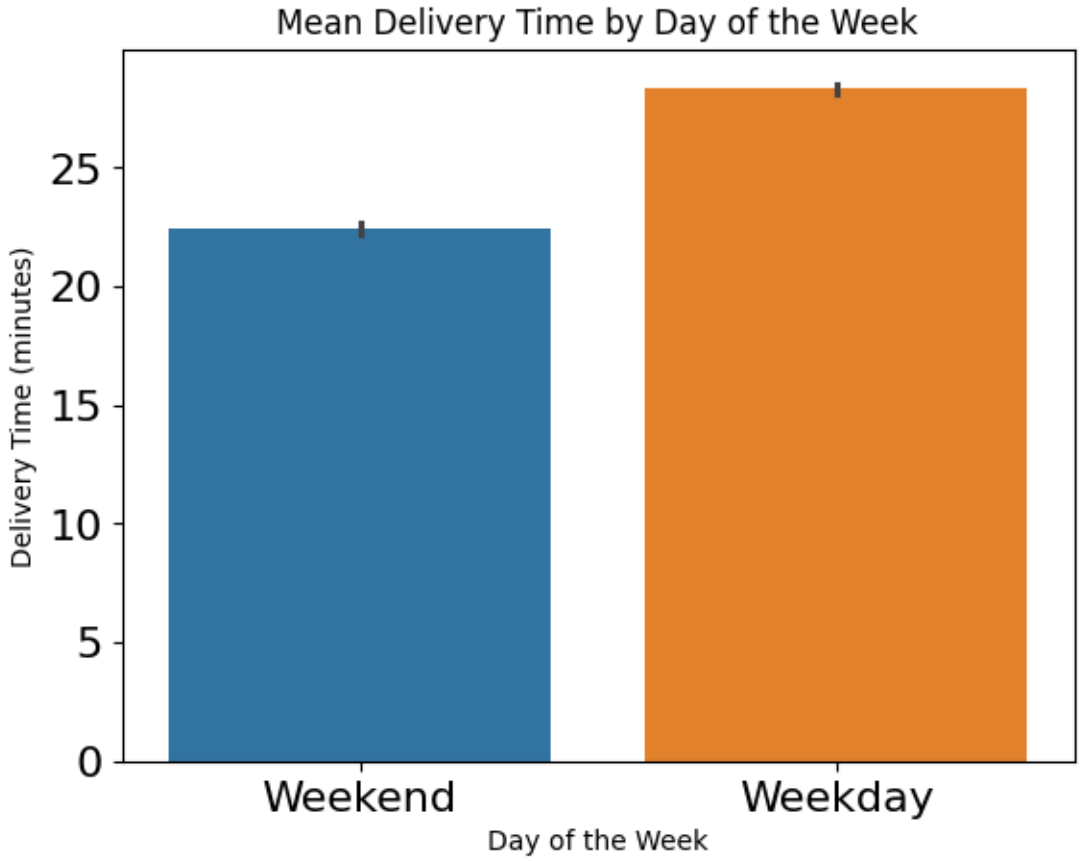
Restaurant	Mean Rating
The Meatball Shop	4.511905
Blue Ribbon Fried Chicken	4.328125
Shake Shack	4.278195
Blue Ribbon Sushi	4.219178

Key Datapoints:

- Total Revenue = $6166.30
- The number of total order deliveries more than 60 minutes: 200
- Percentage of order deliveries more than 60 minutes: 10.54 %

Mean delivery time (weekdays): 28 minutes

Mean delivery time (weekend): 22 minutes



Conclusions and Recommendations

- **Conclusion 1: Market Growth**

  As the number of restaurants in New York rapidly increases, so do the business opportunities for Food Hub.

- **Recommendation 1: New Business Strategies**

  FoodHub can strategically position itself to capture more market share in New York, as new restaurants open through the city. This can be achieved through promotions, discounts, and incentives for new and existing customers.

- **Conclusion 2: Lower Profits Can Increase Revenue**

  The current discounts dilute profit margins for orders over $20. But there are many customers who would already spend more than $20. This is a relatively small sum of money for a customer to spend on food delivery. The average order costs $16.50, with a standard deviation of $7.48.

- **Recommendation 2: New discount tier**

  The maximum cost per order is $35.41. My recommendation is to create a new discount tier. Customers who spend more than $35 will thereafter earn a 30% discount. Customers will be inspired to spend more, thereby raising the mean cost of all orders.

- **Conclusion 3: Customer Preferences**

  American food is the most popular cuisine, followed by Japanese, Italian, and Chinese. Other cuisine types are less popular.

- **Recommendation 3: Daily Promotions**

  FoodHub should advertise a promotion encouraging customers to buy less popular cuisines such as Korean food, and Vietnamese food. They can spread these promotions throughout different days of the week to improve sales on days which are typically associated with lower sales.

- **Conclusion 4: Missing values**

  The dataset has many missing values in the rating column. This makes it more challenging to work with the data. In a perfect world, every order would get a rating.

- **Recommendation 4: Discounts for Ratings**

  FoodHub should offer an additional 5% off, if you rate the restaurant, leading to more complete data, and more orders.