

Enhancing Customer Experience: Analyzing Demand FoodHub

Foundations of Data Science

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Executive Summary

Key Findings:

- **Customer Ratings:** There is a positive correlation between faster food preparation and delivery times with higher customer satisfaction ratings.
- **Delivery Time:** Delivery times are slower on weekends compared to weekdays, presenting an opportunity to improve logistics and reduce discrepancies.
- **Order Value:** A significant portion of revenue comes from orders over \$20, creating opportunities for targeted promotions and pricing strategies.
- **Cuisine Popularity:** Certain cuisine types and restaurants, particularly Italian cuisine on weekends, show higher popularity, which can inform marketing and resource allocation.
- **Low Ratings:** Some restaurants and cuisine types consistently receive lower ratings, highlighting the need for focused operational improvements.

Recommendations:

1. Marketing and Promotions:

- **Weekend Promotions:** Target promotions for popular Italian cuisine on weekends to boost sales.
- **High-Value Orders:** Implement promotions for orders exceeding \$20 to capitalize on revenue potential.
- **Restaurant Partnerships:** Promote and partner with restaurants like Shake Shack, Siam Square, and The Halal Guys to drive customer engagement.

2. Operations and Logistics:

- **Reduce Delivery Times:** Optimize delivery routes and driver availability, especially during peak hours and weekends, to improve customer satisfaction.

- **Resolve Delivery Discrepancies:** Investigate and address slower weekend delivery times by increasing drivers or re-structuring delivery zones.
- **Improve Low-Rating Restaurants:** Partner with underperforming restaurants to enhance operations through training, menu changes, and quality improvements.
- **Food Preparation Time:** Collaborate with restaurants to reduce preparation times through workflow improvements and incentive programs.

3. Customer Experience:

- **Tailored Recommendations:** Use customer data to provide personalized recommendations and encourage repeat orders.
- **Reward Programs:** Implement rewards for loyal, high-usage customers to enhance retention.
- **Surveys and Ratings:** Encourage more customers to provide ratings and complete satisfaction surveys through targeted incentives, improving overall service feedback and data collection.

These strategies aim to improve operational efficiency, enhance customer satisfaction, and increase revenue opportunities for FoodHub.

Business Problem Overview and Solution Approach

FoodHub is an online app service that provides restaurant food delivery to its customers in NYC. FoodHub is experiencing challenges with meeting the demand of its customer base and optimizing operations. By analyzing the data the following challenges and goals have been developed.

Key Challenges:

1. Delivery Times
2. Weekdays vs Weekends
3. Restaurant Performance
4. Marketing
5. Customer Preferences
6. Efficiency of Operations

Goals:

1. Reduce delivery times to improve customer ratings and satisfaction.
2. Increase revenue by improving marketing, strategic promotions and gaining new customers.
3. Improve operations by optimizing delivery routes, partnering with restaurants and streamlining processes.
4. Increase understanding of customer preferences and tailor customer recommendations and services.

Data Overview

The data set provided by FoodHub has the following categories:

- Order ID
- Customer ID
- Restaurant Name
- Cuisine Type
- Cost of the Order
- Day of the Week (Weekend or Weekday)
- Rating
- Food Preparation Time
- Delivery Time

There are 9 total columns.

Data Types of Columns

Order Id	Customer Id	Restaurant Name	Cuisine Type	Cost of the Order	Day of the Week	Rating	Food Prep. Time	Delivery Time
integer	integer	object	object	Float	Object	Object	Float	Float

Summary of Data

	order_id	customer_id	cost_of_the_order	food_preparation_time	delivery_time
count	1.898000e+03	1898.000000	1898.000000	1898.000000	1898.000000
mean	1.477496e+06	171168.478398	16.498851	27.371970	24.161749
std	5.480497e+02	113698.139743	7.483812	4.632481	4.972637
min	1.476547e+06	1311.000000	4.470000	20.000000	15.000000
25%	1.477021e+06	77787.750000	12.080000	23.000000	20.000000
50%	1.477496e+06	128600.000000	14.140000	27.000000	25.000000
75%	1.477970e+06	270525.000000	22.297500	31.000000	28.000000
max	1.478444e+06	405334.000000	35.410000	35.000000	33.000000

There is no missing data.

Univariate Analysis

- **Order ID**

There are a total of 1,898 orders.

- **Customer ID**

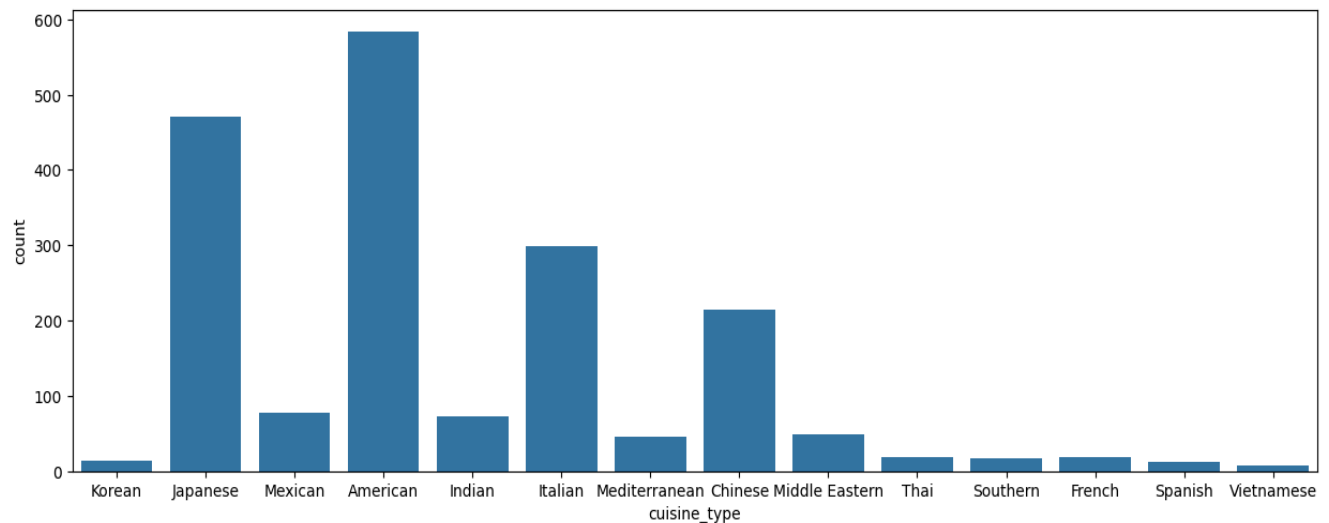
There are 1,200 unique customer ids.

- **Restaurant Name**

There are a total of 178 individual restaurants.

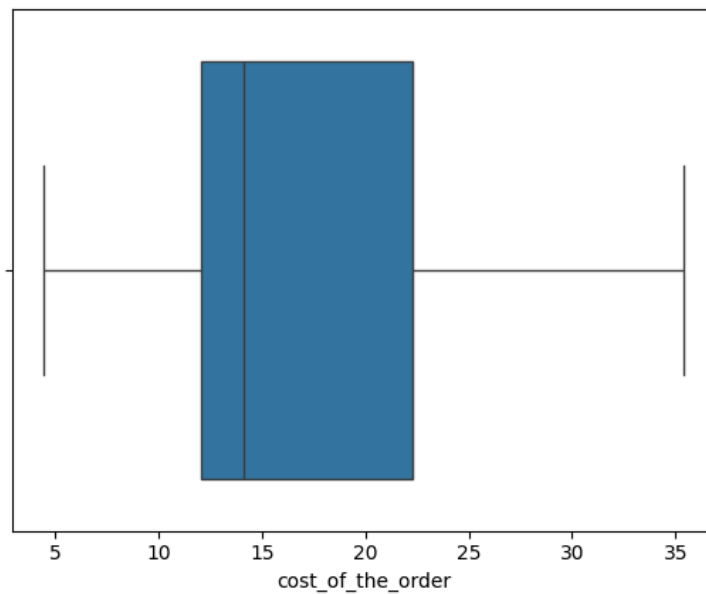
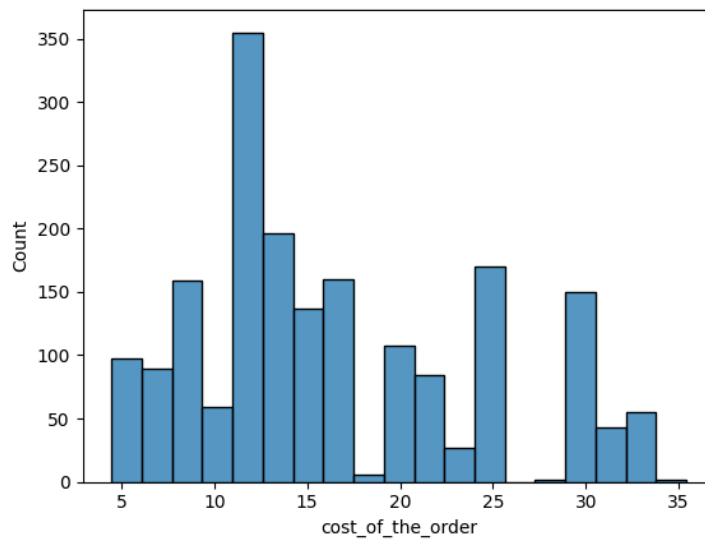
- **Cuisine Type**

There are 14 unique cuisine types.



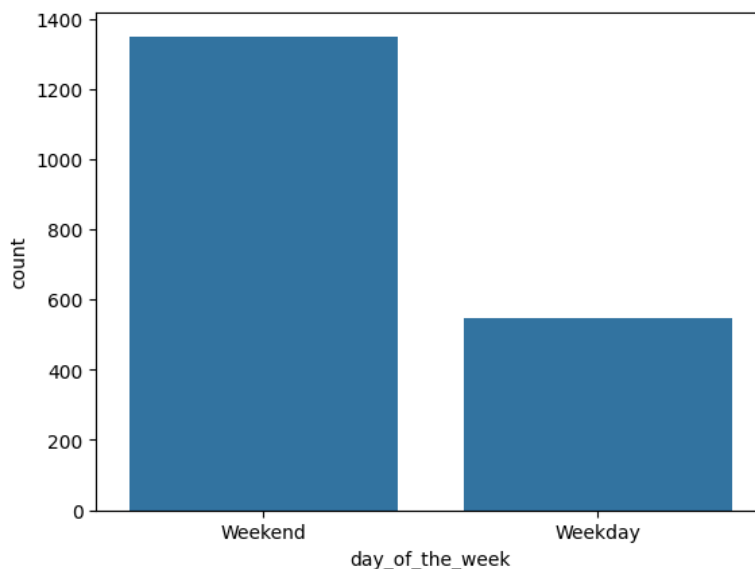
Observation: The most popular cuisines are American, Japanese, Italian, and Chinese cuisine. Ten categories have significantly less orders.

- **Cost of the Order**



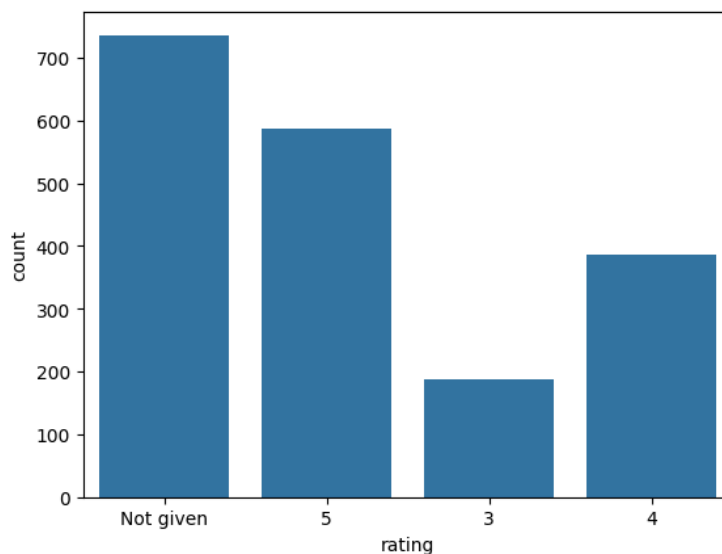
Observation: The distribution of cost is largest between 12 and 22 dollars. The overall range is 5 dollars to 35 dollars.

- Day of the Week (Weekend or Weekday)



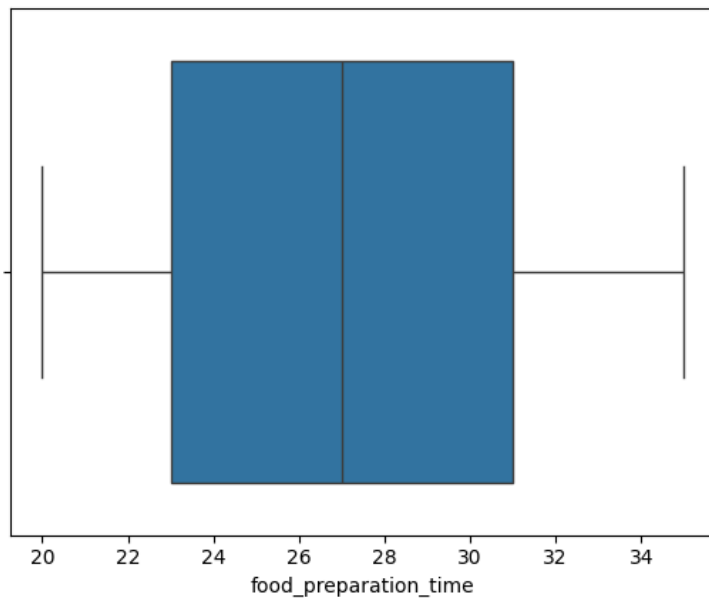
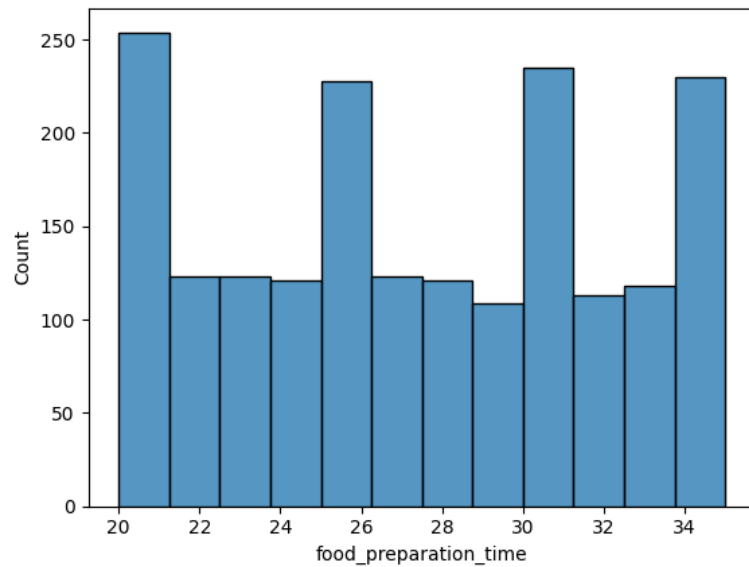
Rating (4 objects)

Not given	736
5	588
4	386
3	188



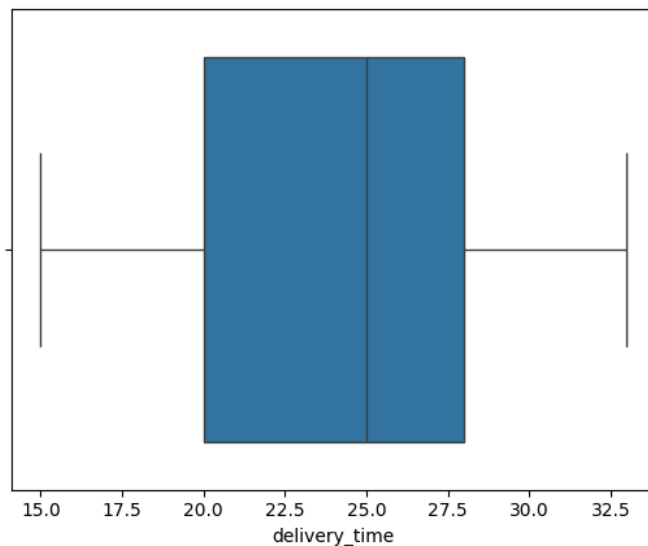
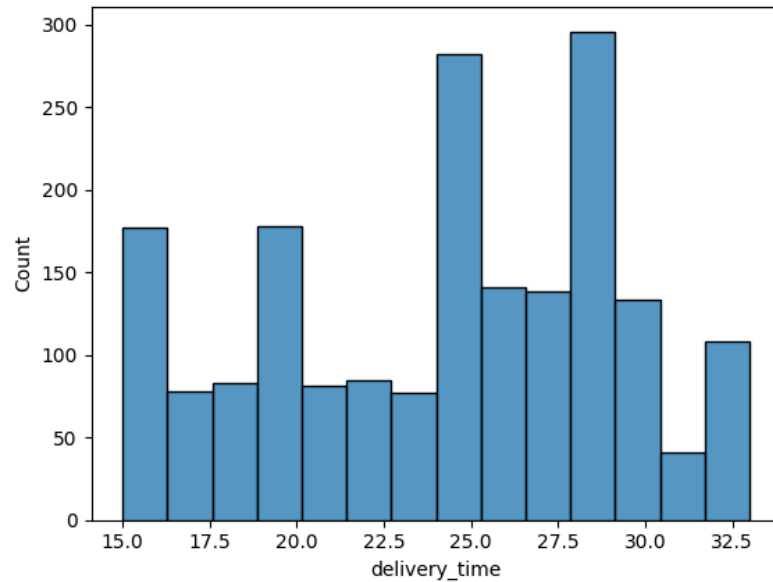
Observations: There is a significant number of customers who have not provided a rating. This is the largest category among the ratings by far. There are about double the delivery orders on the weekends compared to weekdays. Positive reviews are high overall, the lowest rating has the lowest count. It would be worth investigating the ratings not given.

- Food Preparation Time



Observations: Food is prepared within a range of 20 to 35 minutes. The mean is approximately 27 minutes. The overall preparation time is more than delivery time.

- **Delivery Time**



Observations: Delivery time ranges from approximately 15 to 33 minutes. The average delivery time is approximately 25 minutes. The distribution is concentrated within approximately 20 to 28 minutes. The overall delivery time is less than the food preparation time.

- The Top 5 Restaurants with the most orders

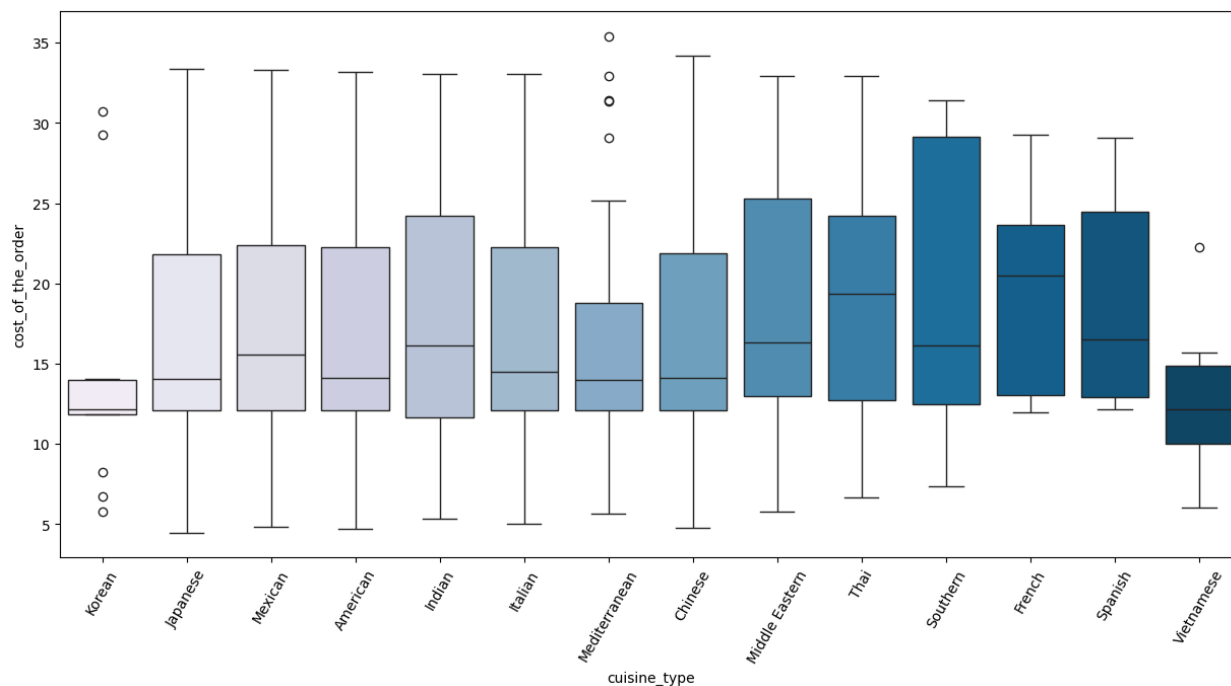
Shake Shack	219
The Meatball Shop	132
Blue Ribbon Sushi	119
Blue Ribbon Fried Chicken	96
Parm	68

- The number of total orders that cost above 20 dollars is 555, which is 29.24%.
- The mean delivery time is 24.16 minutes.
- The following customers is a list of top three customers with the most frequent orders who qualify for Foodhubs' 20% discount voucher.

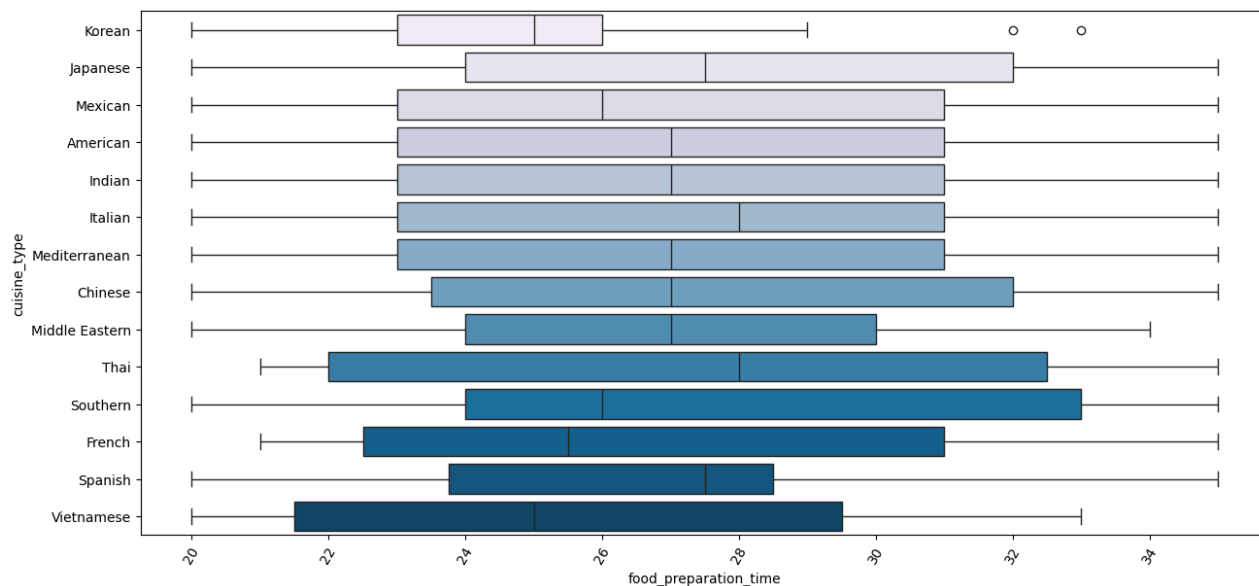
customer_id	
52832	13
47440	10
83287	9

Multivariate Analysis

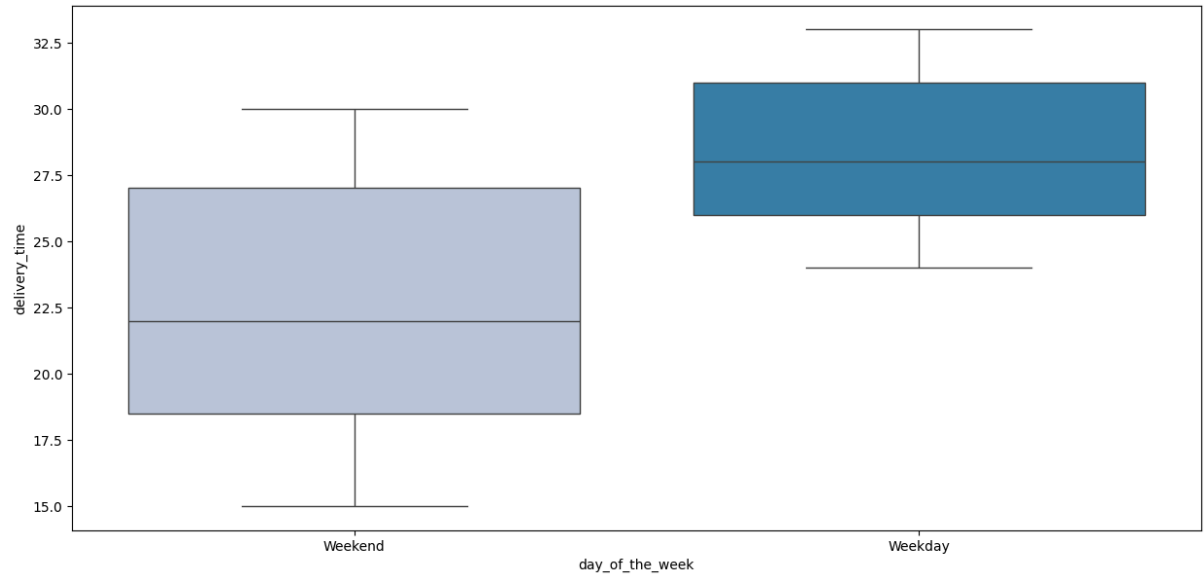
- Cuisine vs. Cost of the Order



- Cuisine vs Food Preparation Time



- Day of the Week vs Delivery Time

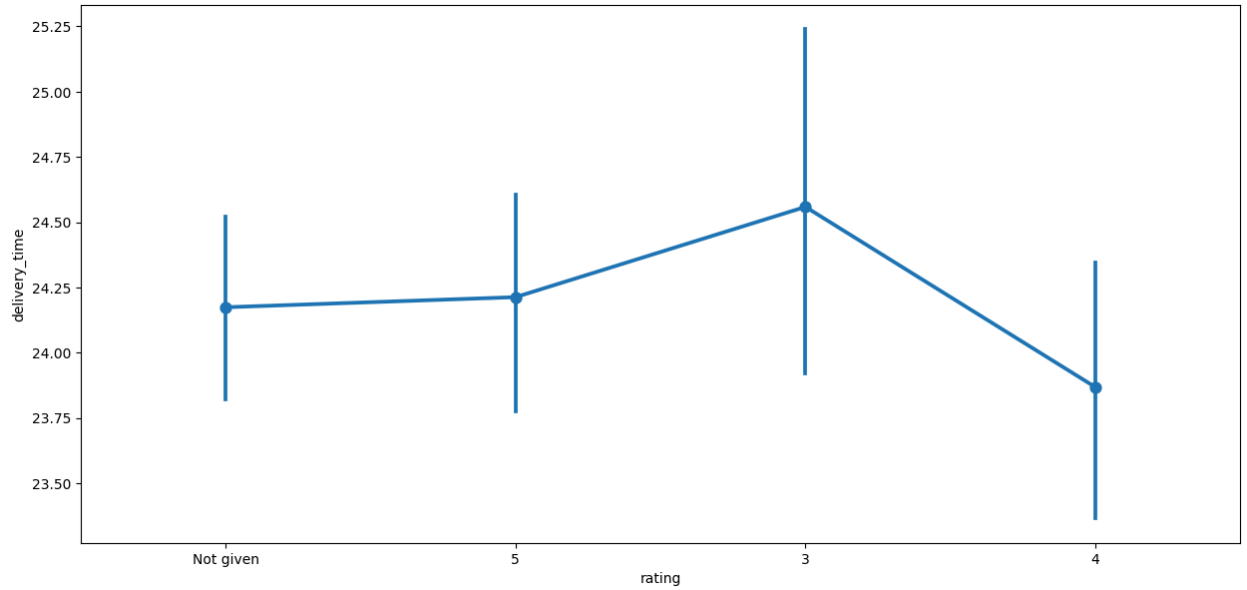


Top 14 Highest Revenue by Restaurant

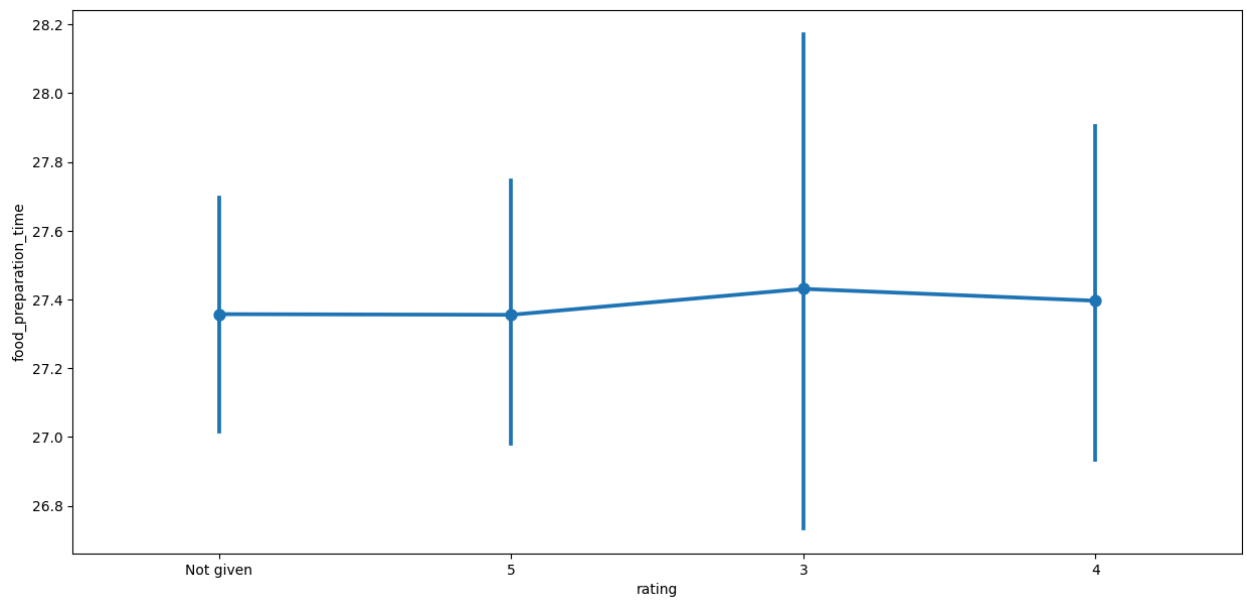
restaurant_name	
Shake Shack	3579.53
The Meatball Shop	2145.21
Blue Ribbon Sushi	1903.95
Blue Ribbon Fried Chicken	1662.29
Parm	1112.76
RedFarm Broadway	965.13
RedFarm Hudson	921.21
TAO	834.50
Han Dynasty	755.29
Blue Ribbon Sushi Bar & Grill	666.62
Rubirosa	660.45
Sushi of Gari 46	640.87
Nobu Next Door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

Observations: “Shake Shack” is the clear leader with almost 7 times the profit of “Five Guys Burgers and Fries” which is the 14th highest. The last 10 have about a \$100 increase as you move up the list. The top 3 have roughly a \$1,000 difference as you go up the list.

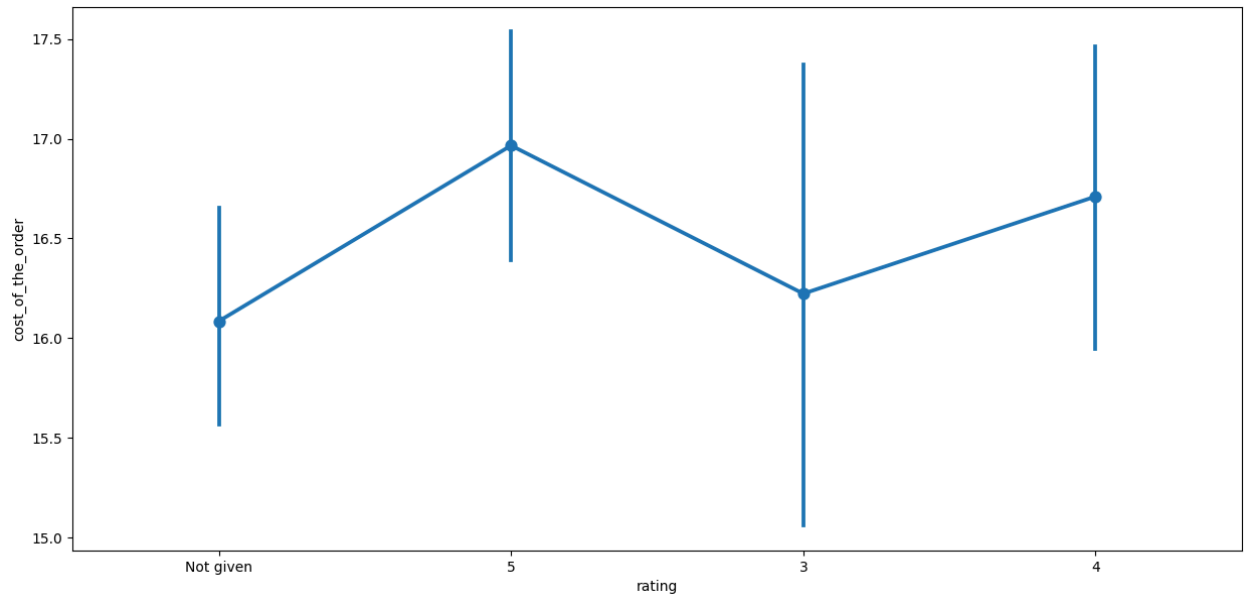
● Ratings vs. Delivery Time



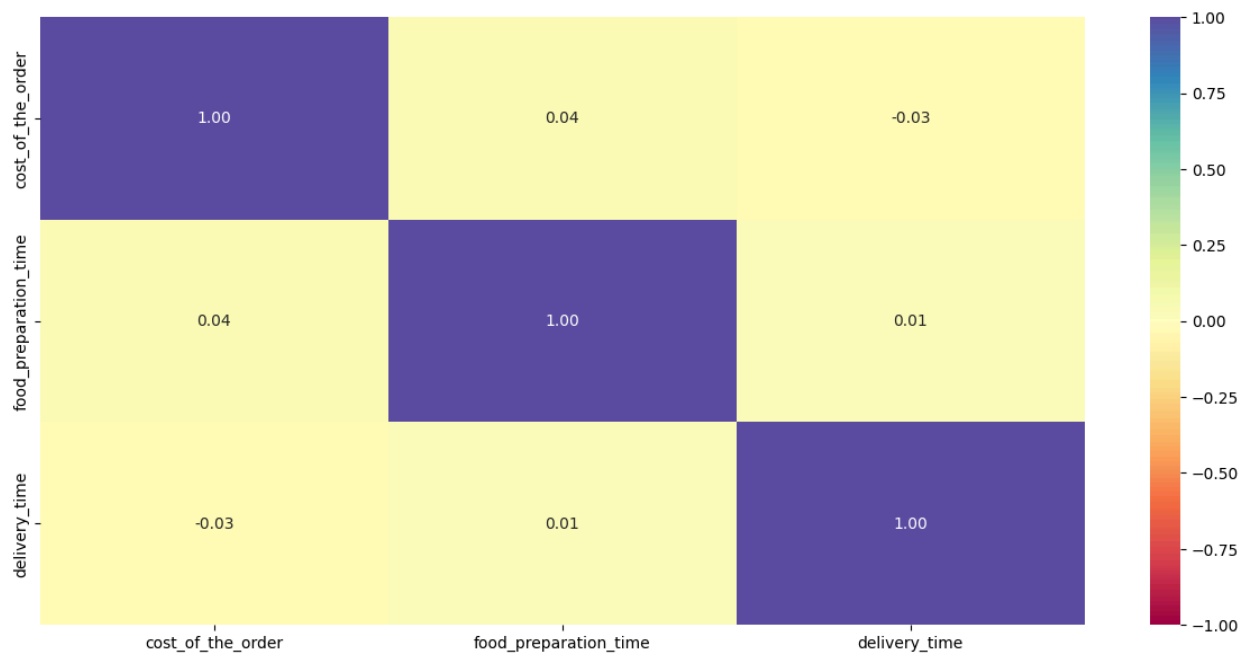
● Rating vs Food Preparation Time



● Rating vs Cost of the Order



● Correlation Among Variables



- **Advertisement Promotion:** Restaurants must have more than fifty ratings and the average rating has to be greater than four.

The table indicates the restaurants that qualify for the promotion.

	restaurant_name	rating
0	Shake Shack	133
1	The Meatball Shop	84
2	Blue Ribbon Sushi	73
3	Blue Ribbon Fried Chicken	64
4	RedFarm Broadway	41

- **Revenue Generated by Companies Across All Orders:** FoodHub charges the restaurant 25% on the orders having cost greater than 20 dollars and 15% on the orders having cost greater than 5 dollars.

order_id	customer_id	restaurant_name	cuisine_type	cost_of_the_order	day_of_the_week	rating	food_preparation_time	delivery_time
0	1477147	337525	Hangawi	Korean	30.75	Weekend	Not given	25
1	1477685	358141	Blue Ribbon Sushi Izakaya	Japanese	12.08	Weekend	Not given	25
2	1477070	66393	Cafe Habana	Mexican	12.23	Weekday	5	23
3	1477334	106968	Blue Ribbon Fried Chicken	American	29.20	Weekend	3	25
4	1478249	76942	Dirty Bird to Go	American	11.59	Weekday	4	25

- **Total Time to Delivered:** Note: It has been considered that the food has to be prepared and then delivered.

The number of total orders that take more than 60 minutes to get delivered is: 200

Percentage of orders that take more than 60 minutes to get delivered: 10.54 %

- **Delivery Time on Weekdays vs Weekends**

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The mean delivery time on weekdays is around 28 minutes.

The mean delivery time on weekends is around 22 minutes.

On average, deliveries are longer on the weekends vs the weekdays.

Conclusions and Recommendations

Conclusions:

1. **Ratings:** There is a positive correlation between shorter food preparation and delivery times with ratings. This would suggest that the customers are more satisfied when they receive their food faster.
2. **Delivery Time:** Delivery time is an important factor that correlates with positive customer ratings. Weekday and weekend delivery times are different. This is an opportunity for logistics and delivery time to be improved.
3. **Cost of an Order:** A large part of revenue is from orders greater than \$20. This allows for a business opportunity to implement promotions and price adjustments to take advantage of this fact.
4. **Popularity:** There is more popularity for certain cuisine types and restaurants (especially on weekends). This can be used to tailor resources and marketing.
5. **Low Ratings:** There is a group of restaurants and cuisine types with lower ratings. A focus can be on targeting restaurants and cuisine types with lower ratings. Some suggestions are improving the quality and efficiency of operations.

Recommendations:

Marketing and Promotions

1. **Weekend Promotions:** Italian cuisine is the most popular on the weekends; Foodhub could offer promotions for Italian food on the weekends to increase sales.
2. **Promotion on Expensive Orders:** A significant part of the revenue is obtained from orders over \$20. Therefore, FoodHub could target promotions to this set of orders.

3. **Restaurant Promotions:** Shake Shack, Siam Square and The Halal Guys all meet criteria for promotional offers. Therefore, FoodHub can advertise to these restaurants and offer customer incentives.

Operations and Logistics

1. **Reduce Delivery Time:** Lower delivery times correlate with higher customer satisfaction ratings. FoodHub should explore and analyze strategies to optimize delivery routes to provide lower delivery times for customers. This is particularly important during peak hours and on weekends.
2. **Resolve Weekday vs. Weekend Delivery Discrepancies:** There is an apparent discrepancy between the average delivery time on weekends versus weekdays. Weekend delivery times are slower than weekdays. A further investigation on the reasons should be explored and analyzed. Possible solutions based on the investigation could be increasing the amount of drivers and sectioning delivery zones differently.
3. **Improve Low-Ratings:** FoodHub could offer advice and partnership with low-rating restaurants to improve their ratings. This would require further investigation and analysis on the specifics of these restaurants. Some solutions may be increased training, menu changes and increased quality.
4. **Improve Food Preparation Time:** Foodhub could partner with restaurants to reduce the time of food preparations. A possible incentive could be offered to restaurants for faster turnaround time. In addition, Foodhub could work with restaurants to streamline workflows and provide more training.

Customer Experience

1. **Tailored Recommendations:** FoodHub can utilize customer data to provide tailored recommendations based on customers past preferences and orders. This would encourage repeat orders and improve the experience of using Foodhub.
2. **Reward Programs:** Foodhub can provide a reward program for customers with the highest utilization. These customers could be provided special discounts and priorities.
3. **Surveys and Ratings:** There were many customers who did not leave a rating. This provides an opportunity for Foodhub to encourage this customer demographic to participate in ratings. This will provide more data to improve Food Hubs services overall. Another opportunity is for FoodHub to encourage customers to complete customer satisfaction surveys. This can provide specific feedback and provide more areas to improve. Incentives can be provided especially for customers who have not left a rating.