FOODHUB: Aggregator Analysis

PYTHON FOUNDATIONS - NOVEMBER 2023

Topics

- Executive Summary
- Overview and Solution Approach
- Data Overview
- Exploration Analysis: Univariate & Multivariate
- Appendix

Executive Summary

- FOODHUB wants to gain insight from stored data to determine customer demand for participating restaurants. This information will enhance the experience of their customers and ultimately increase revenue.

- Main Objectives:
  - Most popular restaurants and cuisine type
  - Delivery time (Weekdays vs. Weekends)
  - Rating vs other unique variables

Conclusions

- There are more than twice as many orders on weekends than on weekdays and the delivery time is faster
- American food is the most popular and Shake Shack has the highest number of orders received
- The average order delivery time is less than 25 minutes which is great for New York
- Customers didn't seem to mind the Cost of the order as it ranged from $13 to $28
- Even though FOODHUB applies a surcharge, the restaurants still generate high revenue

Recommendations

- If FOODHUB wants to add different restaurants to their business line they need to hire more employees as not to increase delivery times
- A minimum cost of order needs to be established since orders even at $5 - $10 - $15 are charged a surcharge of 15%
- FOODHUB should look at the cuisine types that are underperforming, with order counts less than 10. These could be interchanged with different restaurants in popular cuisine types
- To improve weekday orders see if any restaurants are located within a specified radius of the main work areas. Couriers could be used to deliver food and would not need a vehicle

Overview

- New York has an abundance of restaurants and a lot of customers that don't have time to enjoy a sit down meal. FOODHUB is a delivery service with 178 participating restaurants. Registered customers can conveniently order online and FOODHUB will pickup the food from the restaurant and deliver it to the customer.

- FOODHUB uses a strategic process from the time it receives an online order, to food pickup at the restaurant and finally, delivery to the customer. The customer can rate FOODHUB based on their overall satisfaction from ease of ordering to timely delivery.

Overview & Analysis Categories

FOODHUB would like to analyze customer data to determine the demand of different restaurants that are available within the app.

Analysis Categories:

- Variety of Cuisines offered
- Restaurants with highest number of orders
- Delivery's during the Week vs. Weekends
- Customer Ratings

Solution Approach

Analyzing these factors will help FOODHUB determine

- Cuisine Variety
- Pinpoint the most popular Restaurants
- Most orders placed on specific days
- The highest ratings based on restaurant & delivery time

FOODHUB

Data Dictionary:

- **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**: 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

Data Overview

Orders Analyzed:
1898

Comparable Variables - 9

Order Ratings:
736 - Not Given
5 Stars - 588
4 Stars - 386
3 Stars - 188

Order Placed + Food Prep Statistics:
Minimum Time – 20 minutes
Maximum Time – 35 minutes
Average Time – 27 minutes

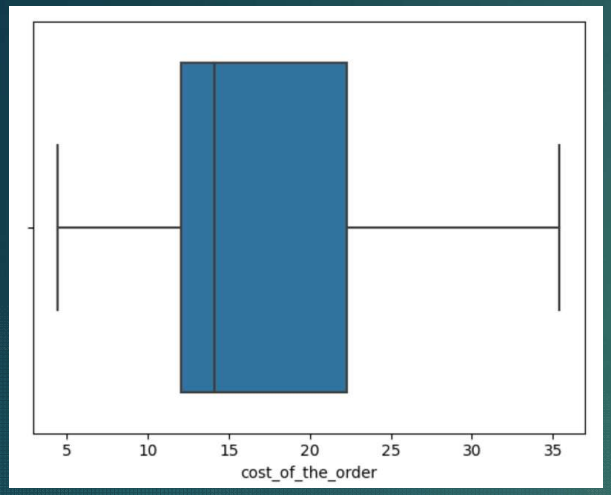
No Missing Values within the Data

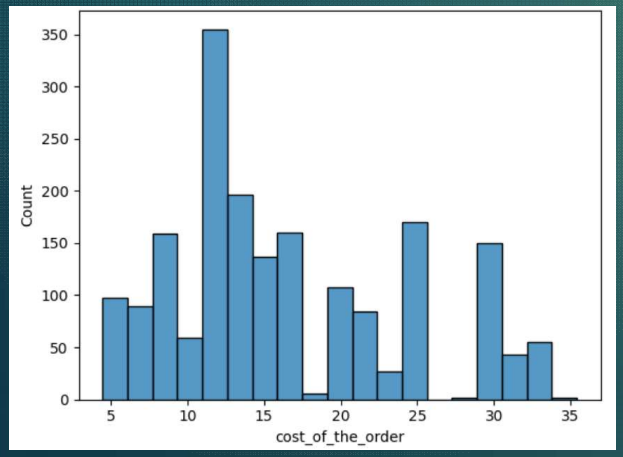
Univariate Analysis: Let's Explore

- Main Variables and how they connect and provide valuable information on their own:

Univariate Exploration Continued

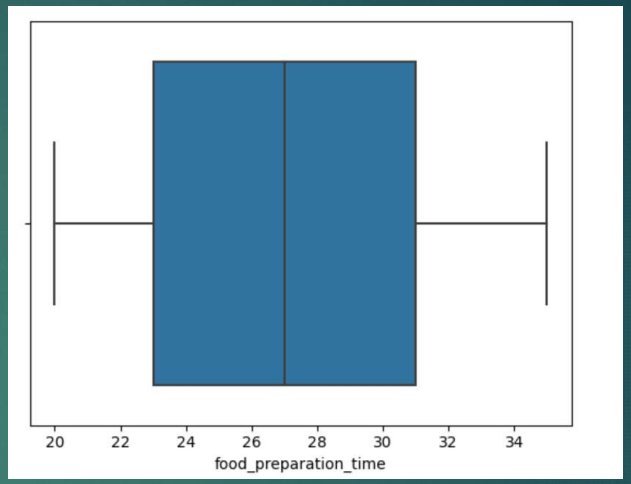
Cost of the Order

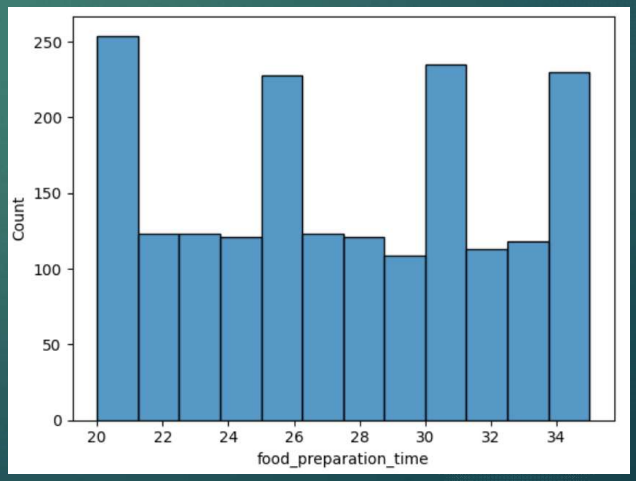




The average cost of an order is approx.. $14. Most orders fell between $13 - $23.
Having no outliers, the spread of Order Cost started at the lowest amount of $5 and the highest at $35.

Food Preparation Time

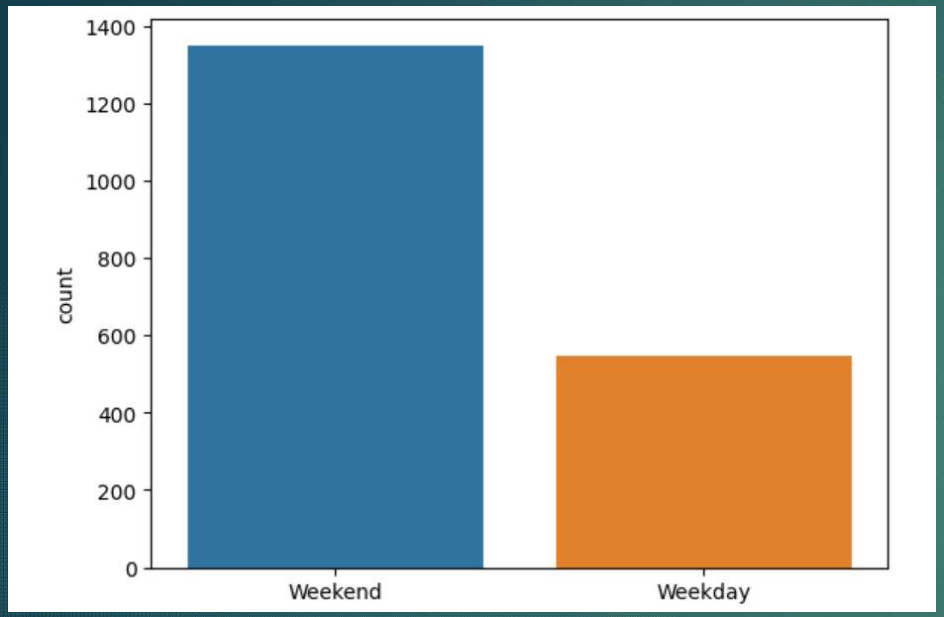




Food prep time took between 20 minutes and 37 minutes. The median food preparation time was 27 minutes.

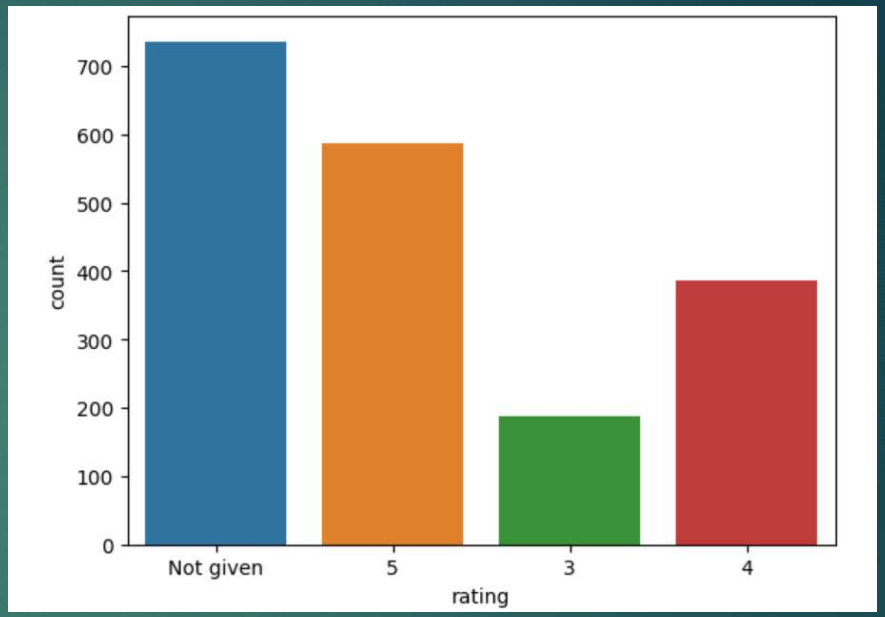
Univariate Exploration Continued

Day of the Week



The weekend orders far outweigh the weekdays. Approx. 1350 customers ordered on the weekend compared to only around 550 on weekdays.

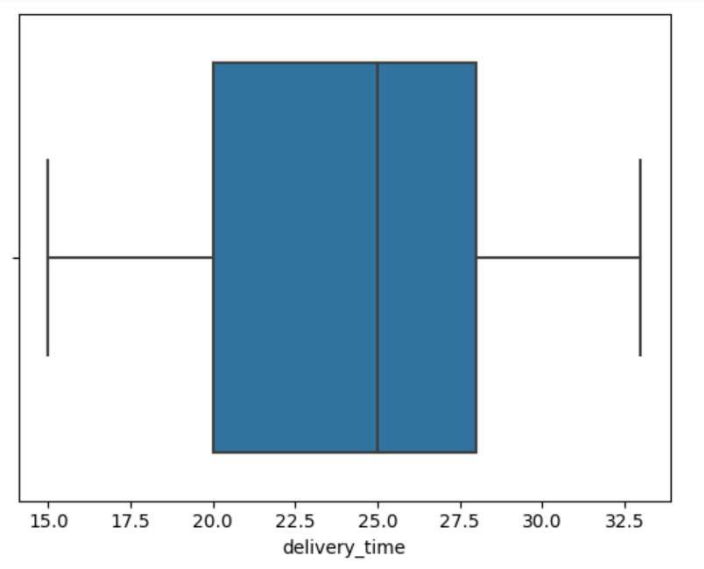
Rating

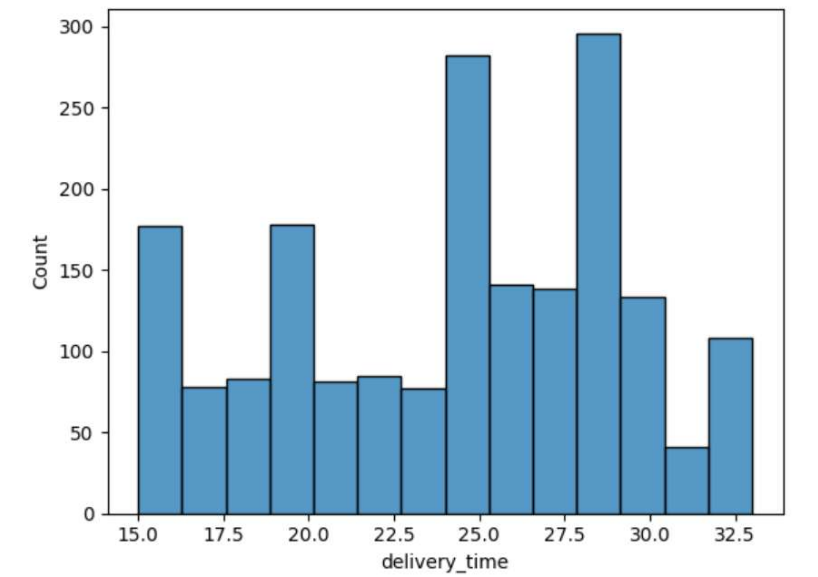


An average of 400 customers entered a rating. 588 customers gave a rating of 5, 386 customers gave a rating of 4, and 188 customers gave the lowest rating of 3.

Univariate Exploration Continued

Delivery Time





Approx. 290 orders were delivered in 28 minutes, followed by 25 minutes for 275 orders. Approx. 110 orders were delivered in32.5 minutes, this was the highest delivery time. Mean delivery time is 24.16 minutes.

Top 5 Restaurants by Orders Received

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

Shake Shack leads restaurant orders and matches up with American food being the most popular weekend cuisine.

Most popular Weekend Cuisine Types

American	415
Japanese	335
Italian	207
Chinese	163
Mexican	53
Indian	49
Mediterranean	32
Middle Eastern	32
Thai	15
French	13
Korean	11
Southern	11
Spanish	11
Vietnamese	4

Percentage of Orders over $20

```
The number of total orders that cost above 20 dollars is: 555
Percentage of orders above 20 dollars: 29.24 %
```

The order percentage is low compared to the price of the meal. There may need to be a minimum delivery area for orders less than $20 to make it worth while to FOODHUB.

20% Discount Vouchers – Top 3 Frequent Customers

52832	13
47440	10
83287	9

These customers will receive a 20% discount. This is based on using their Customer Id Number and how many time it appears in the Dataset

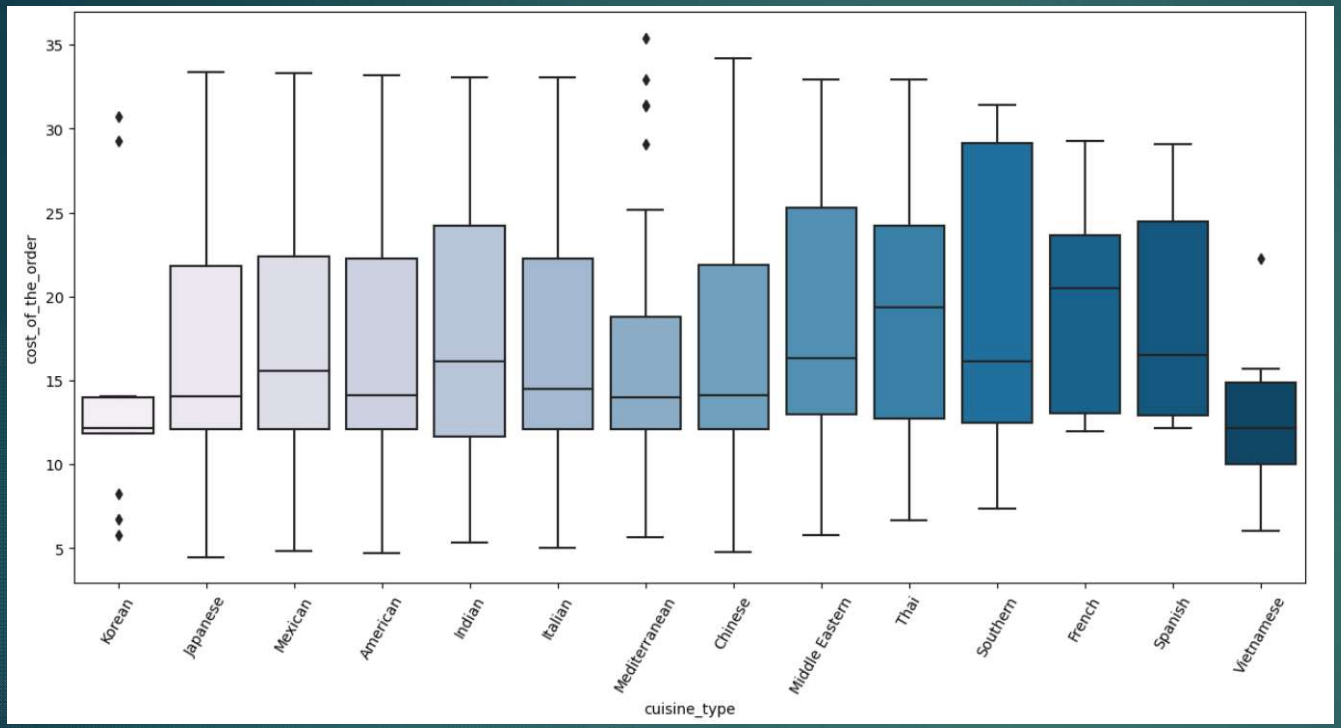
Multivariate Analysis: Association Exploration

- Multivariate Analysis evaluates more than two variables and their association to each other.
  - Revenue Generated by the Top 14 Restaurants:

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

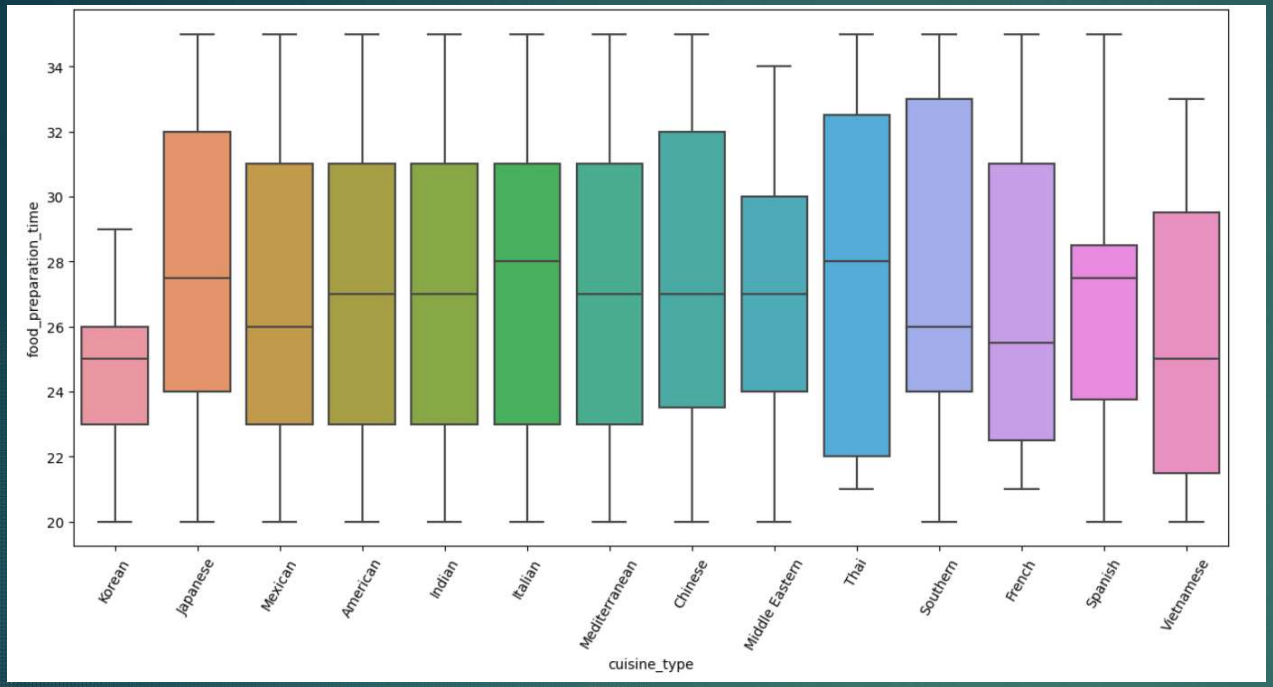
Restaurants that are considered fast access have the highest generated revenue

Cuisine vs. Cost of the Order



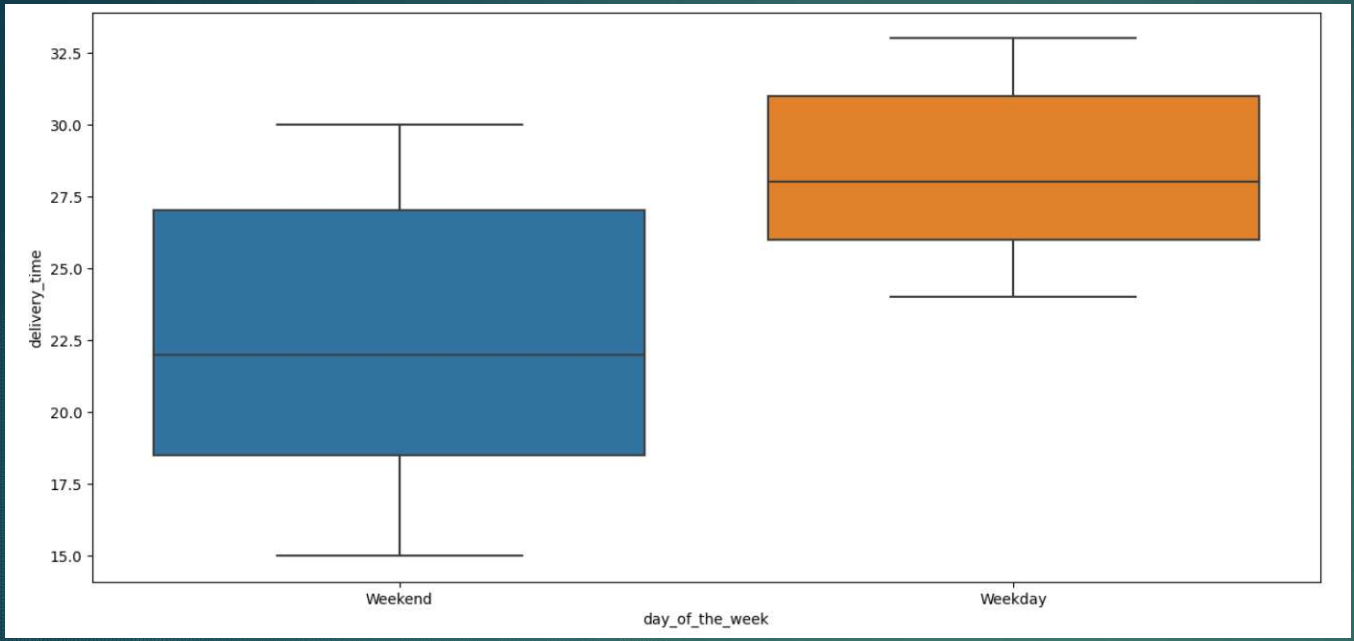
- 7 types of cuisine are shown to cost approx. $33
- Chinese Food had the most range in Cost of the Order
- Korean food had the most drastic Order cost with outliers at $5 and over $30

Cuisine vs. Food Prep Time



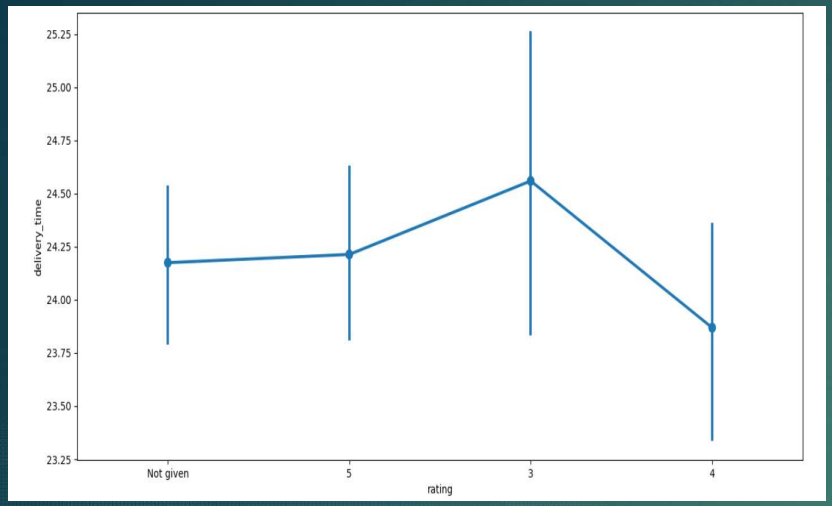
- Most of the Food Prep Time fell between 26 to 28 minutes
- There are no outliers and all Cuisine Types are very consistent in getting the food prepared within 23 minutes to 32 minutes
- Thai cuisine shows the largest range of Food Prep Time

Day of the Week vs. Delivery Time

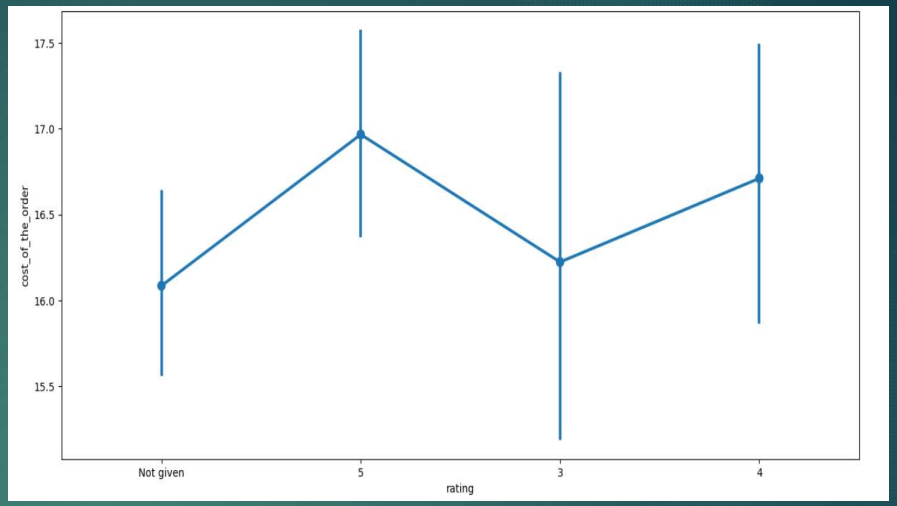


- The Delivery Time on the Weekend is much shorter, because there is less traffic. 30 minutes is the longest Delivery Time, but a median of 21 minutes
- On the Weekdays orders take at minimum 25 minutes and up to 32.5 minutes

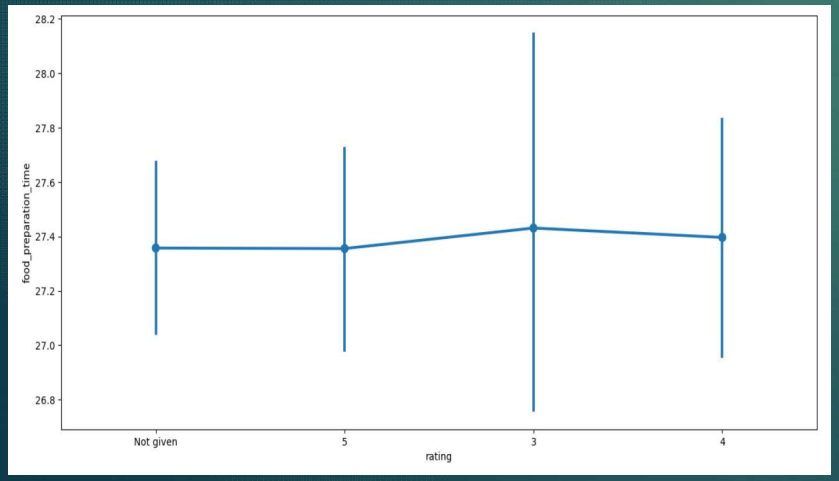
Rating vs. Delivery Time



Rating vs. Cost of the Order



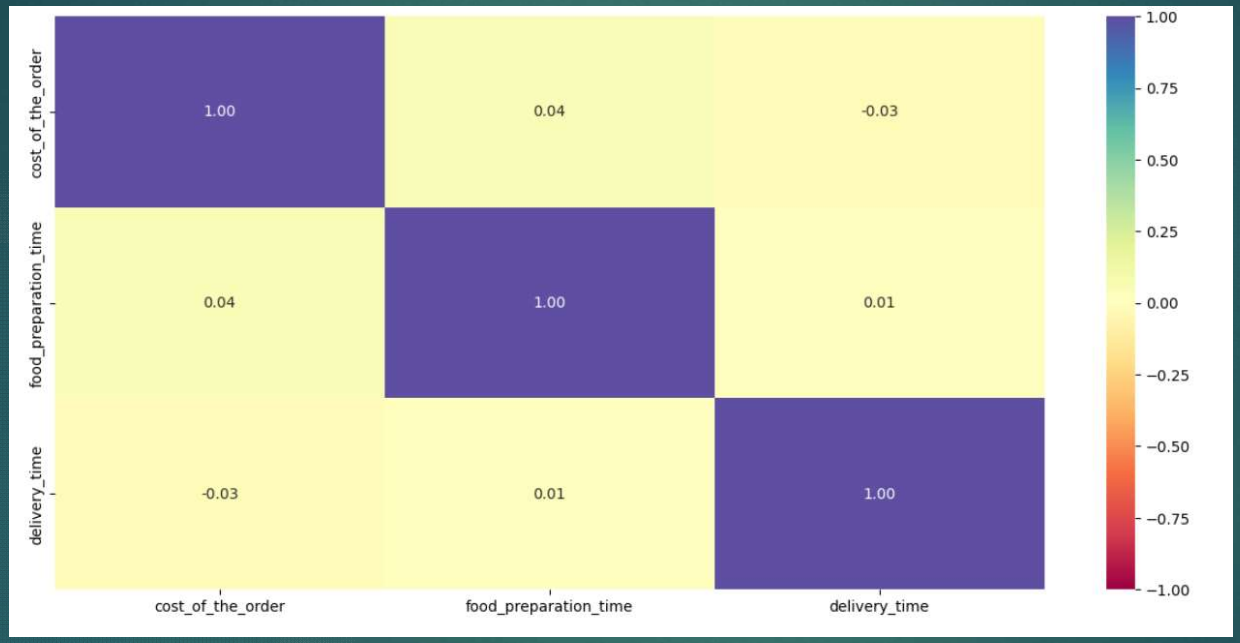
Rating vs. Food Prep Time



- The Delivery Time determine the rating consistently. Faster delivery = higher rating
- Food Prep Time was pretty equal in ratings, the time was minimal to receive a rating of 3
- Cost of the Order was within approx. .75 cents of each other. Was not a determining factor in the rating that was given

Correlation Among Variables

Heatmap - Correlation among Variables



Food Prep Time and Cost of the order showed the highest correlation
Delivery Time shows negative correlation with Cost of the Order

FOODHUB wants to provide a discount on advertising to the restaurants that have more than 50 ratings that are greater than 4

	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

These restaurants will be able to receive the promotion from FOODHUB

FOODHUB charges a surcharge for using their service:

Orders greater than $20 are charged 25%

Orders greater than $5 are charged 15%

Revenue Column Created

	order_id	customer_id	restaurant_name	cuisine_type	cost_of_the_order	day_of_the_week	rating	food_preparation_time	delivery_time	Revenue
0	1477147	337525	Hangawi	Korean	30.75	Weekend	Not given	25	20	7.6875
1	1477685	358141	Blue Ribbon Sushi Izakaya	Japanese	12.08	Weekend	Not given	25	23	1.8120
2	1477070	66393	Cafe Habana	Mexican	12.23	Weekday	5	23	28	1.8345
3	1477334	106968	Blue Ribbon Fried Chicken	American	29.20	Weekend	3	25	15	7.3000
4	1478249	76942	Dirty Bird to Go	American	11.59	Weekday	4	25	24	1.7385

Total Net Revenue for all Restaurants

```
The net revenue is around 0       7.69
1         1.81
2         1.83
3         7.30
4         1.74
          ...
1893      5.58
1894      1.83
1895      6.30
1896      1.83
1897      2.92
```

- Revenue column was inserted for each restaurant based on their unique order Id numbers
- The Total Net Revenue for all restaurants is around $7.69
- Most orders are greater than $20 to produce such a large revenue amount

Analyze the total time required to deliver the food and delivery times on weekdays and weekends

Percentage of orders taking more than 60 minutes to be delivered from the time the order is placed

```
The total number of orders that took longer than 60 minutes is: 200
The percentage of orders that have more than 60 minutes total delivery time: 10.54 %
```

- Out of 1,898 total orders only 200 took longer than 60 minutes
- 10.54% of all orders taking this long is very small for the amount of total orders taken

How does the mean delivery time vary during weekdays and weekends

```
The mean delivery time on weekends is around 22 minutes
```

- There is a significant improvement on delivery order time on the weekend. The average time is 22 minutes. Weekdays it is 28 minutes,