FoodHub Customer Experience Improvement

Project 1(FoodHub) - Python Foundations

19th August 2022

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Executive Summary - Conclusions

- Delivery times are lower at the weekends even though most orders are placed at the weekends.
- American cuisine is the most preferred cuisine on weekends and weekdays.
- French cuisine is generally more expensive although it is not the most expensive cuisine.
- It is good to know that there are many customers who are satisfied with the service evidenced by their repeat use of Food Hub.
- About half of the customers (about 51%) are satisfied with the order by rating at least 4.
- No customer rated below 3 points for their orders. However, there should be a further investigation if there are repeat customers that rated their orders 3 points.
- Combination of factors (cost of orders, delivery time, and food preparation time) come together to affect the ratings of orders, considering the factors in isolation does not reveal the true picture of customer rating behaviour. More investigation is needed in this regard.
- The cheapest cuisines with long preparation times have the lowest ratings.

Executive Summary - Recommendations

- To increase revenue, Food Hub can focus on pushing more adverts for American, Japanese, and Italian cuisines.
- Weekends have the most orders. Ensure that there's available dispatch on weekends.
- There needs to be further investigation on the reason for longer delivery time on weekdays. Could it be due to traffic congestion?
- Delivery times could also be optimised to ensure that there's availability of dispatch for the most demanded cuisines like American, Japanese, and Italian.
- Reduce the food preparation time or the total time (order + delivery time) to enhance the customer experience.
- Implementing the insights will improve the order ratings, by extension improve customer experience which will in turn increase repeat customers and FoodHub's revenue.

Business Problem Overview and Solution Approach

- Many students and professionals opt for online food delivery services for their meals due to their busy lifestyles. Food Hub is an online hub that provides food delivery services where customers can place orders from restaurants on the Food Hub platform and get the food delivered to them within New York.
- With the increasing number of restaurants in the New York and online food delivery service customer satisfaction is important. To improve customer experience and service, Food Hub must understand the demand for different restaurants, cuisine types, order delivery time and data relating to times of the week with the most orders on the Food Hub online platform.
- Therefore, data related to food orders was analysed to first of all understand the data structure, determined the preferred restaurants that customers usually order their meals, evaluated the total time taken for customers to receive their meals after placing orders in a bid to finding gaps and tailored solutions for improvement.

Business Problem Overview and Solution Approach

- Since ratings reflect customer satisfaction, ratings were compared with cuisine type, restaurants, order delivery time, food preparation time, and cost of the order to determine the level of customer satisfaction.
- The relationship between the cost of the order, food preparation time, and delivery time is evaluated to determine their relationships to see how improvement in one can affect another.
- Determine which cuisine types take the most time to get prepared.
- Using the cost of orders, determine the total revenue that Food Hub will make from order delivery charges.
- Determine which restaurants meet the requirements for promotional offers to support the restaurants with promotional adverts to users.
- Finally, the mean total delivery time on weekdays and weekends is compared to determine which is faster.

Data Overview

The dataset consists of date relating to food orders by customers on Food Hub from restaurants within New York

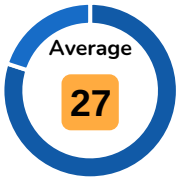
Variable	Description	Data Type
order_id	Unique id of the order	Integer
customer_id	Id of customer that ordered the food	Integer
restaurant_name	Name of the restaurant	Object
cuisine_type	Cuisine ordered by the customer	Object
cost_of_the_order	Cost of the order	Float
day_of_the_week	Indicates whether the order is placed on a weekend or weekday	Object
rating	Rating given by the customer out of 5	Object
food_preparation_time	Time (in minutes) taken to prepare the food	Integer
delivery_time	Time (in minutes) taken to deliver the food	Integer

Data Overview

Weekday is from Monday to Friday and the weekend is Saturday and Sunday.

- There are a total of 1898 entries and 9 variables in the study.
- Data types: 1 float, 4 integers, and 4 objects
- There are no missing values in the data set although not all customers rated. For the unrated cells, these have been filled with “Not given”
- However, to determine restaurants that qualify for promotional adverts, the “ratings” data type was converted to integers.
- A total of 736 entries were not rated

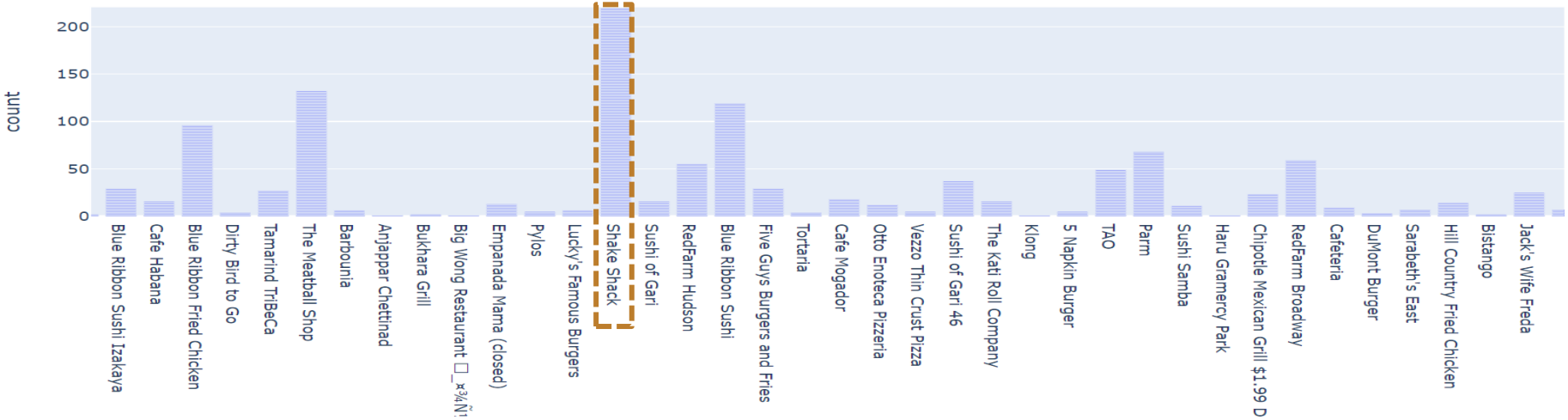
Food Preparation Time



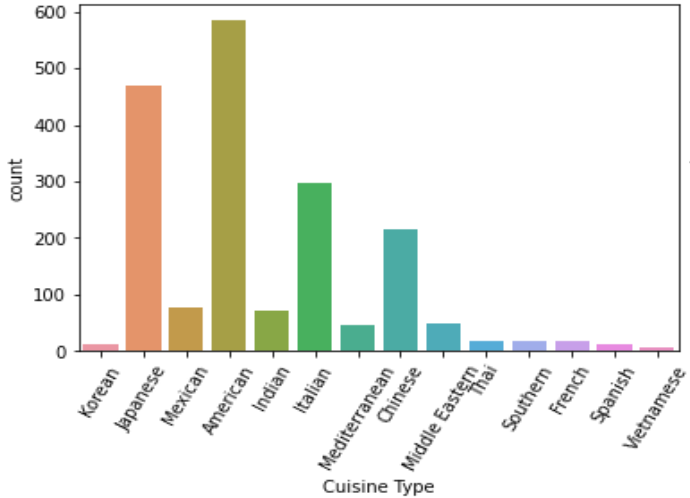
Univariate Analysis – Order ID, Customer ID, Restaurant Names

Variable	Description	No. of Unique Entries
order_id	Unique id of the order	1898
customer_id	Id of customer that ordered the food	1200
restaurant_name	Name of the restaurant	178

- 1200 customers placed a total of 1898 orders from 178 different restaurants.
- There are some repeat customers.
- Most meals were ordered from Shake Shack.

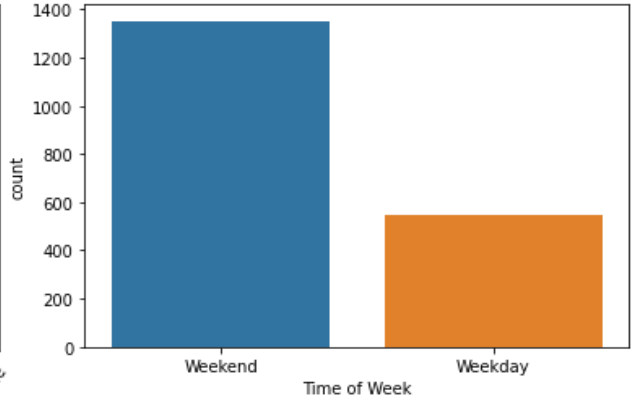


Univariate Analysis – Cuisine Type, Time of Week, Rating



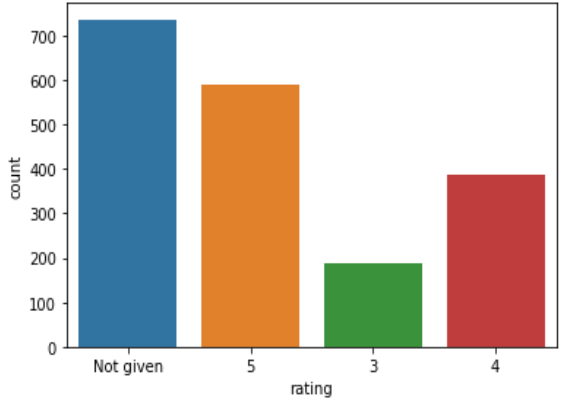
Observations:

- American cuisine is the most ordered cuisine type.
- American, Japanese, Italian, and Mediterranean Chinese make more than 50% of the ordered cuisine types
- Vietnamese cuisine is the lowest ordered cuisine type.



Observations:

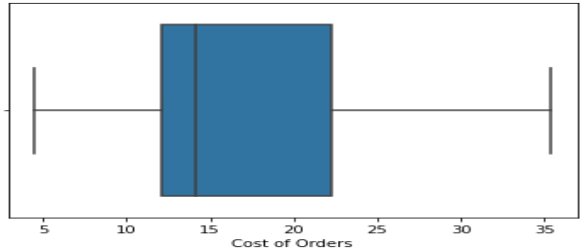
- Weekend orders are more than 2 times greater than weekday orders

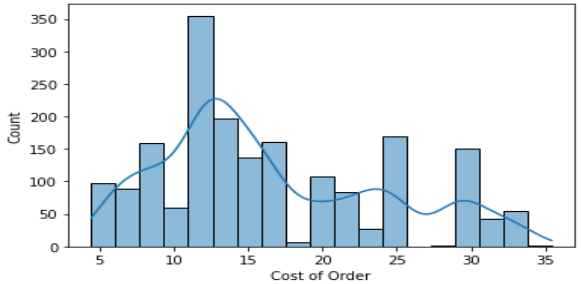


Observations:

- 39% of orders are not rated.
- 31% of orders have a rating of 5.
- 20% of orders have a rating of 4.

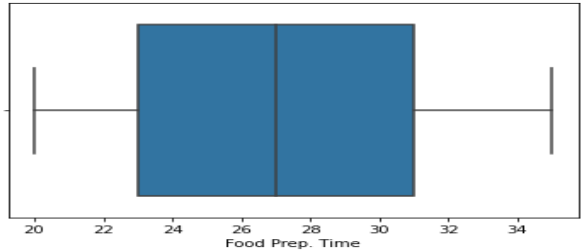
Univariate Analysis – Cost of Orders, Food Prep. Time and Delivery Time

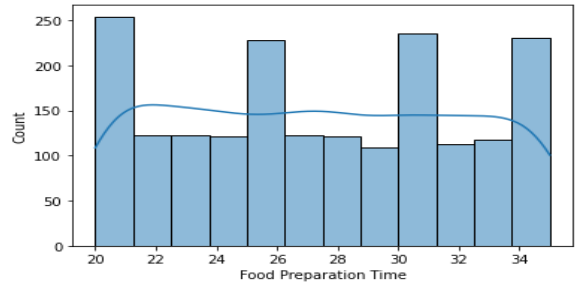




Observations:

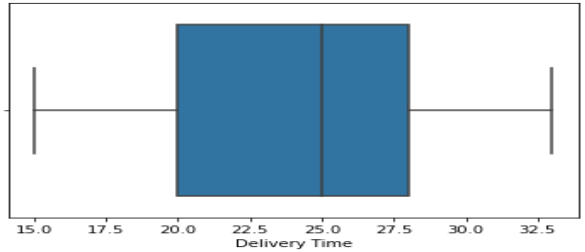
- The median cost of the orders is about $14
- The distribution is right-skewed and without outliers.

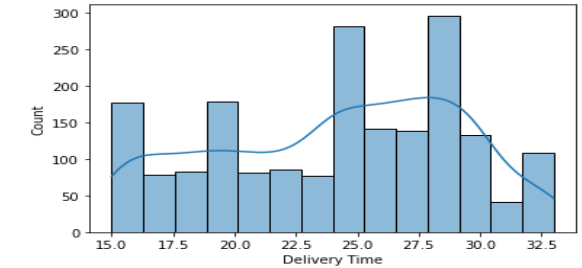




Observations:

- 50% of orders required less than 27 minutes to prepare.
- The multimodal nature shows that multiple variables affect food preparation time.
- There are no outliers.

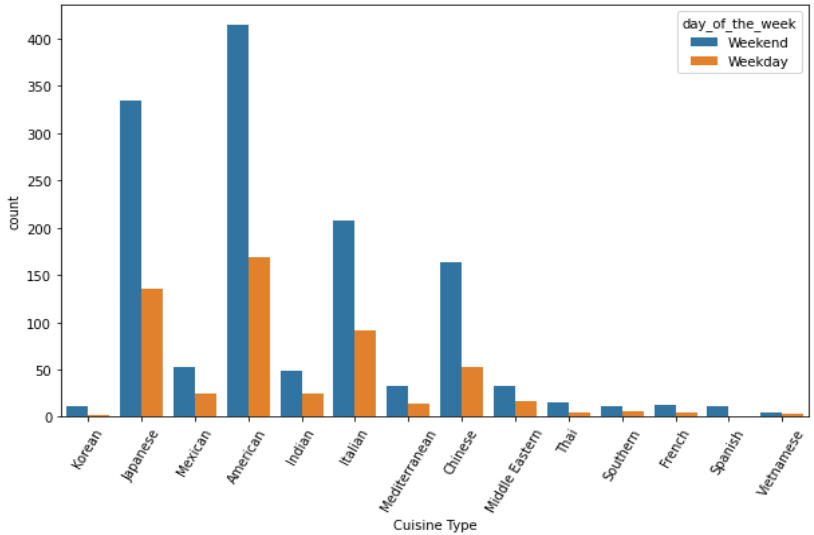




Observations:

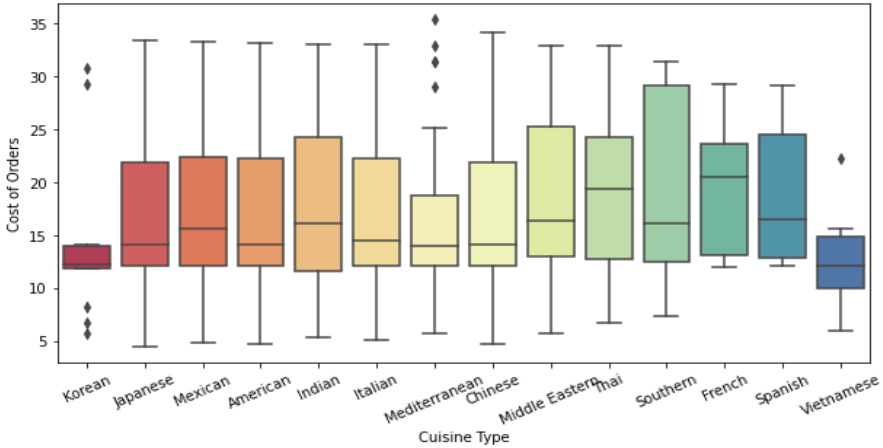
- 50% of orders required less than 25 minutes for delivery.
- The bimodal nature shows that 2 variables affect the delivery time. No outliers.
- Slightly left skewed.

Univariate Analysis – Most Popular Cuisine, Orders Costing Above 20%, Mean Order Delivery Time, Top 3 Most Frequent Customers



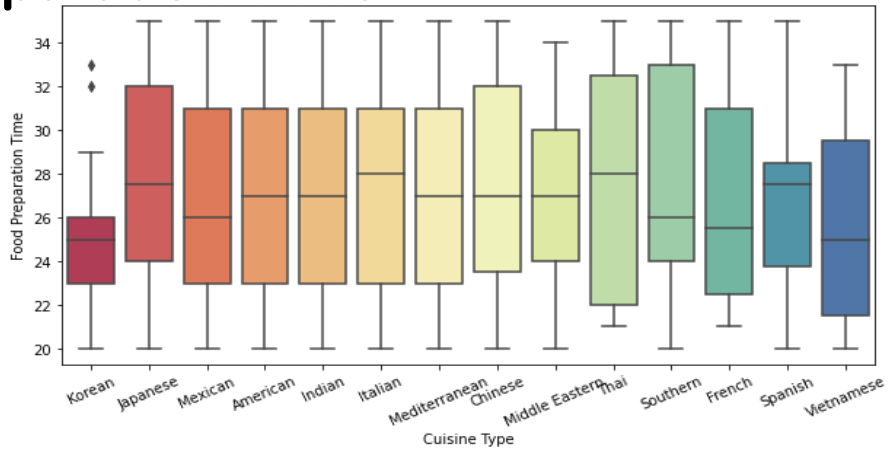
- American cuisine is most popular at the weekends.
- There are 555 orders costing above $20 which makes up 29.24 % of all orders.
- It takes an average of 24 minutes to deliver a meal after it has been picked up from the restaurant.
- The top 3 most frequent customers are 52832, 47440, and 83287 with 13, 10, and 9 orders respectively.

Multivariate Analysis – Cuisine Type VS Cost of Orders and Food Preparation Time



Observations:

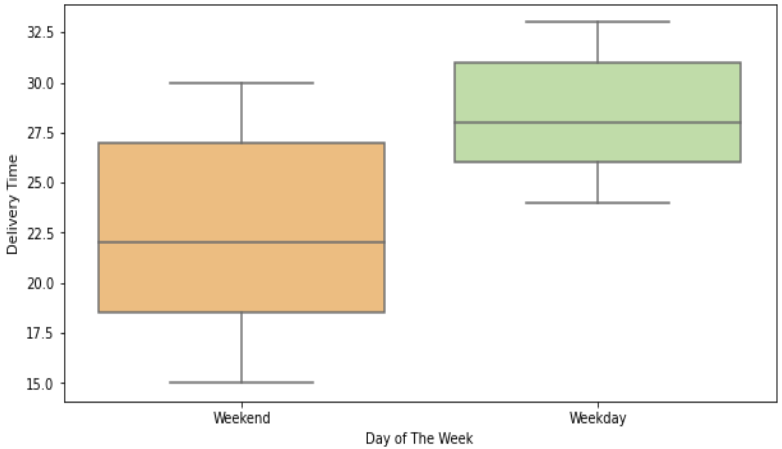
- French cuisines are generally more expensive followed closely by Thai cuisine.
- However, some Mediterranean cuisines are the most expensive as seen by the outliers.
- Although Korean and Vietnamese cuisines are the cheapest they both have some outliers.



Observations:

- Korean cuisines generally require the shortest preparation times however there are some outliers.
- More than 50% of Thai and Italian cuisines take more than 28 minutes.

Multivariate Analysis – Delivery Time VS Day of The Week

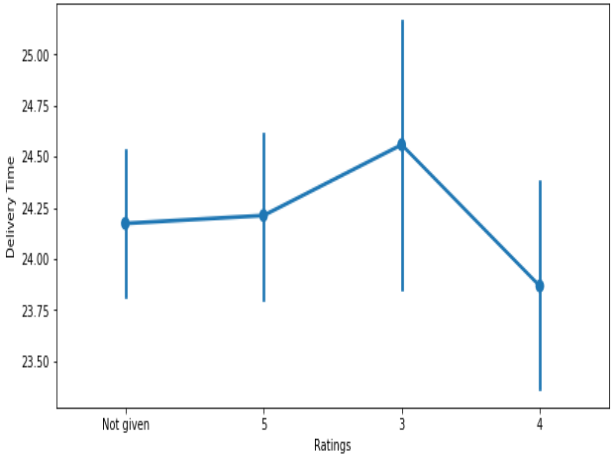


Observations:

- There are no outliers
- It takes at least 24 minutes on weekdays for all deliveries.
- Whereas 50% of deliveries take less than 22 minutes on weekends.
- It will be important to compare the total orders at the weekends VS those on weekdays.

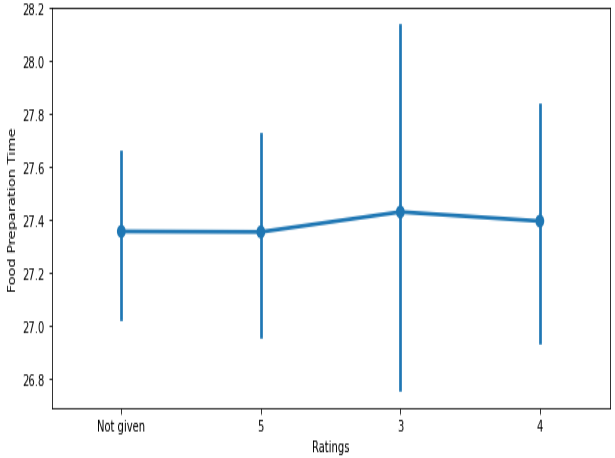
- Of all the restaurants, Shake Shack has the highest revenue of about $3,580. More than 80% larger than the second highest revenue earner: The Meatball Shop @ $1904.
- The top 4 restaurants with the highest revenues are Shake Shack, The Meatball Shop, Blue Ribbon Sushi, Blue Ribbon Fried Chicken, and Parm.

Multivariate Analysis – Ratings VS Delivery Time, Food Preparation Time, and Cost of The Order



Observations:

- Ratings of 3 have the widest range of delivery times and the highest delivery times.



Observations:

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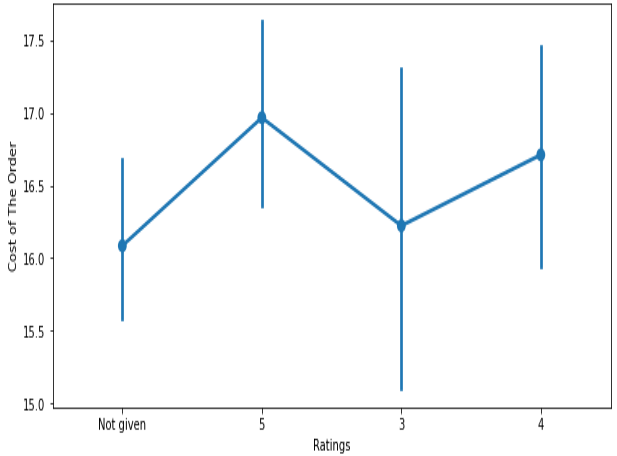
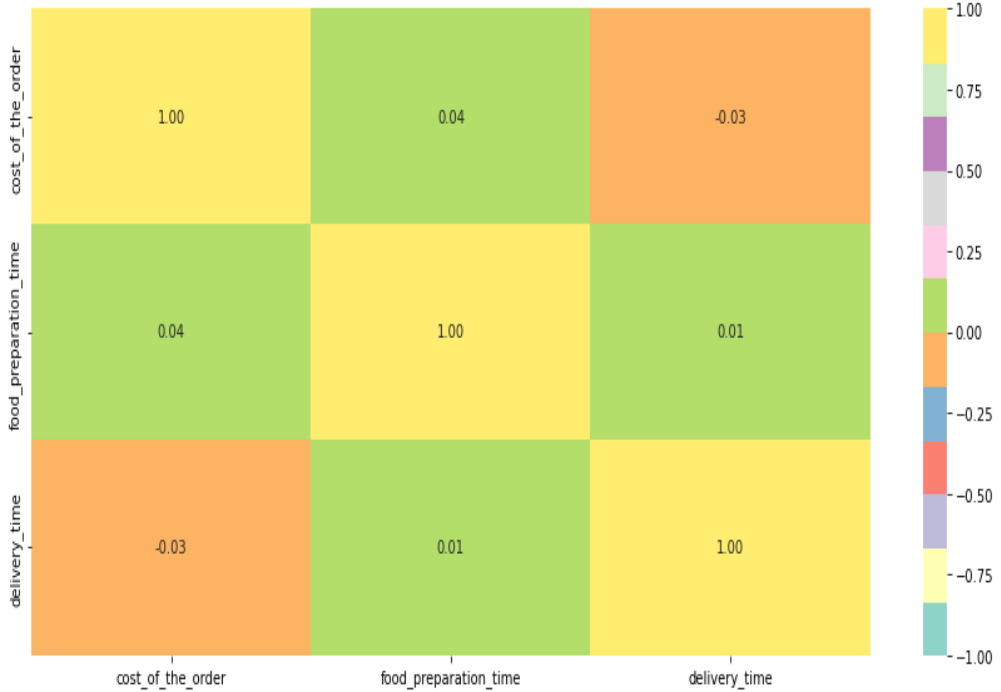


Observations:

- Ratings of 3 have the widest range in terms of cost of orders.
- Orders rated 5 are the most expensive.

Multivariate Analysis – Correlation Matrix



Observations:

- Cost of Orders and Delivery Time are slightly negatively correlated.
- Food Preparation Time and Delivery Time are slightly positively correlated.
- Cost of Orders and Food Preparation Time are slightly positively correlated.

Multivariate Analysis – Promotional Offer, Net Revenue, Total Time and Delivery Time

- The Meatball Shop, Blue Ribbon Fried Chicken, Shake Shack, and Blue Ribbon Sushi are entitled to the promotional offer having met the requirements
- FoodHub's net revenue is $6,166.

- The percentage of orders that took more than 60 minutes for total delivery time is 10.54 %
  - The mean delivery time on weekdays is around 28 minutes
  - The mean delivery time on weekends is around 22 minutes

APPENDIX

Tables – Top 4 Restaurants (Ratings, Ave. Ratings, Net Revenue/Restaurant)

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

	restaurant_name	rating
0	The Meatball Shop	4.511905
1	Blue Ribbon Fried Chicken	4.328125
2	Shake Shack	4.278195
3	Blue Ribbon Sushi	4.219178

	restaurant_name	Revenue
0	Shake Shack	703.6070
1	The Meatball Shop	419.8285
2	Blue Ribbon Sushi	360.4605
3	Blue Ribbon Fried Chicken	340.2035
4	Parm	218.5570

Total Revenue made by restaurants is $31,315

Great Learning

Happy Learning !