Food Hub Case Study

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FOODHUB™

Background

People have busy lives, and they rely on convenience to accommodate them. With this being the case, online food delivery service is a great option.

The smartphone app allows restaurants to receive direct orders from customers. The app assigns a delivery person who picks up the order from the restaurant and delivers it to the customer. The customer rates their experience via the app. FoodHub earns money by collecting a percentage of the cost of the order.

New York has a vast number of restaurants and a food aggregator company like FoodHub offers access to multiple restaurants via a smartphone app.

In order to remain a leader in the food aggregation market, the business must be proactive in understanding trends and conducting appropriate analysis in order to employ strategies to remain competitive.

Objective:

To extract actionable insights from the data that we have collected over the past 6 months to optimize resources and identify area of growth and improvement.

Today's discussion will be focused on the following topics:

- ❑ Variables that influence pickups
- ❑ Factors that affect pickups the most and the respective reasons
- ❑ Ways to capitalize on fluctuating demand

Data Dictionary:

Variable	Description
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

Observations	Variables	Duration
1,898	9	6 months

Notes:

- No missing values
- There were a significant number of orders missing a rating
- Restaurant name, cuisine type, and day of week columns converted to categories for better data analysis

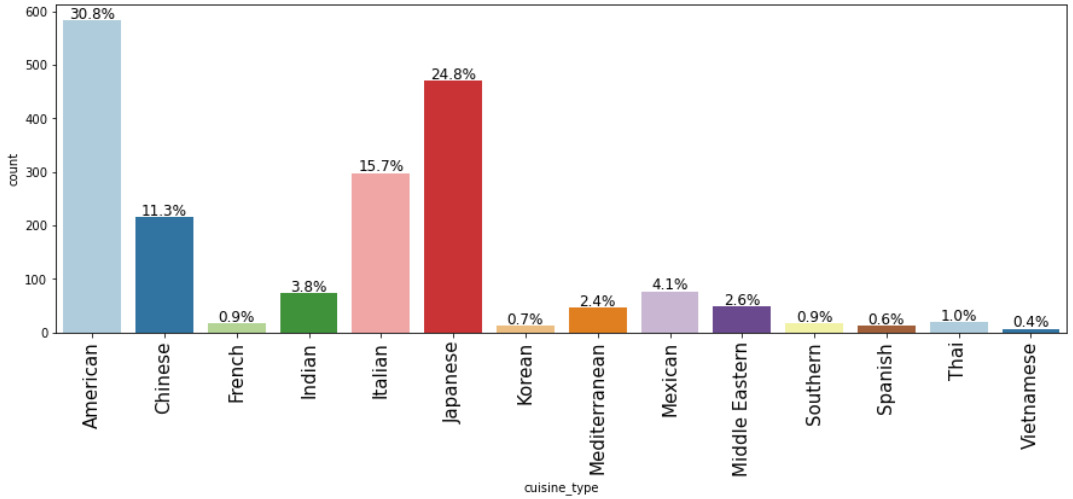
Statistical Summary of Numerical Data:

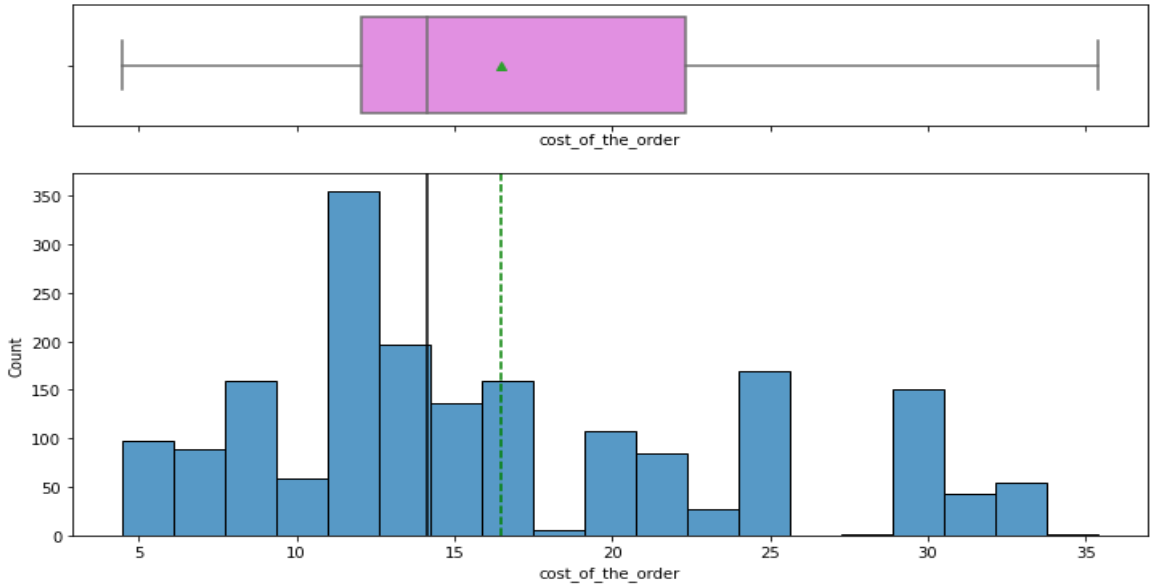
	order_id	customer_id	cost_of_the_order	food_preparation_time	delivery_time
count	1898.00	1898.00	1898.00	1898.00	1898.00
mean	1477495.50	171168.48	16.50	27.37	24.16
std	548.05	113698.14	7.48	4.63	4.97
min	1476547.00	1311.00	4.47	20.00	15.00
25%	1477021.25	77787.75	12.08	23.00	20.00
50%	1477495.50	128600.00	14.14	27.00	25.00
75%	1477969.75	270525.00	22.30	31.00	28.00
max	1478444.00	405334.00	35.41	35.00	33.00

Notes:

- order_id & customer_id are numerical fields; but are just identifiers for the app
- No statistical summaries need to be utilized for these

Exploratory Data Analysis: Univariate

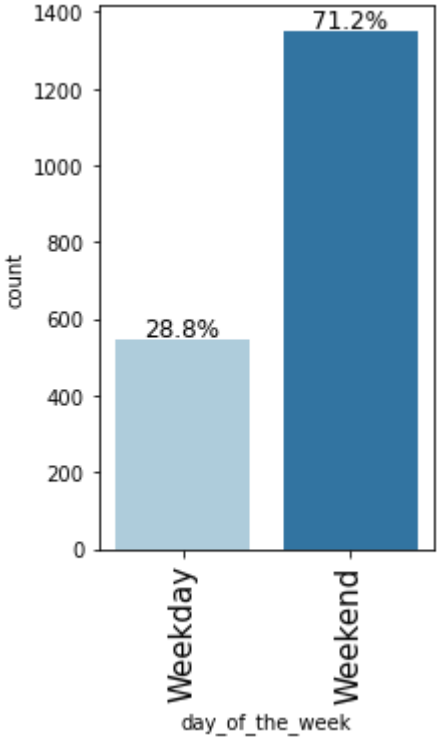


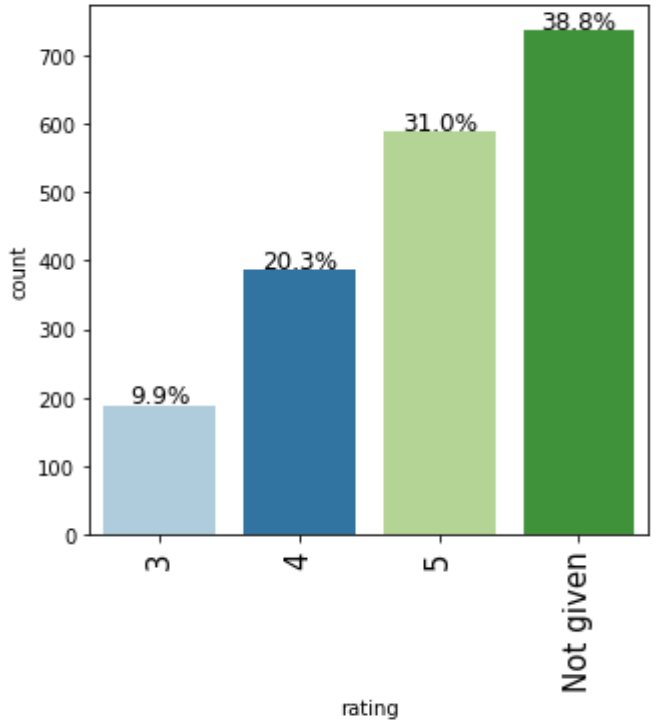


Observations:

- American, Japanese, and Italian are the most popular cuisines based upon number of orders received
- Median cost of order is ~$14
- Mean (average) cost of order ~$16
- Data is skewed to the right; most of orders cost less than the median

Exploratory Data Analysis: Univariate

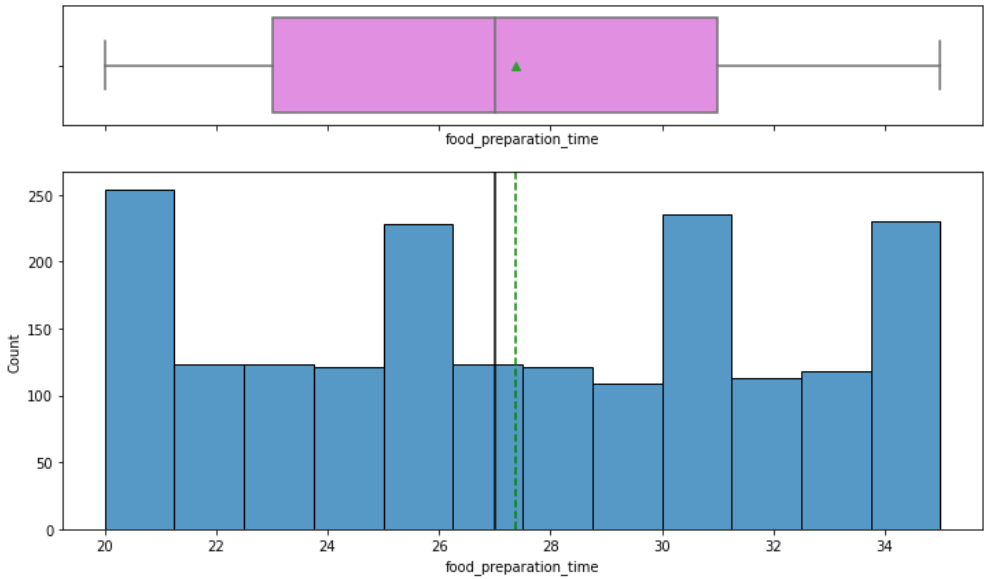


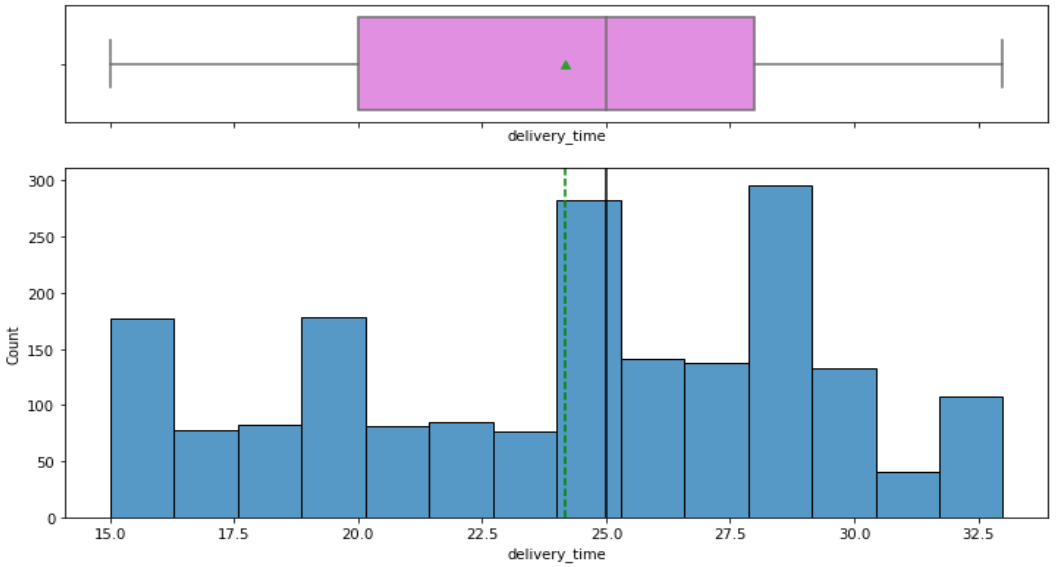


Observations:

- Majority of the orders are made on the weekends
- Majority of the customer don't leave a rating or provide a 5 rating

Exploratory Data Analysis: Univariate





Observations:

- Food preparation time almost has almost a symmetric curve (slight right skew); about same number of orders take less or more than 27 mins.
- Delivery Time has a left skew; majority of orders are taking less than median delivery time of 25 mins

Top 5 Restaurants (Orders Received)

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

Most Popular Weekend Restaurants

Restaurant	Orders
American	415
Japanese	335
Italian	207
Chinese	163
Mexican	53

Additional Insights

Percentage of orders that cost more than $20:

- 555

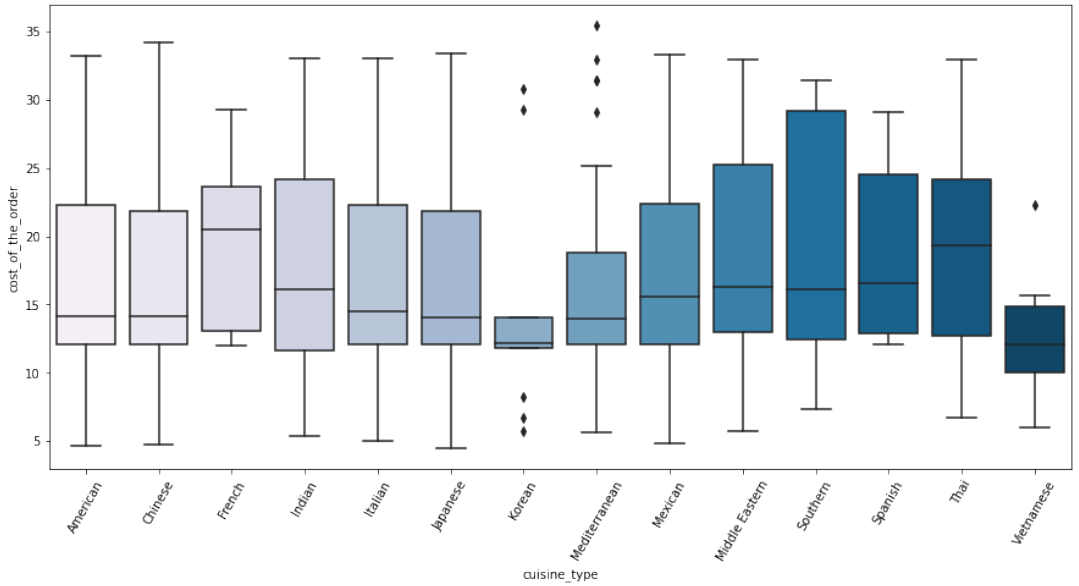
The average (mean) delivery time:

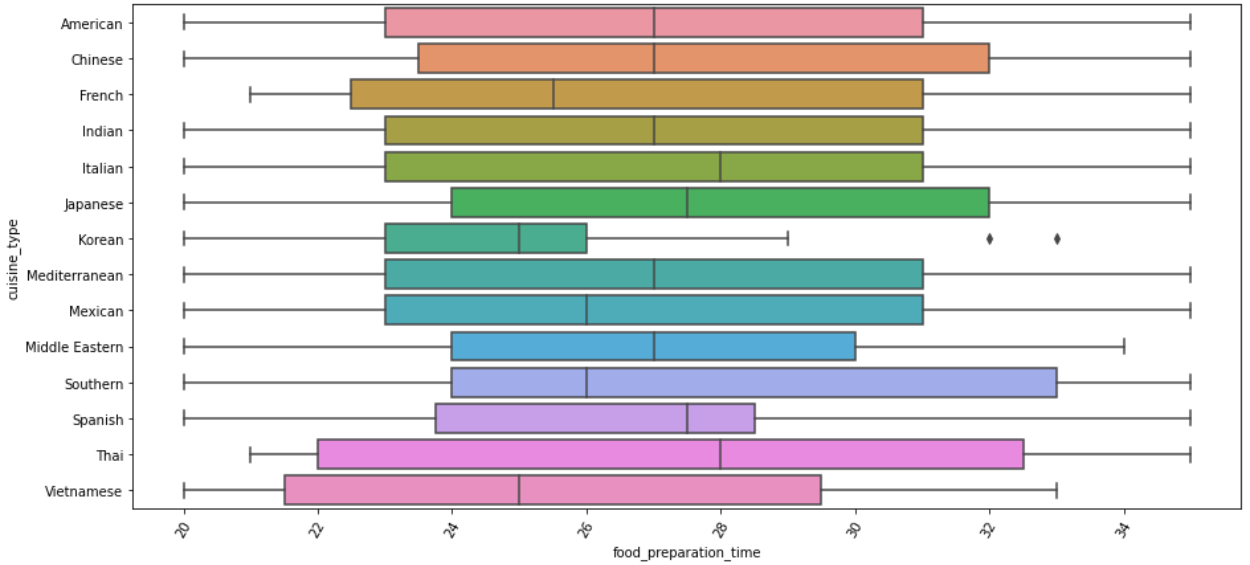
- 29.24 minutes

The number of orders placed by the top 5 customers:

- 13
- 10
- 9
- 8
- 7

Exploratory Data Analysis: Multivariate





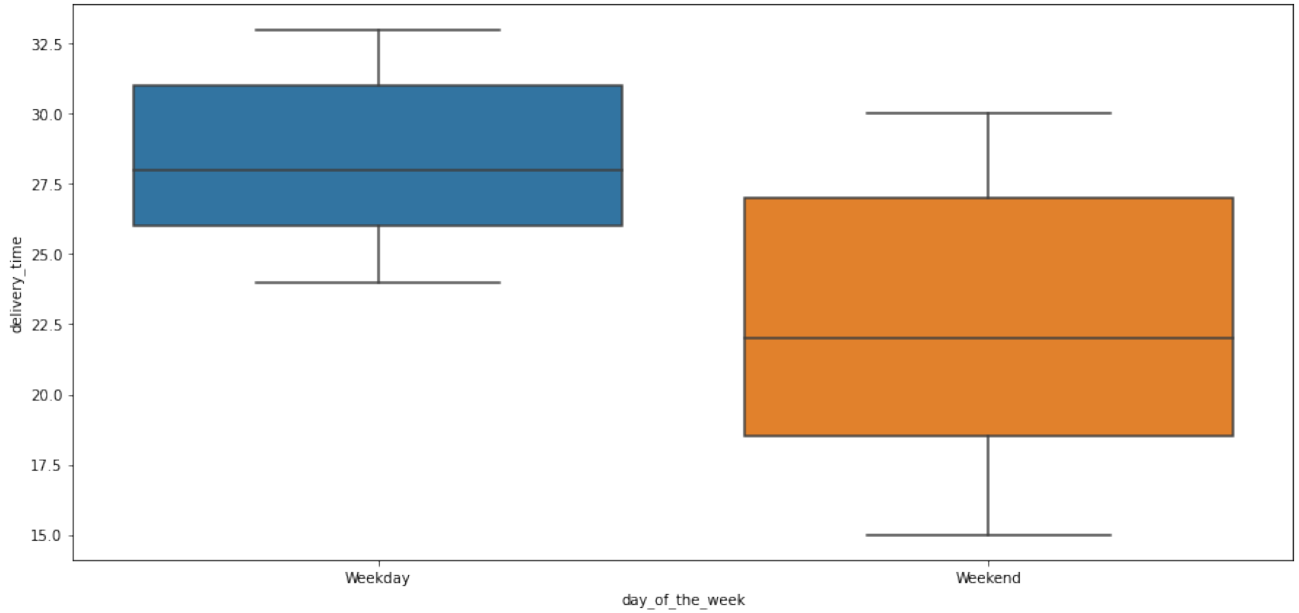
Observations:

- Cost of order varied by cuisine
- Median cost of order for French and Thai food was the highest
- Korean & Mediterranean had the most outliers for the cost of order

Observations:

- Median food prep time for Italian and Thai was the highest
- Many restaurants had a median food prep time between 26 – 28 mins.
- Korean had the most outliers for food prep time

Exploratory Data Analysis: Multivariate



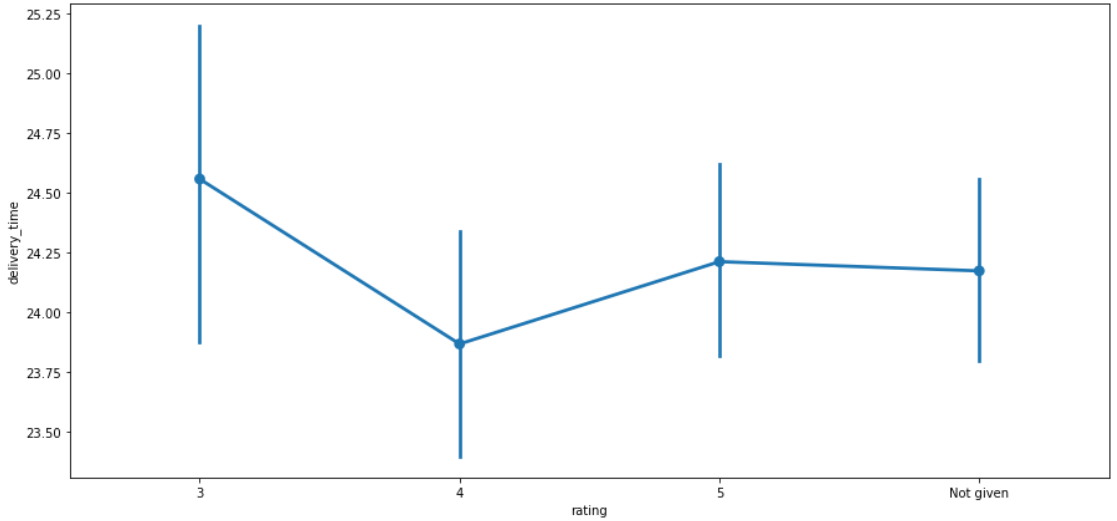
Observations:

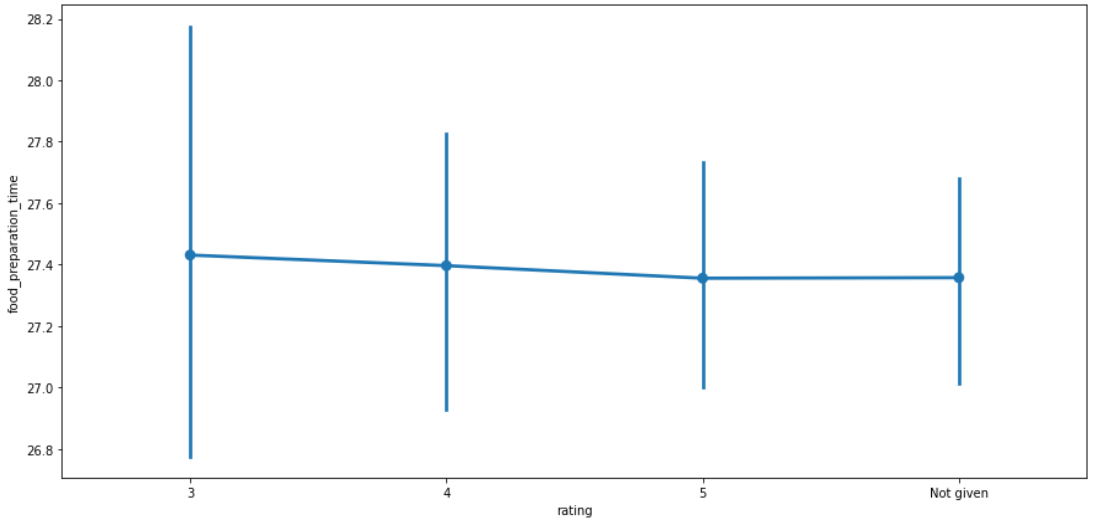
- Delivery times during the weekday (slight) and weekend are right skewed
- Delivery times during the week are longer than on the weekends

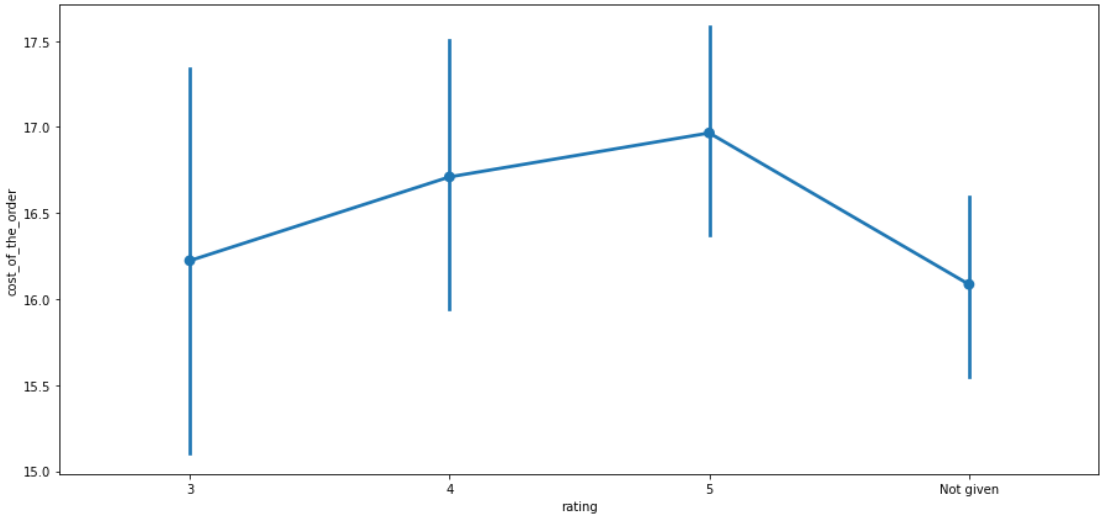
Top 10 Restaurants (By Revenue)

Restaurant	Revenue
Shake Shack	$3,579.53
The Meatball Shop	$2,145.21
Blue Ribbon Sushi	$1,903.95
Blue Ribbon Fried Chicken	$1,662.29
Parm	$1,112.76
RedFarm Broadway	$ 965.13
RedFarm Hudson	$ 921.21
TAO	$ 834.50
Han Dynasty	$ 755.29
Blue Ribbon Sushi Bar & Grill	$ 666.62

Exploratory Data Analysis: Multivariate



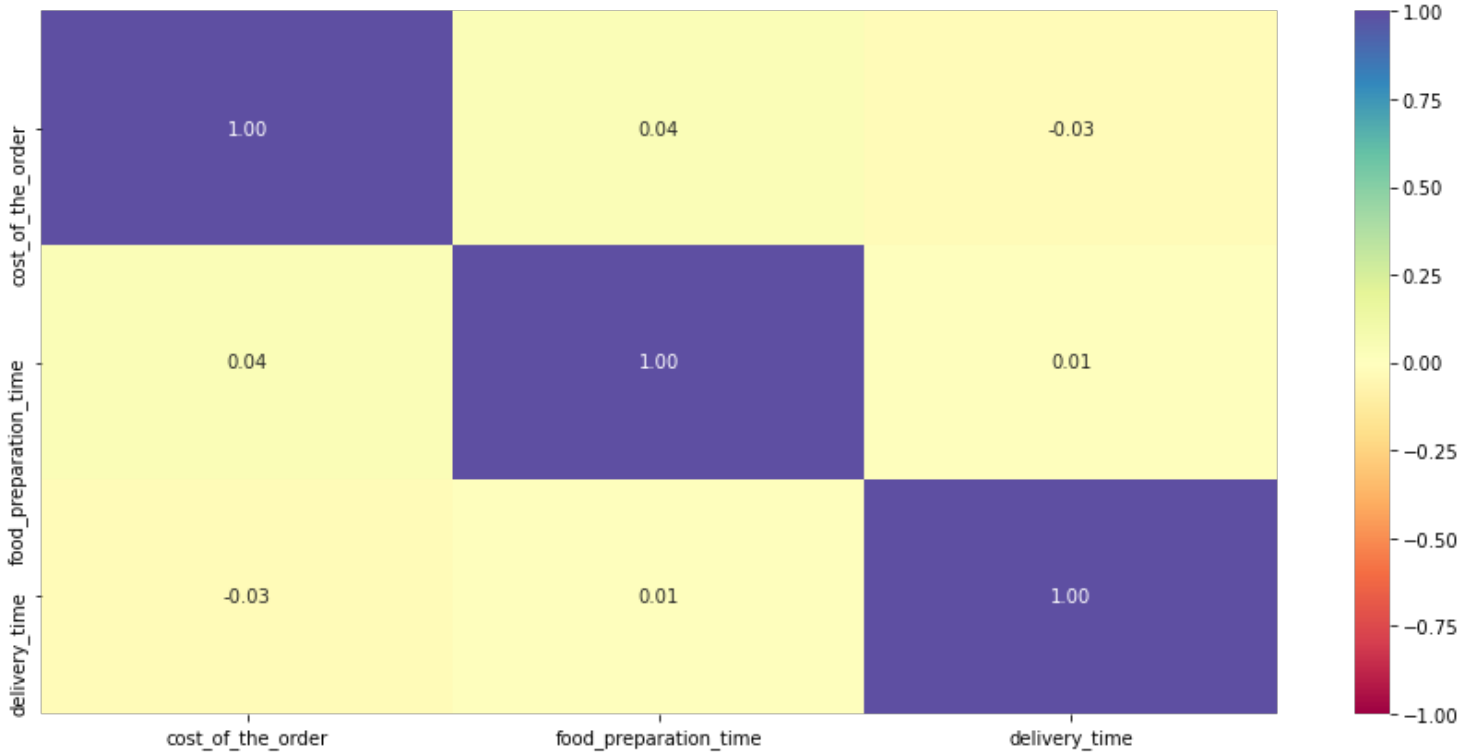




Observations:

- Average ratings increased with shorter delivery times
- Average ratings increased with the cost of the order
- Not much difference in ratings when food preparation was a factor

Exploratory Data Analysis: Multivariate



Observations:

- No strong correlation amongst variables seen
- Cost of the order vs. food prep time had the highest correlation amongst variables

Restaurants with the Most Ratings
(Rating greater than 4 and 50+ ratings)

Restaurant	Number of Ratings
Shake Shack	133
The Meatball Shop	84
Blue Ribbon Sushi	73
Blue Ribbon Fried Chicken	64
RedFarm Broadway	41

Restaurants with the Best Average Ratings
(Rating greater than 4 and 50+ ratings)

Restaurant	Number of Ratings
The Meatball Shop	4.511905
Blue Ribbon Fried Chicken	4.328125
Shake Shack	4.278195
Blue Ribbon Sushi	4.219178

Net Revenue Received by Restaurant Across All Orders (Top 10)

Restaurant	Number of Ratings
Shake Shack	$703.60
The Meatball Shop	$419.82
Blue Ribbon Sushi	$360.46
Blue Ribbon Fried Chicken	$340.20
Parm	$218.55
RedFarm Broadway	$191.46
RedFarm Hudson	$180.93
TAO	$167.35
Han Dynasty	$149.39
Rubirosa	$140.80

Note:

- Total net revenue across all orders was $6,166.30

Delivery Time Observations

Delivery Times	*Percentage of orders with more than 60 minutes 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

Conclusions

After all the analysis, we have been able to conclude that:

- American, Japanese, and Italian are the most popular cuisines based upon number of orders received
- Weekends are the most popular times for using the app
- No direct strong correlation identified between variables
- The Shake Shack had the most ratings and The Meatball Shop had the best average ratings
- The Shake Shack and The Meatball Shop generated the most net revenue
- The average delivery time is around 30 minutes for all orders
- The delivery time during the week is longer than on weekends

Recommendations

Based on the analysis, below are recommendations that can help the business grow:

- Provide incentive to restaurants with lower number of orders to offer discounts to increase their orders
- Provide voucher to customers to rate restaurants (38.8% of orders not rated)
- Get qualitive survey feedback from customers that provide a rating less than 3
- Provide voucher to customers to use the app during the week
- Provide incentive to restaurants with food prep time less than 25 minutes
- Assign drivers to pickup at restaurants that are near customer drop off location; ideally 20 minutes or less to decrease delivery time