



FOOD HUB PYTHON PROJECT

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STRUCTURE OF DATA

	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	20
1	1477685	358141	Blue Ribbon Sushi Izakaya	Japanese	12.08	Weekend	Not given	25	23
2	1477070	66393	Cafe Habana	Mexican	12.23	Weekday	5	23	28
3	1477334	106968	Blue Ribbon Fried Chicken	American	29.20	Weekend	3	25	15
4	1478249	76942	Dirty Bird to Go	American	11.59	Weekday	4	25	24

- Shape of Data: 1898 rows, 9 columns

COLUMN DATA TYPES

Data columns (total 9 columns):

#	Column	Non-Null Count	Dtype
0	order_id	1898 non-null	int64
1	customer_id	1898 non-null	int64
2	restaurant_name	1898 non-null	object
3	cuisine_type	1898 non-null	object
4	cost_of_the_order	1898 non-null	float64
5	day_of_the_week	1898 non-null	object
6	rating	1898 non-null	object
7	food_preparation_time	1898 non-null	int64
8	delivery_time	1898 non-null	int64

dtypes: float64(1), int64(4), object(4)

memory usage: 133.6+ KB

Data types include int, float, and object.

OBJECTS TO CATEGORY TYPES

#	Column	Non-Null	Count	Dtype
0	order_id	1898	non-null	int64
1	customer_id	1898	non-null	int64
2	restaurant_name	1898	non-null	category
3	cuisine_type	1898	non-null	category
4	cost_of_the_order	1898	non-null	float64
5	day_of_the_week	1898	non-null	category
6	rating	1898	non-null	object
7	food_preparation_time	1898	non-null	int64
8	delivery_time	1898	non-null	int64

dtypes: category(3), float64(1), int64(4), object(1)
memory usage: 102.7+ KB

The memory usage decreased by approximately 31 KB because of changing object types into category types.

STATISTICAL 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

Average food preparation time is 27, min food preparation time is 20, max food preparation time is 35

ORDER RATINGS

```
Not given    736  
5            588  
4            386  
3            188  
Name: rating, dtype: int64
```

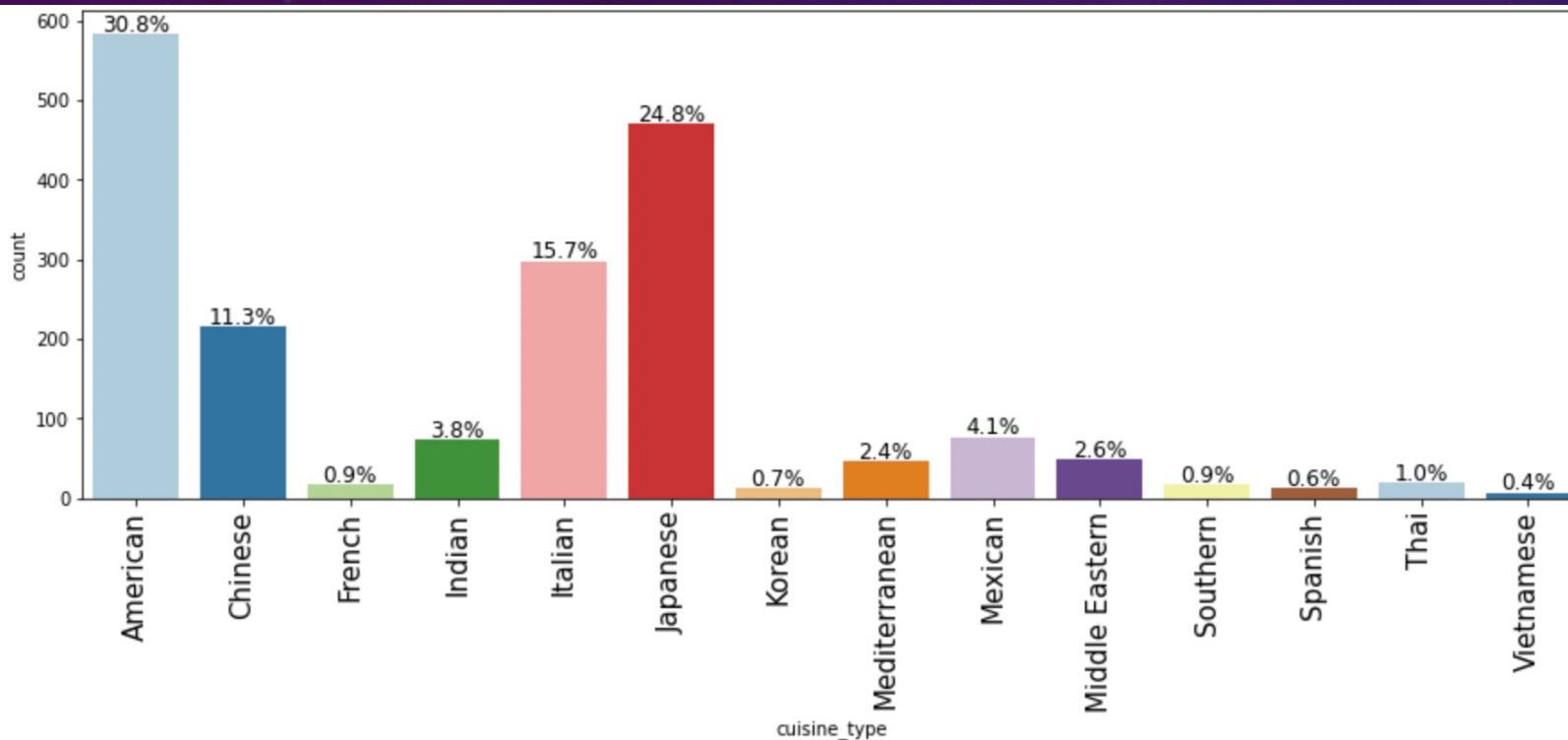
736 orders are not rated.

UNIQUE TYPES OF CUISINES

```
['Korean', 'Japanese', 'Mexican', 'American', 'Indian', ..., 'Thai', 'Southern', 'French', 'Spanish', 'Vietnamese']  
Length: 14  
Categories (14, object): ['Korean', 'Japanese', 'Mexican', 'American', ..., 'Southern', 'French', 'Spanish', 'Vietnamese']
```

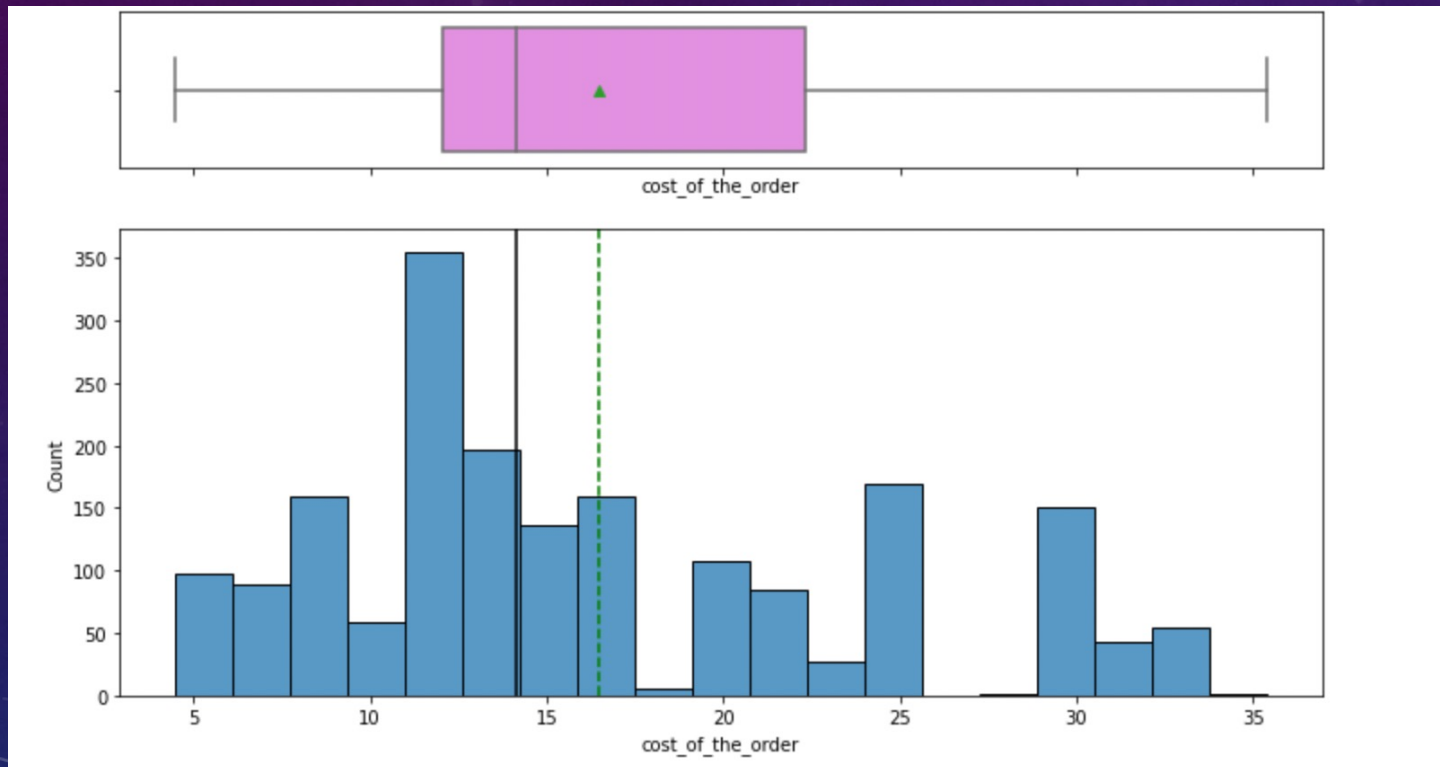
14 unique types of cuisines

CUISINE BAR GRAPH



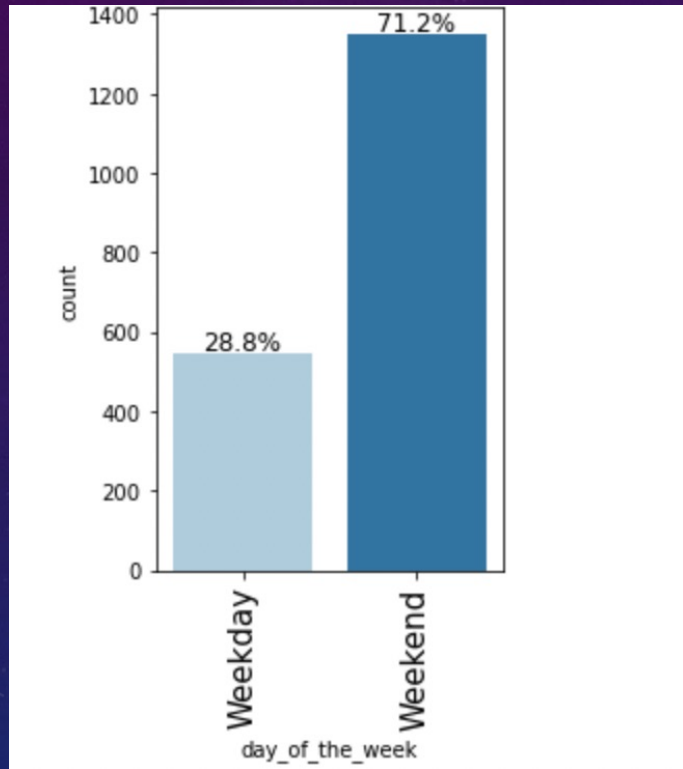
American Cuisine is the most popular type of cuisine. Vietnamese is the least popular cuisine.

HISTOGRAM/BOX PLOT OF COST OF ORDER



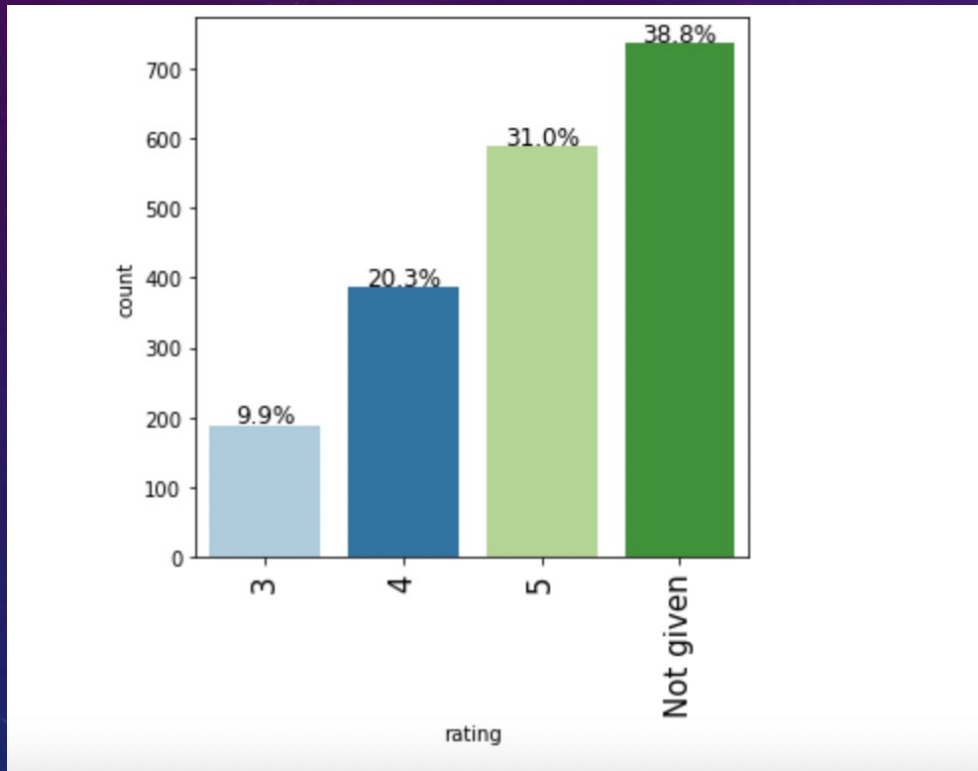
Interquartile range of 12-23. Mean is 16.5 and median is around 14. Range from 4.5 to 35.5.

DAYS OF THE WEEK



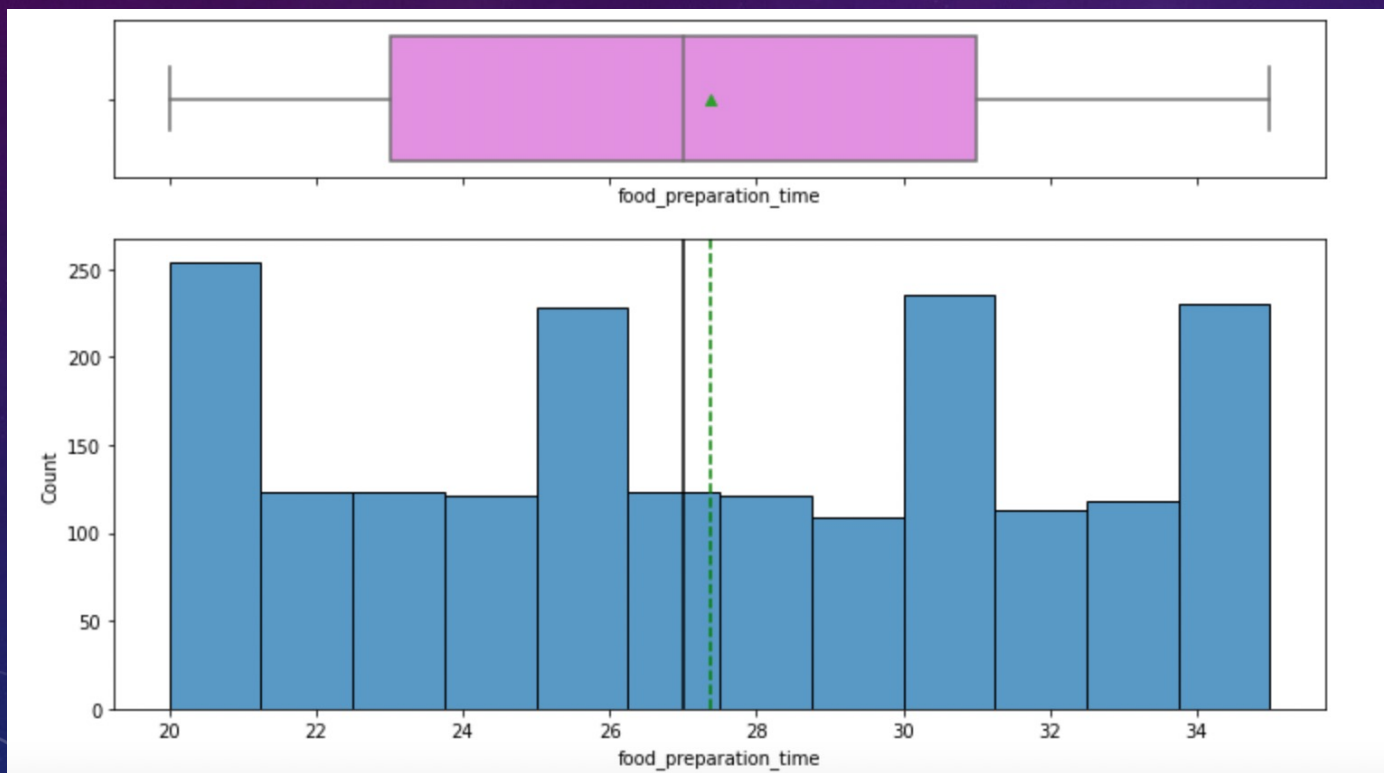
2 Unique Types of Days of the Week: Weekday and Weekend
Weekends have roughly over 42% more order counts than weekdays.

RATINGS



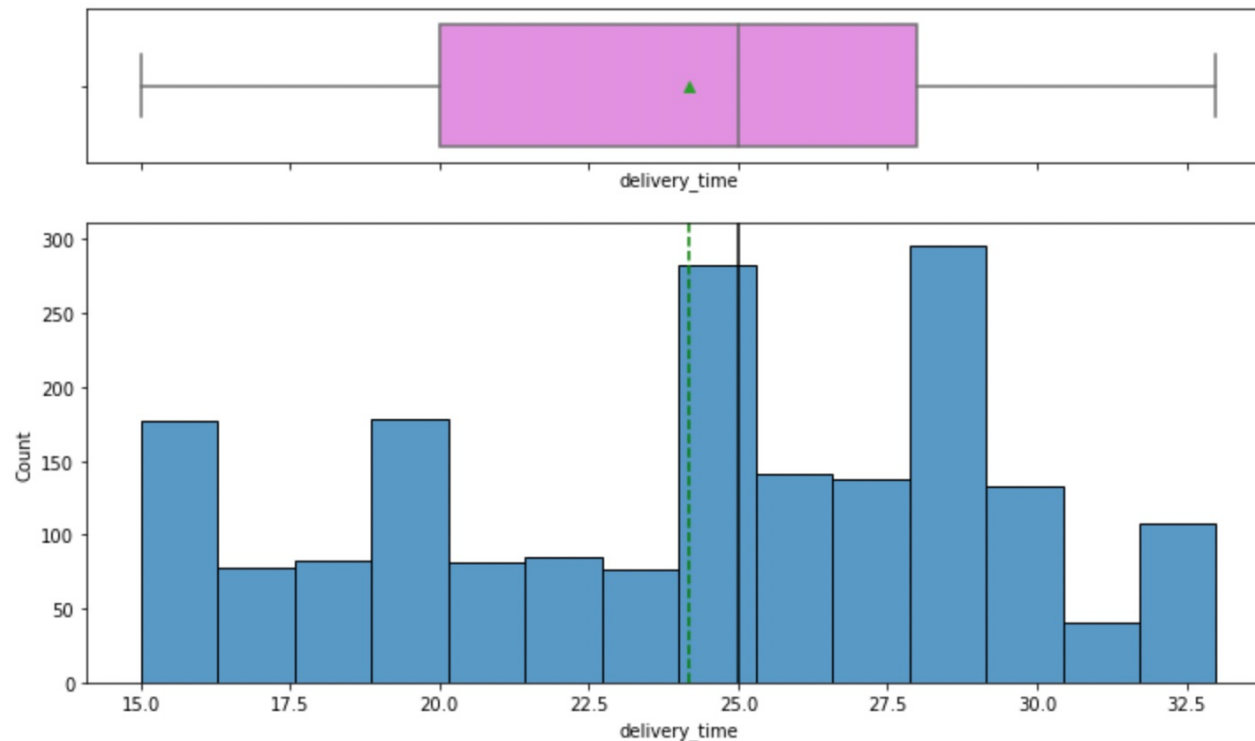
4 Unique Types of Ratings: 3, 4, 5, Not Given
Most ratings are “Not Given” and least number of ratings are “3”.

FOOD PREPARATION TIME HISTOGRAM AND BOX PLOT



Interquartile range of 23-31. Mean is 27.37 and median is 27. Range from 20 to 35.

DELIVERY TIME HISTOGRAM AND BOX PLOT



Interquartile range of 20-28.
Mean is 24.16 and median is 25. Range from 15 to 33.

TOP 5 RESTAURANTS IN ORDERS RECEIVED

```
Shake Shack                219
The Meatball Shop          132
Blue Ribbon Sushi          119
Blue Ribbon Fried Chicken   96
Parm                        68
...
Klong                       1
Kambi Ramen House          1
Il Bambino                  1
Hunan Manor                 1
Lamarca Pasta               1
Name: restaurant_name, Length: 178, dtype: int64
```

Top 5 Restaurants in Orders Received:
Shake Shack, The Meatball Shop, Blue
Ribbon Sushi, Blue Ribbon Fried Chicken,
Parm

ORDERS ABOVE 20 DOLLARS/MEAN DELIVERY TIME

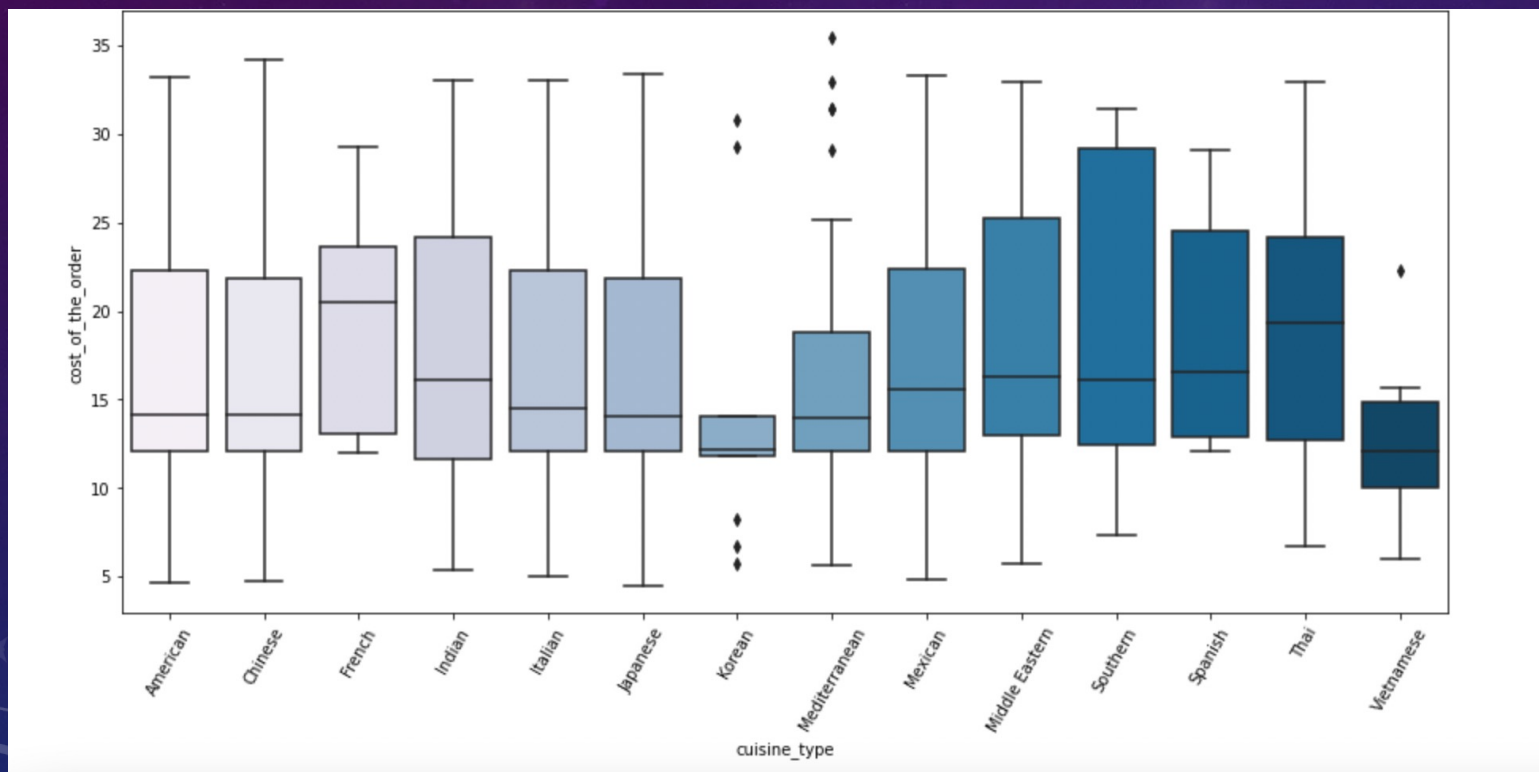
- Number of Total Orders that cost above 20 dollars is 555.
- Percentage of orders above 20 dollars: 29.24%
- Mean Delivery Time for dataset is 24.16 minutes.

20% DISCOUNT VOUCHERS

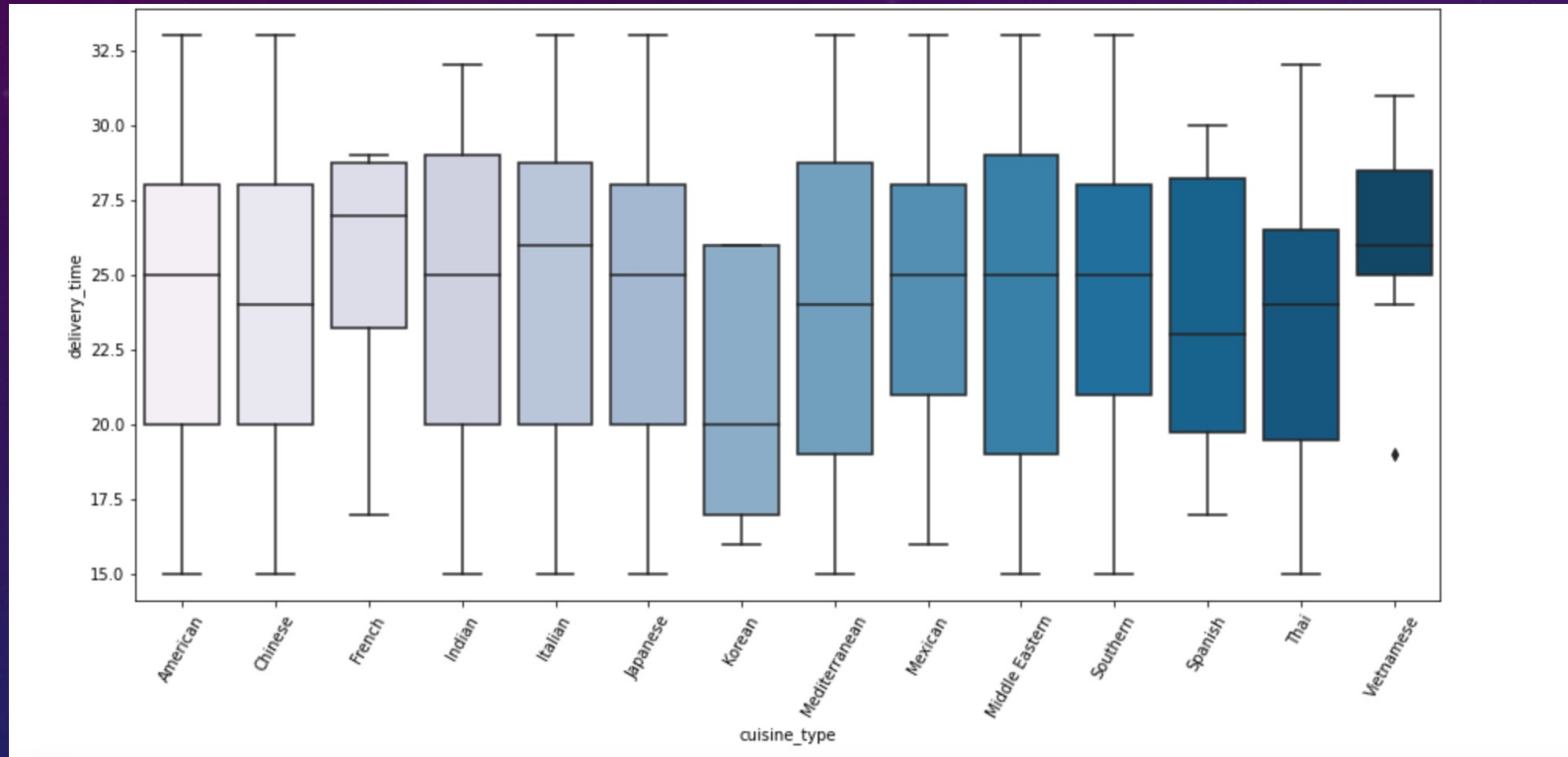
```
52832      13
47440      10
83287       9
250494      8
65009       7
Name: customer_id, dtype: int64
```

The following top 5 customers with these IDs have placed greatest number of orders so they'll get 20% discount vouchers.

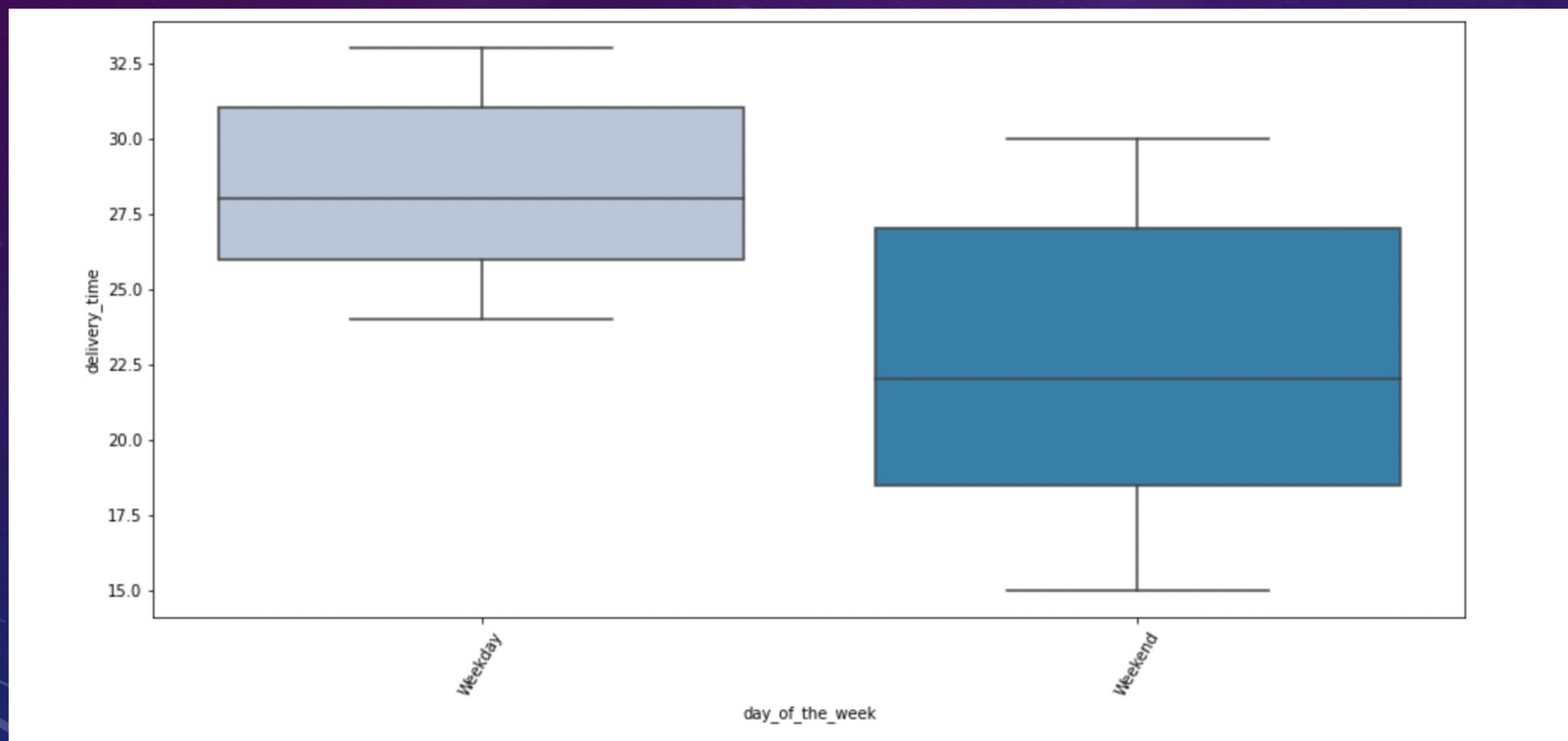
CUISINE VS. COST OF THE ORDER BOX PLOT



CUISINE VS FOOD PREPARATION TIME BOX PLOT



DAY OF THE WEEK VS. DELIVERY TIME BOX PLOT

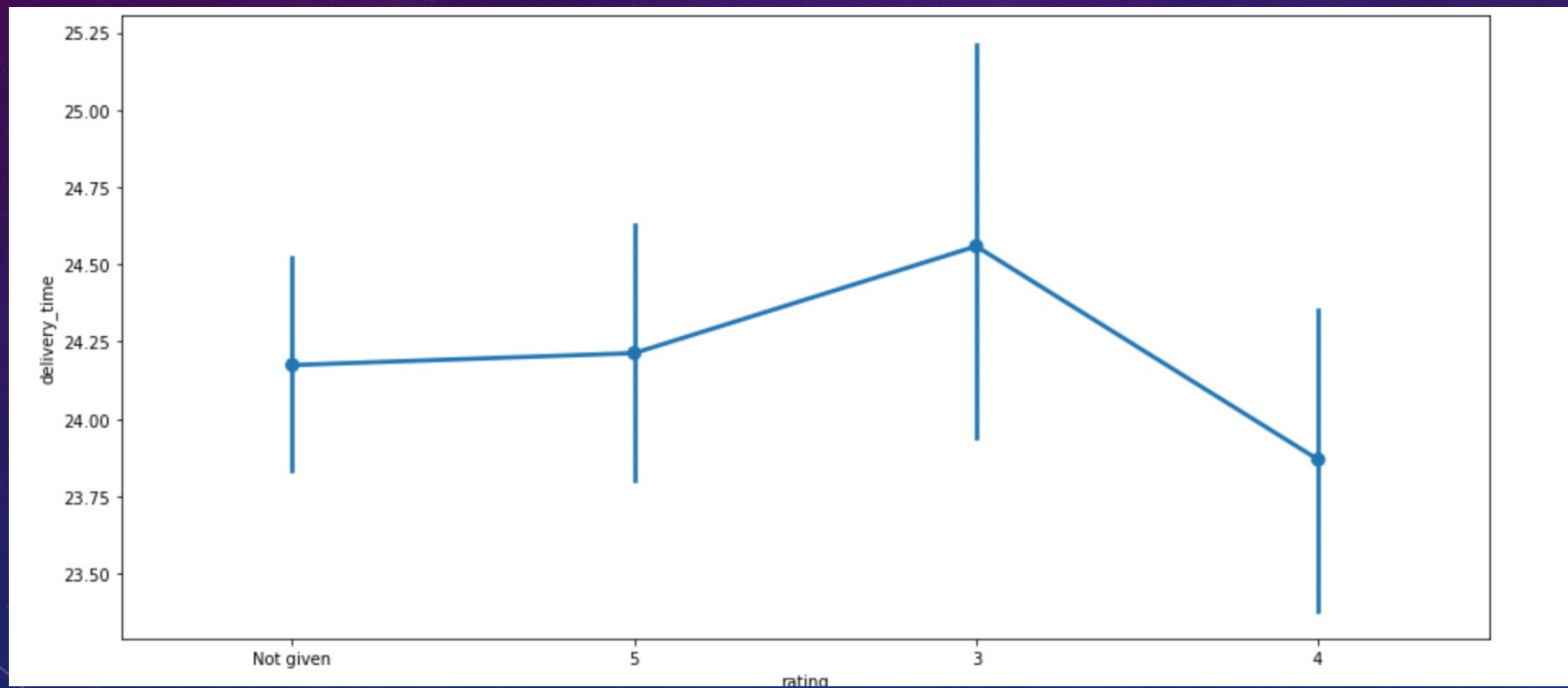


RESTAURANT REVENUES

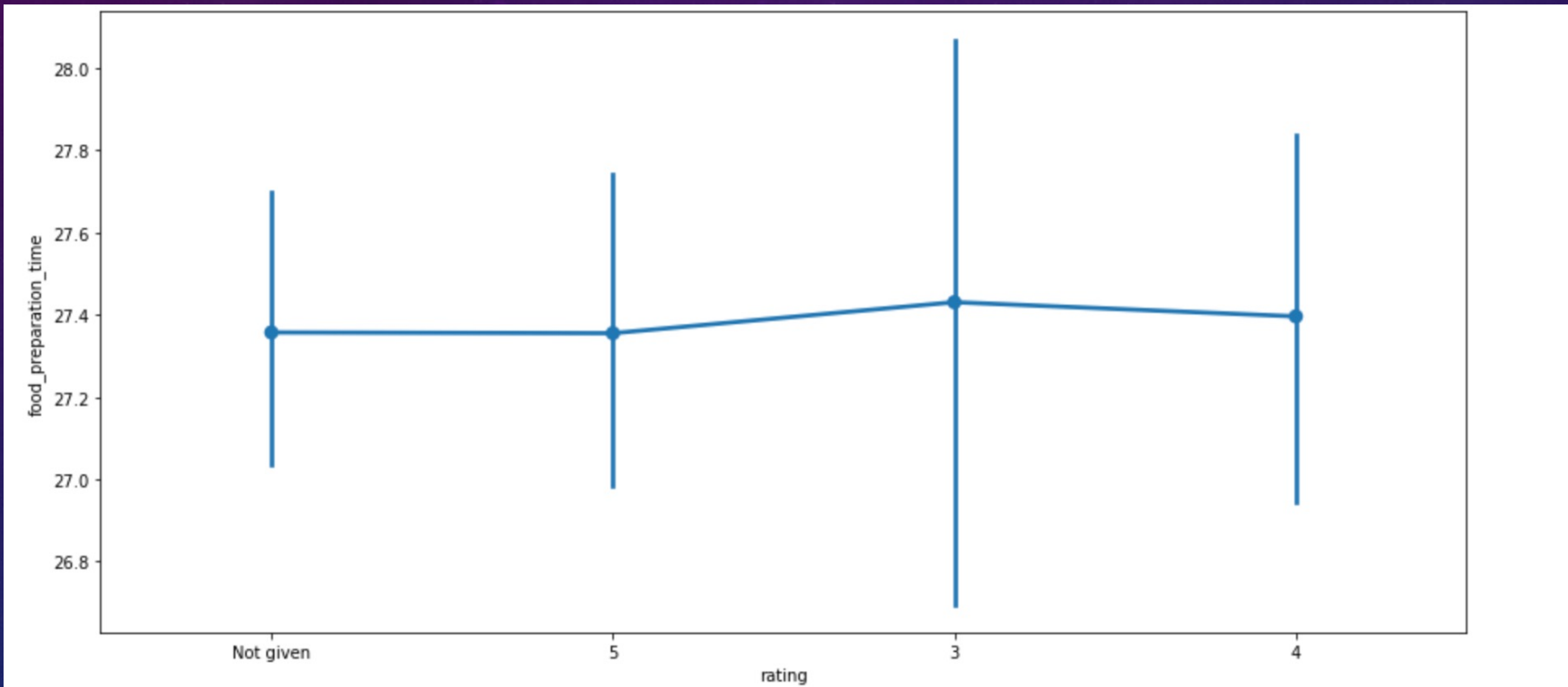
```
restaurant_name
Shake Shack          3579.53
The Meatball Shop    2145.21
Blue Ribbon Sushi    1903.95
Blue Ribbon Fried Chicken 1662.29
Parm                 1112.76
RedFarm Broadway     965.13
RedFarm Hudson       921.21
TAO                  834.50
Han Dynasty          755.29
Blue Ribbon Sushi Bar & Grill 666.62
Rubirosa             660.45
Sushi of Gari 46     640.87
Nobu Next Door       623.67
Five Guys Burgers and Fries 506.47
Name: cost_of_the_order, dtype: float64
```

Shake Shack makes the most revenue compared to all the restaurants. Many orders were made in the restaurants, in which there's a correlation with the more orders, the greater the revenue.

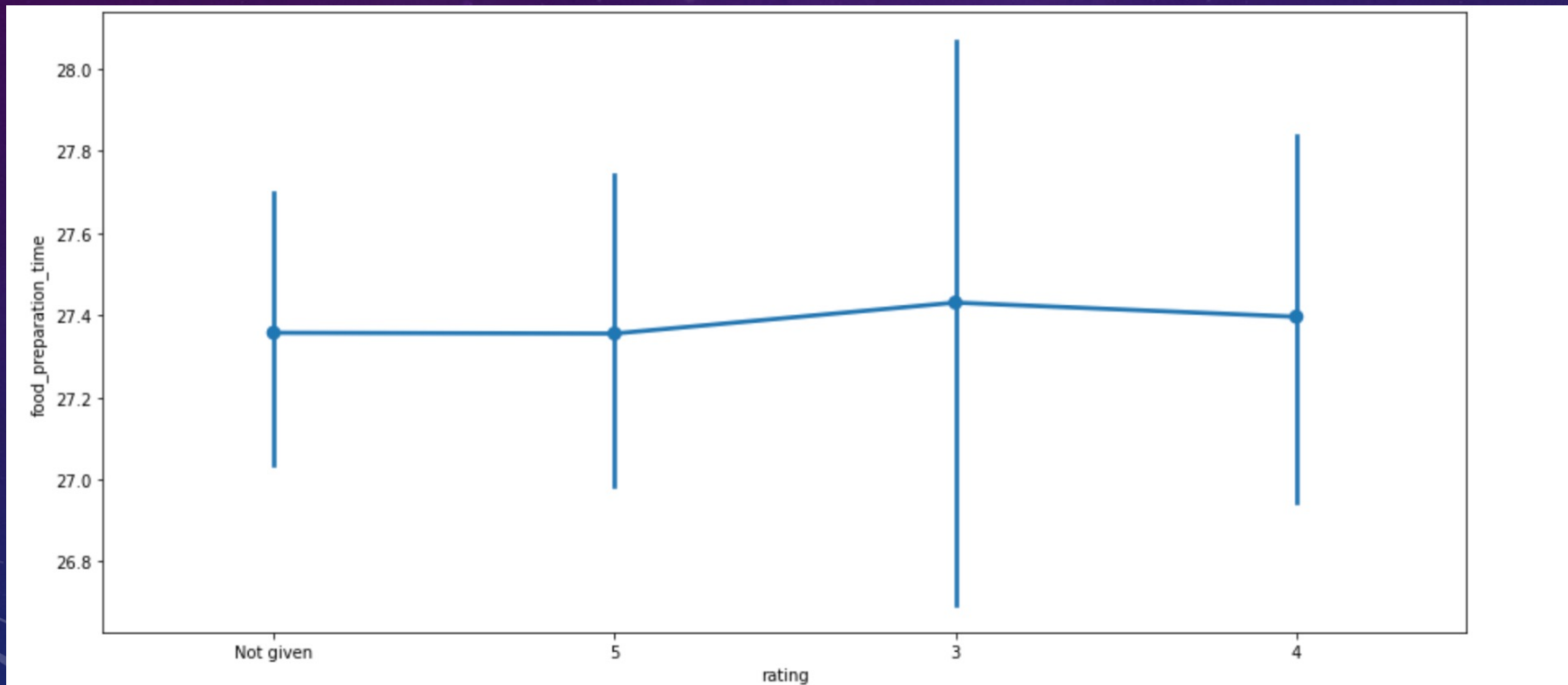
RATING VS. DELIVERY TIME POINT PLOT



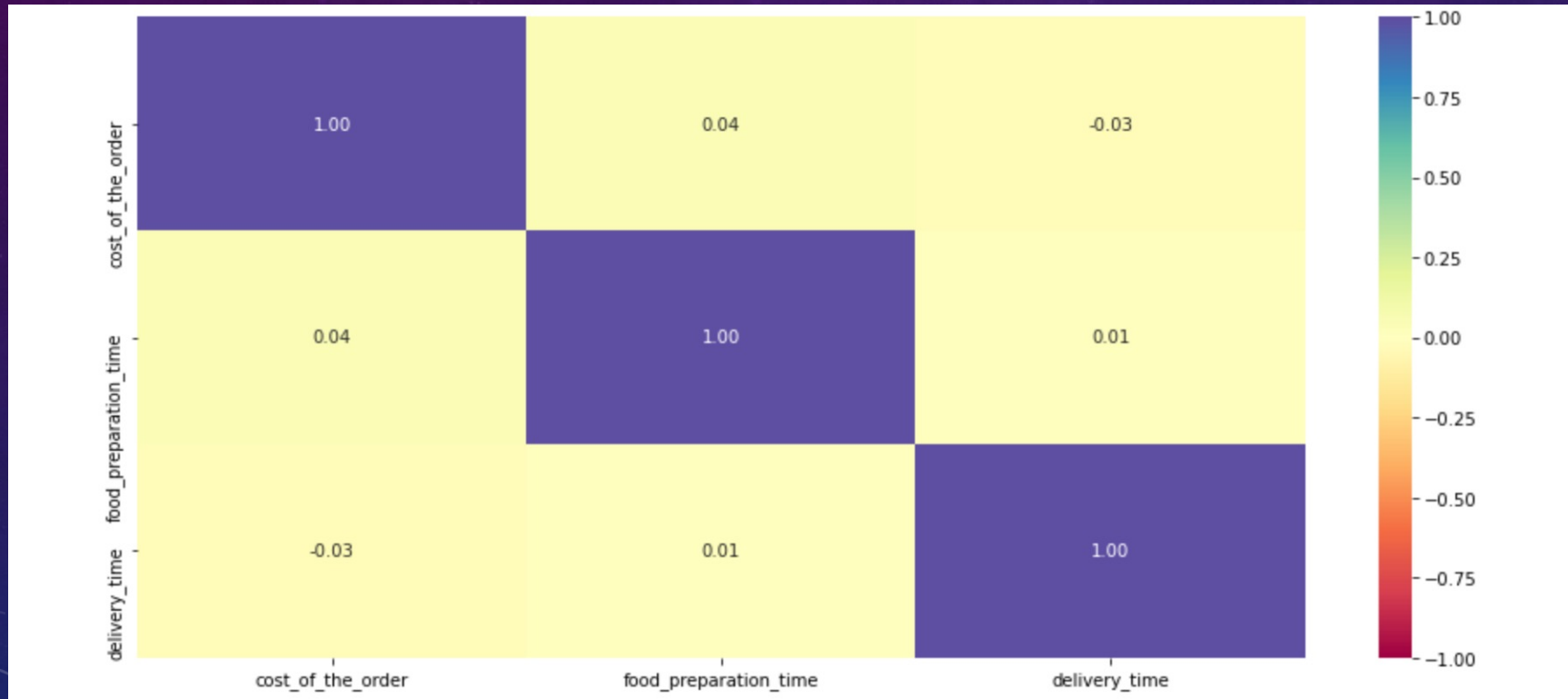
RATING VS. FOOD PREPARATION TIME POINT PLOT



RATING VS. FOOD PREPARATION TIME POINT PLOT



FOOD HUB CORRELATION HEAT MAP



RESTAURANTS PROMOTIONAL OFFER DATAFRAME

	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

The 4 restaurants have more than 50 ratings and have an average rating of more than 4 stars. Restaurant names that should be able to receive promotion are as follows: Blue Ribbon Fried Chicken, Blue Ribbon Sushi, Shake Shack, and The Meatball Shop. They fulfill the criteria to get a promotional offer.

NET REVENUE/TOTAL TIME TO DELIVER FOOD

- If company charges restaurant 25% on orders having cost $> \$20$ and 15% on orders having 5 dollars, the net revenue generated by the company across all orders is \$6166.40.
- Percentage of Orders that take more than 60 minutes to get delivered from time order is placed is around 30.4%.

CONCLUSIONS

Some conclusions from my analysis are as follows:

- American cuisine is the popular cuisine based on the number of orders with Shake Shack being the most popular restaurant for orders and number of ratings, while The Meatball Shop is the highest rated restaurant.*
- More people tend to eat on weekends than weekdays since weekends have a shorter average delivery time.*
- 5 star ratings are the most popular ratings. However, the majority of restaurants don't have a rating.*
- The average times it takes to prepare and deliver the food don't have much of a significant difference. Each of its interquartile ranges have a difference of 3 from its upper and lower ranges.*
- When analyzing box plots, French cuisine has the largest average delivery time and cost of order. American and Chinese cuisines have the largest range in these factors, while Korean and Vietnamese cuisine have the shortest. Mediterranean cuisine has multiple upper outliers in its cost of order.*
- Lower rated restaurants have longest delivery time, longest food preparation time, and lowest cost of order.*
- According to heatmap, a positive correlation exists among food prep time/delivery time, food prep time/cost of order, but negative correlation among delivery time/cost of order.*
- Cost of order was \$16.50 on average, while roughly 30% of orders were above \$20.*

RECOMMENDED ACTIONS/BENEFITS

- *Improve the business by having a wide range of order costs for food that cuisines such as Korean and Vietnamese could implement, thus potentially increasing the number of ratings for the restaurants and the rating value.*
- *Improve delivery time on weekdays for more cuisine orders to be processed.*
- *Improve the delivery and food preparation time and increase cost of order for ratings to boost up.*