FoodHub Data Analysis

Project #1 AIML

Matthew Clark - March 8, 2024

Contents / Agenda

- Executive Summary
- Business Problem Overview and Solution Approach
- Data Overview
- EDA - Univariate Analysis
- EDA - Multivariate Analysis
- Appendix

Executive Summary

FoodHub provides access to many restaurants through a smart phone app where orders are placed, prepared at a partner restautant, and then delivered by a FoodHub delivery person. FoodHub wants to improve their customer experience in order to keep up with a growing number of competitiors.

To achieve this goal FoodHub is committed to analyzing internal data to better understand their customers current satisfaction and how that relates to various metrics in the order, preperation, and delivery process. This report provides analysis of many different variables found in the FoodHub data. We looked at the types of cuisines offered, the number of restaurants, the cost of orders, food preperation times, delivery times, and ratings.

What the data revealed is that the customer experience may be improved with several recommended actions, including fast weekday delivery times, and incentives to increase user feedback and expand revenue with orders from more of the unique cusines offered on the FoodHub platform. It also shows customers and restaurant partners that are eligible for rewards and promotional offers.

Executive Summary

- Conclusions:
  - 90% of orders are completed in less than 20 minutes
  - The cost of orders is consistent among all cuisine types
  - Weekday delivery times are significantly longer than weekend delivery times
  - Many users are not rating their orders
  - Lower ratings are not driven by order cost, food preparations times, or delivery times
  - American, Japanese, Italian, and Chinese cuisines make up 75% of the orders placed and are the favorite cuisines on the weekends
- Recommendations:
  - Find ways to add weekday delivery drivers to improve weekday delivery times.
  - Find ways to incentivise customers to rate their orders, for example a small discount on future orders
  - More ratings would provide more detailed correlations between satisfaction and cuisine types
  - Determine if lower ratings are a result of food quality
  - Create a promotion to encourage users to try different cuisines

Business Problem Overview and Solution Approach

- FoodHub, a food aggregator company, is rapidly facing increased competition. The company seeks to improve their customer experience by using data to better understand the demand for different restaurants and provide promotions for theirs frequent orderers and restaurant partners.
- FoodHub provided the dataset from different orders captured by registered customers in the online portal. The dataset was analyzed using Python with Pandas and Numpy libraries for data manipulation. The visualizations were created using Seaborn and MadPlotLib libraries.

Data Overview

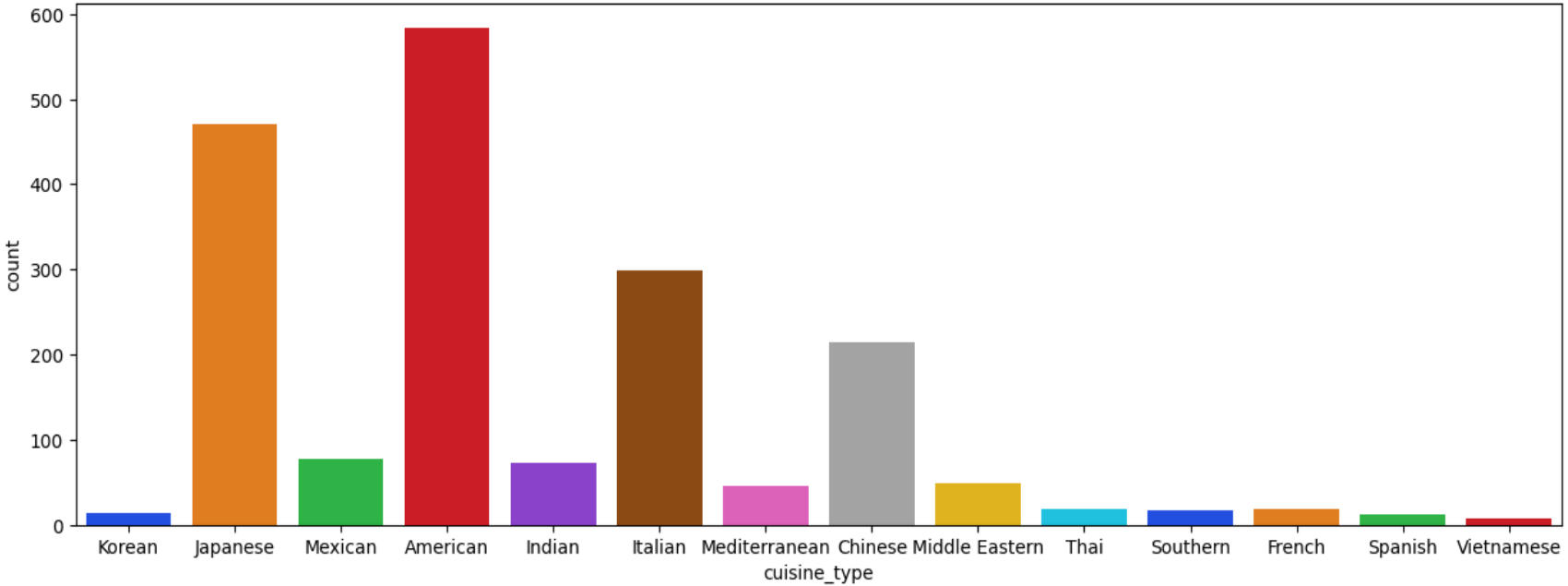
- The data contains information related to food orders and deliveries
- Data Dictionary:
    - **order_id**: Unique ID of the order
    - **customer_id**: ID of the customer who ordered the food
    - **restaurant_name**: Name of the restaurant
    - **cuisine_type**: Cuisine ordered by the customer
    - **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

- The dataset contains 1898 rows and 9 columns
- The datatypes in the different columns are integer, float, and string
- The data has no missing values
- The data shows that for food preparation times the minimum time is 20, the average time is 27.4, and the maximum time is 35
- The data shows that 736 orders were not given a rating
- There are 1898 unique order ID
- There are 1200 unique customer ID
- There are 178 restaurant names

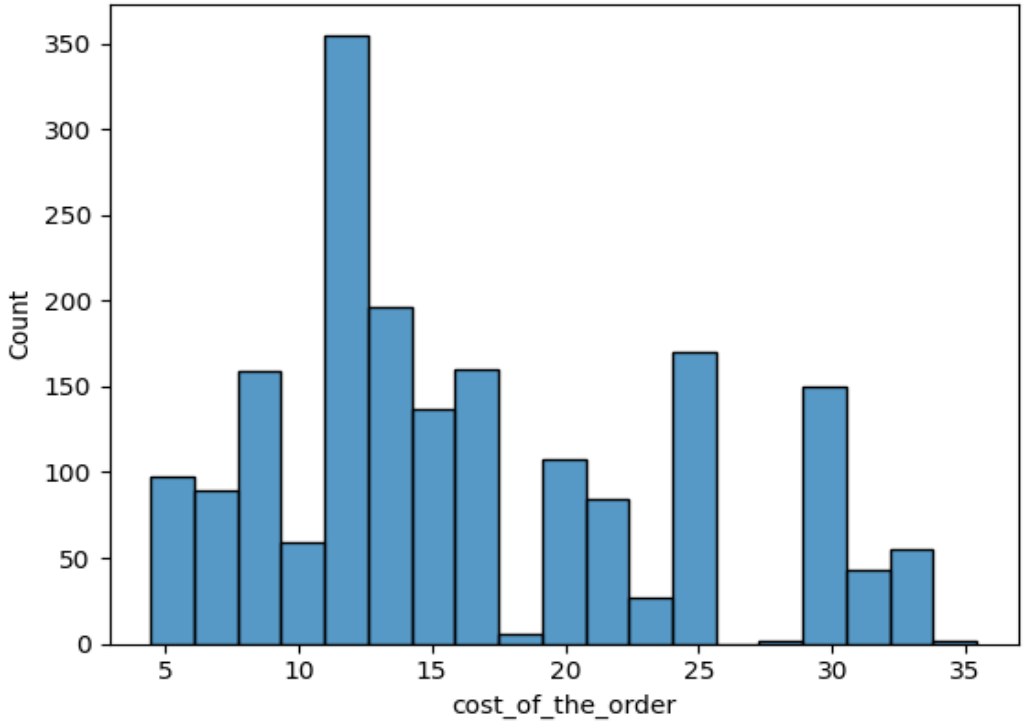
Cuisine Types

- There are 14 different unique cuisine types



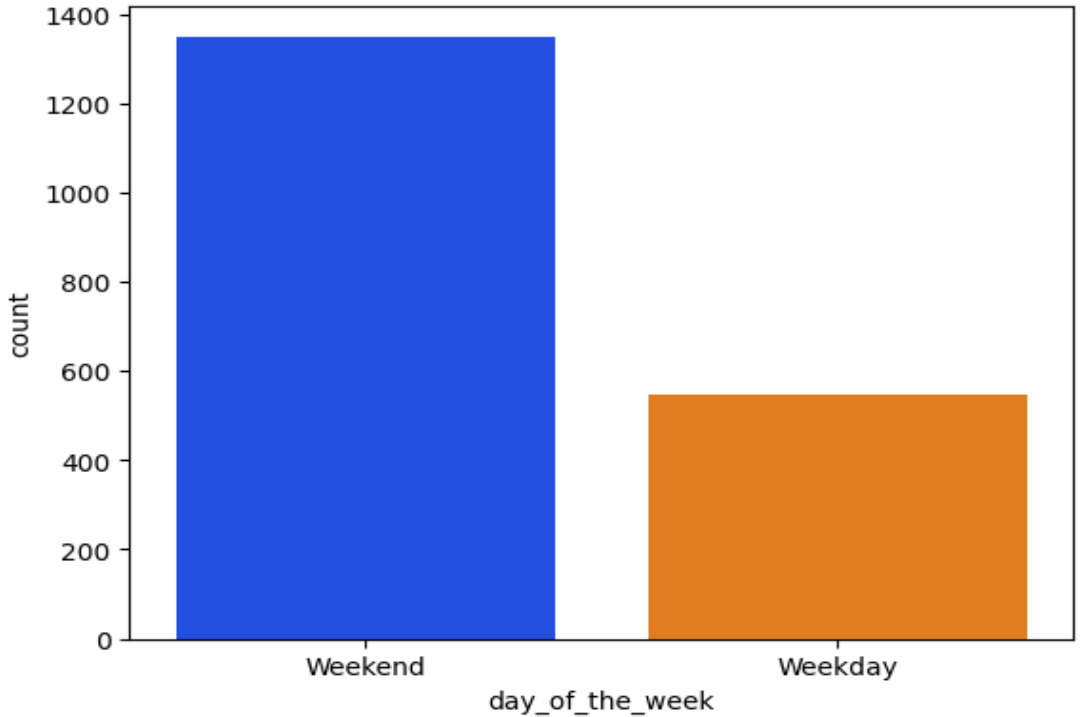
Order Costs

- Most orders cost less than $20



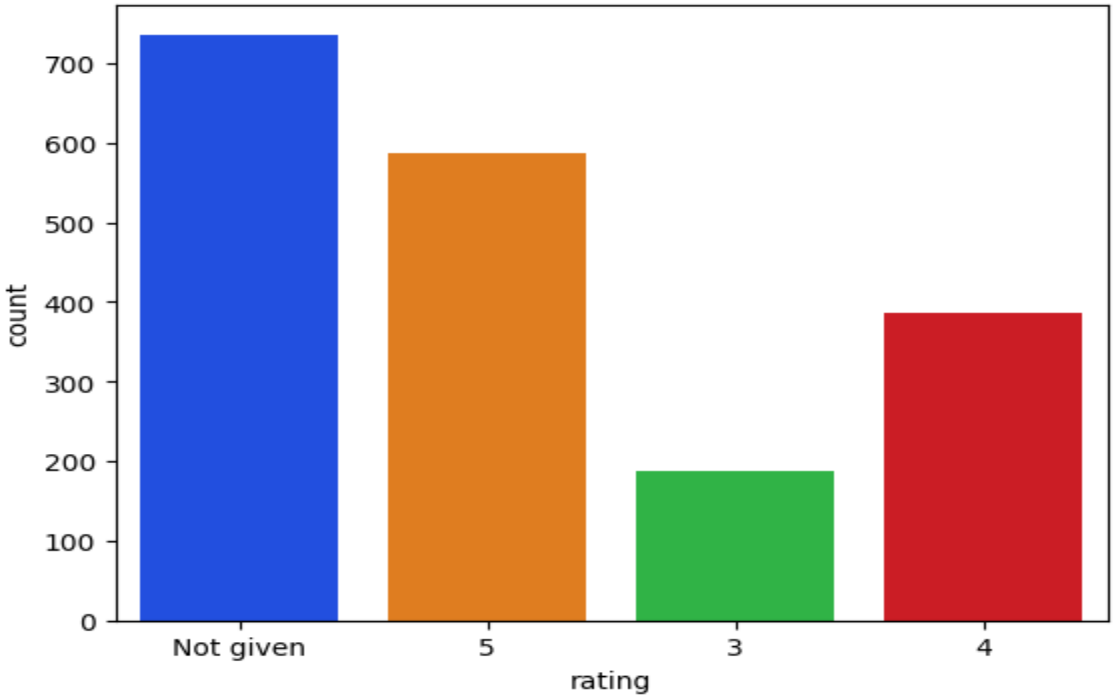
Days of the Week

- Roughly two thirds of orders were placed on the weekend



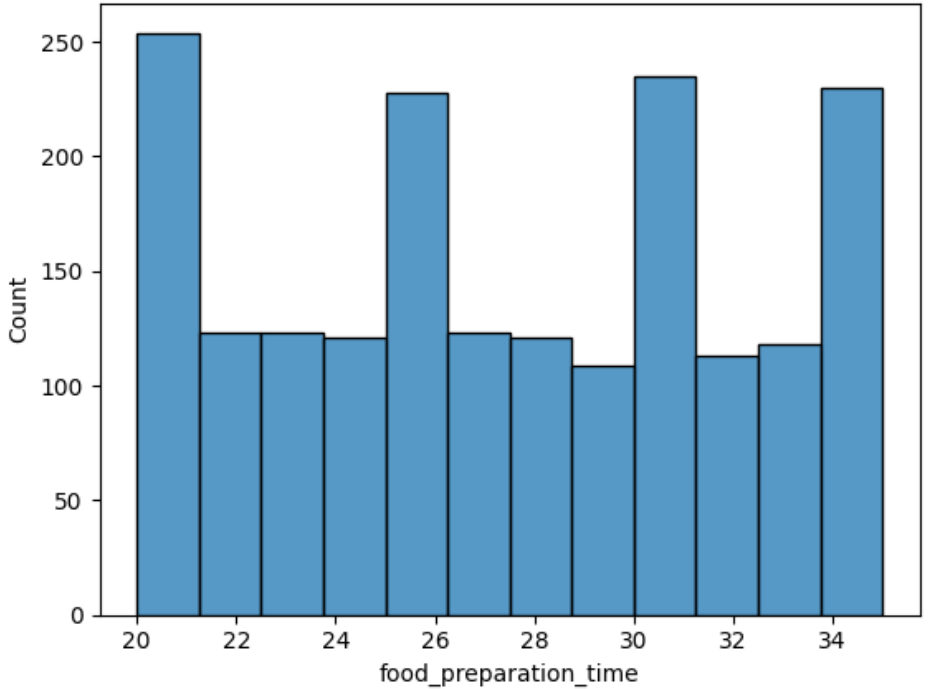
Ratings

- Many customers do not provide ratings
- Of those customers that do rate, more than half rate a 4 or 5



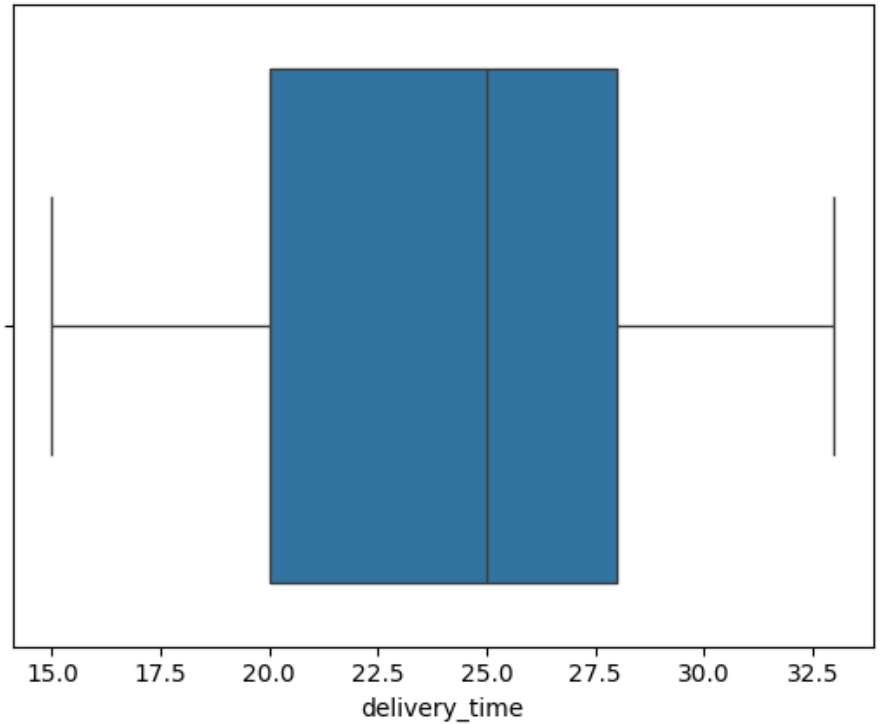
Food Preparation Times

- Half of all food is prepared within 23 and 31 minutes.



Delivery Times

- 75% of deliveries are completed in under 30 minutes
- The mean delivery time for this dataset is 24.16 minutes.



Top 5 Restaurants

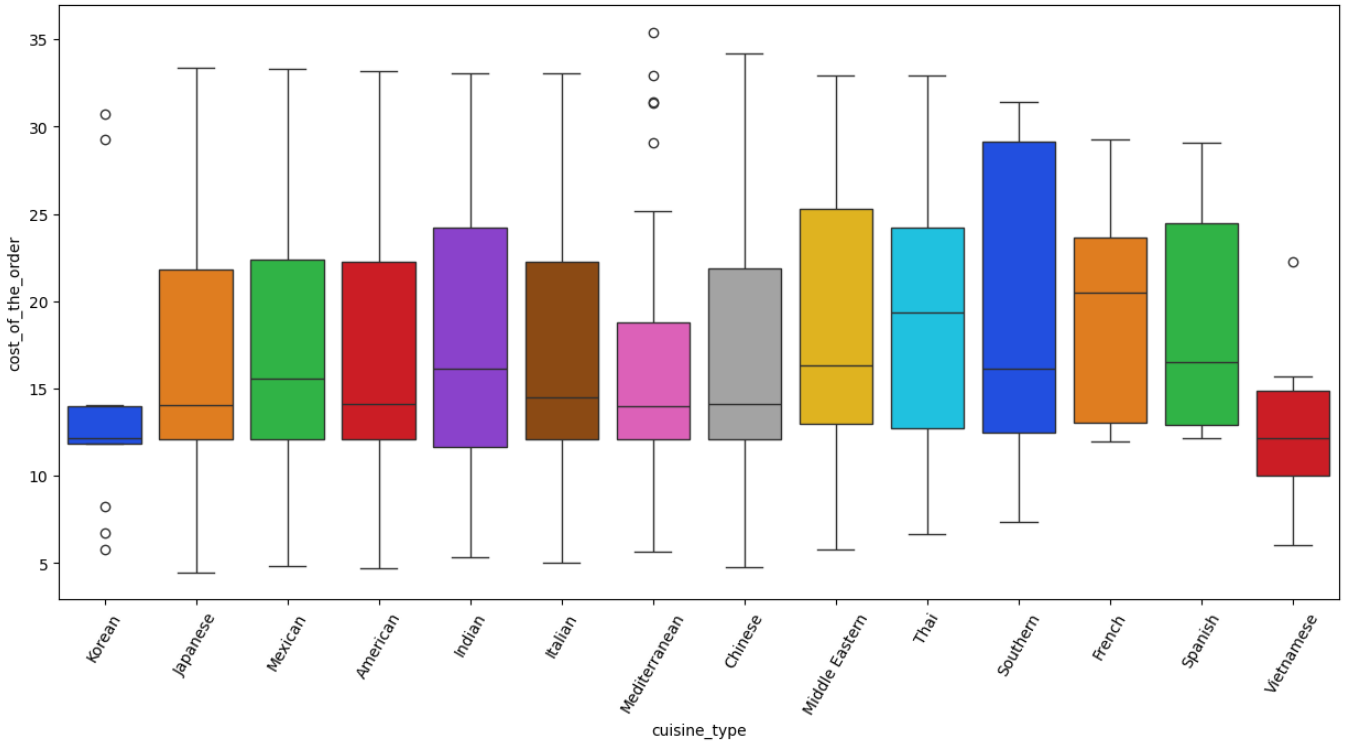
- Based on the number of orders received these are the top 5 restaurants
  - Shake Shack 219 orders
  - The Meatball Shop 132 orders
  - Blue Ribbon Sushi 119 orders
  - Blue Ribbon Fried Chicken 96 orders
  - Parm 68 orders

Most Popular Weekend Cuisines

- These are the top 5 most popular cuisines on the weekend:
  - American 415 orders
  - Japanese 335 orders
  - Italian 207 orders
  - Chinese 163 orders
  - Mexican 53 orders

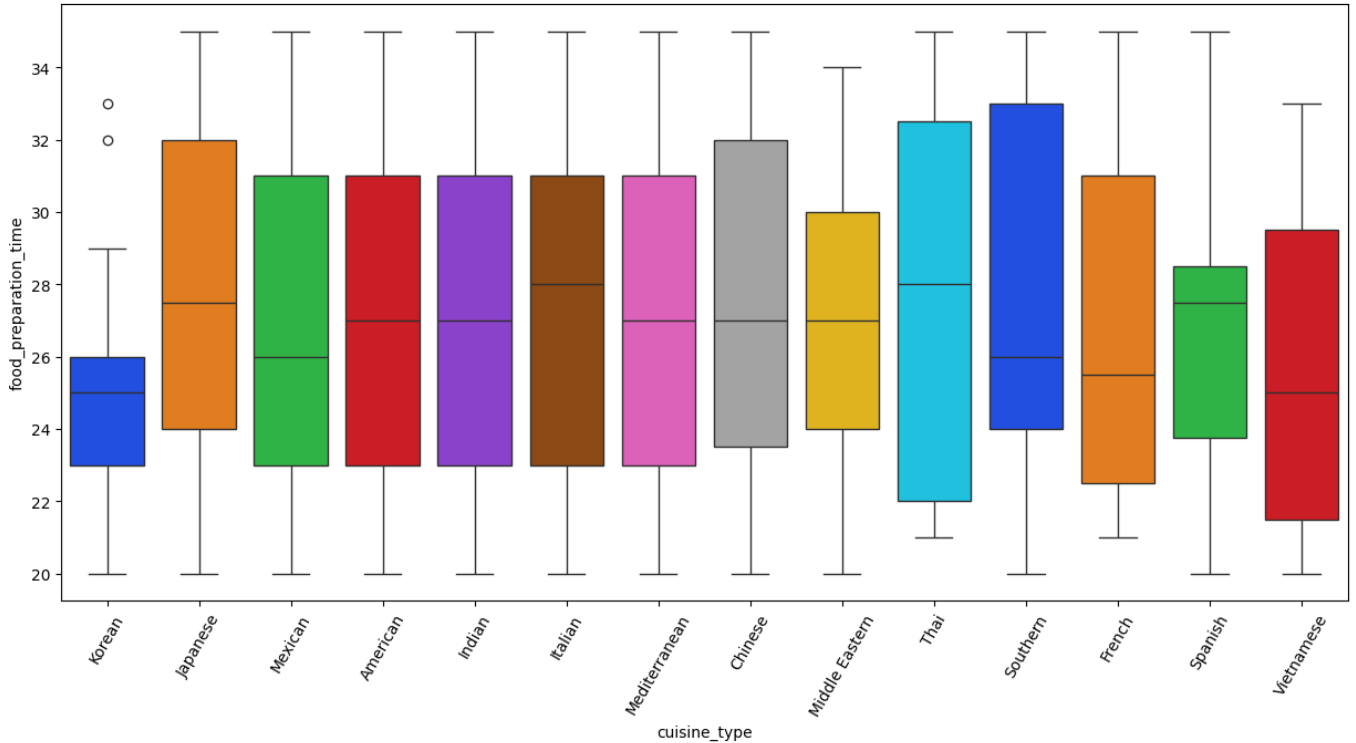
Cuisine vs. Cost of the Order

- About 50% of orders cost between 12 and 22 dollars across all cuisines
- Korean, Vietnames, and Mediteranean cusines have outliers in the cost of orders



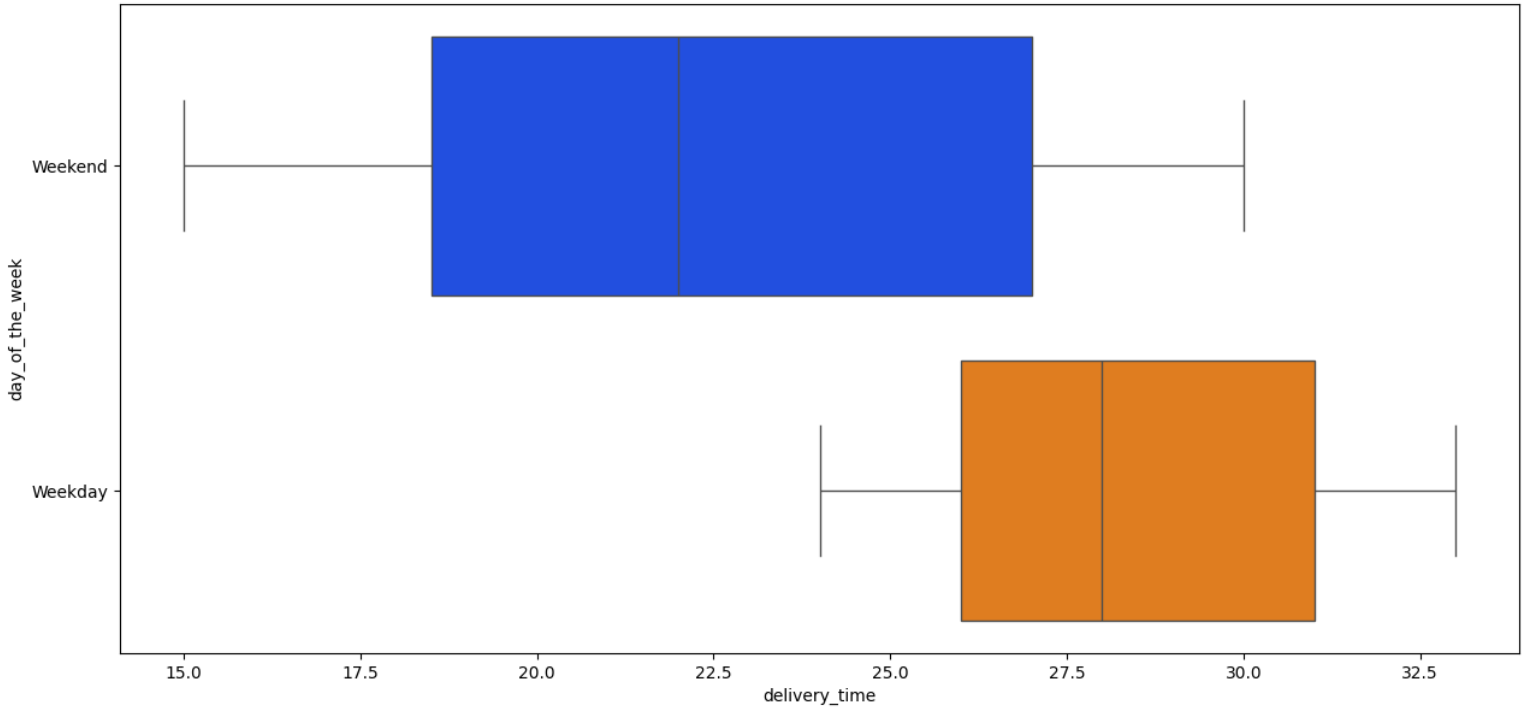
Cuisine vs Food Preparation Time

- Roughly 50% of all cusine types are prepared in 23 to 31 minutes
- Food preperation times are fairly consistent with the exception of Korean cuisine



Days of the Week vs. Delivery Time

- Weekday delivery times are 24 to 33 minutes
- Weekend delivery times are 15 to 30 minutes

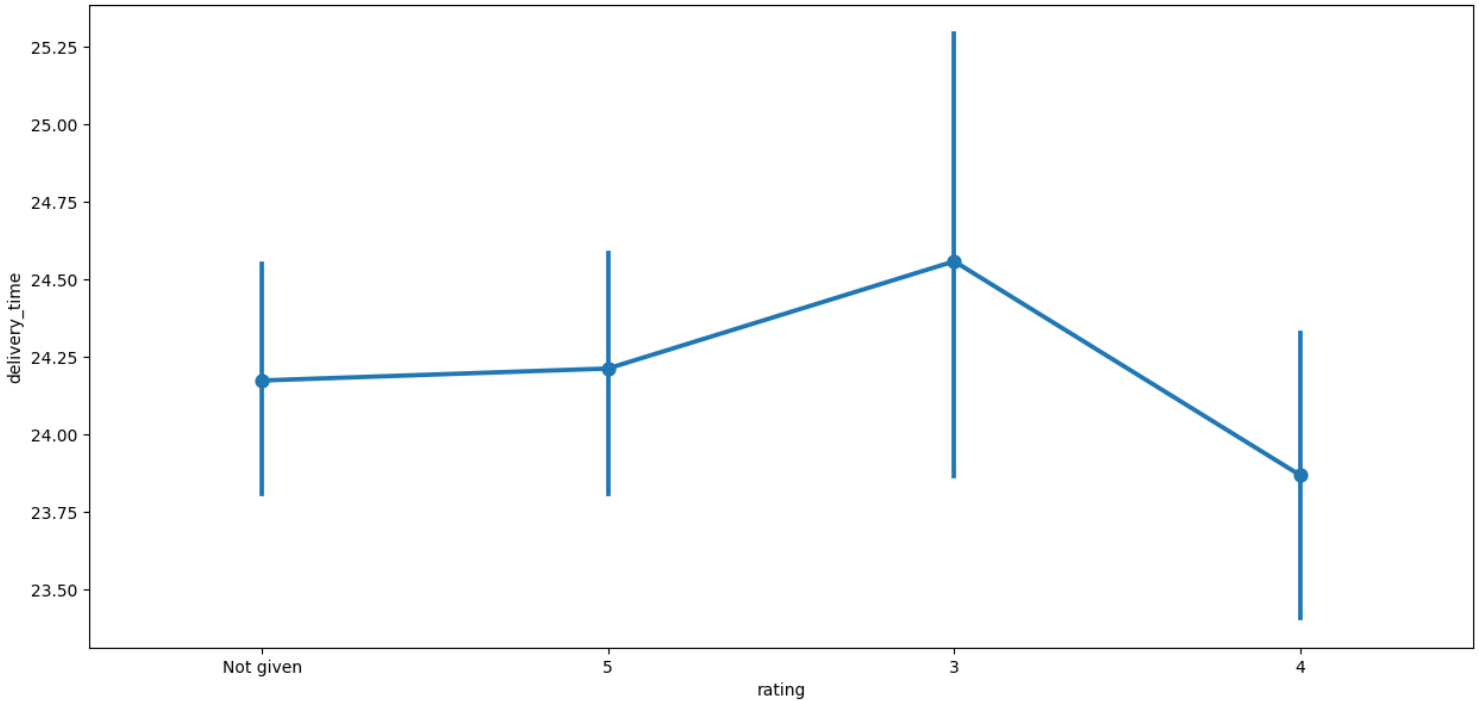


Revenue Generated by Restaurant

- Of the 178 restaurant partners FoodHub has in this dataset, most of the revenue is generated by just a few restaurants.
    - 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

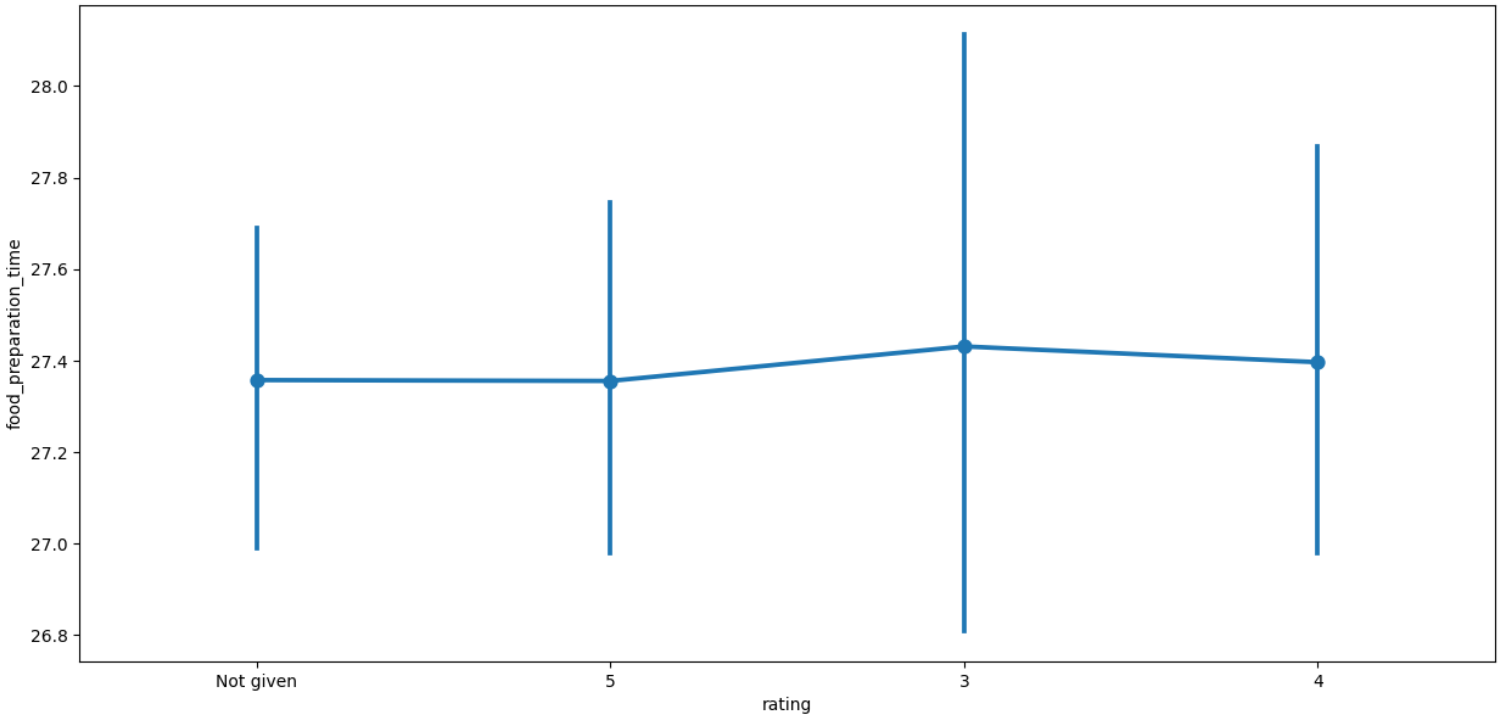
Rating vs. Delivery Time

- Delivery times are slightly higher for the lowest ratings
- Unrated orders have the second lowest delivery time



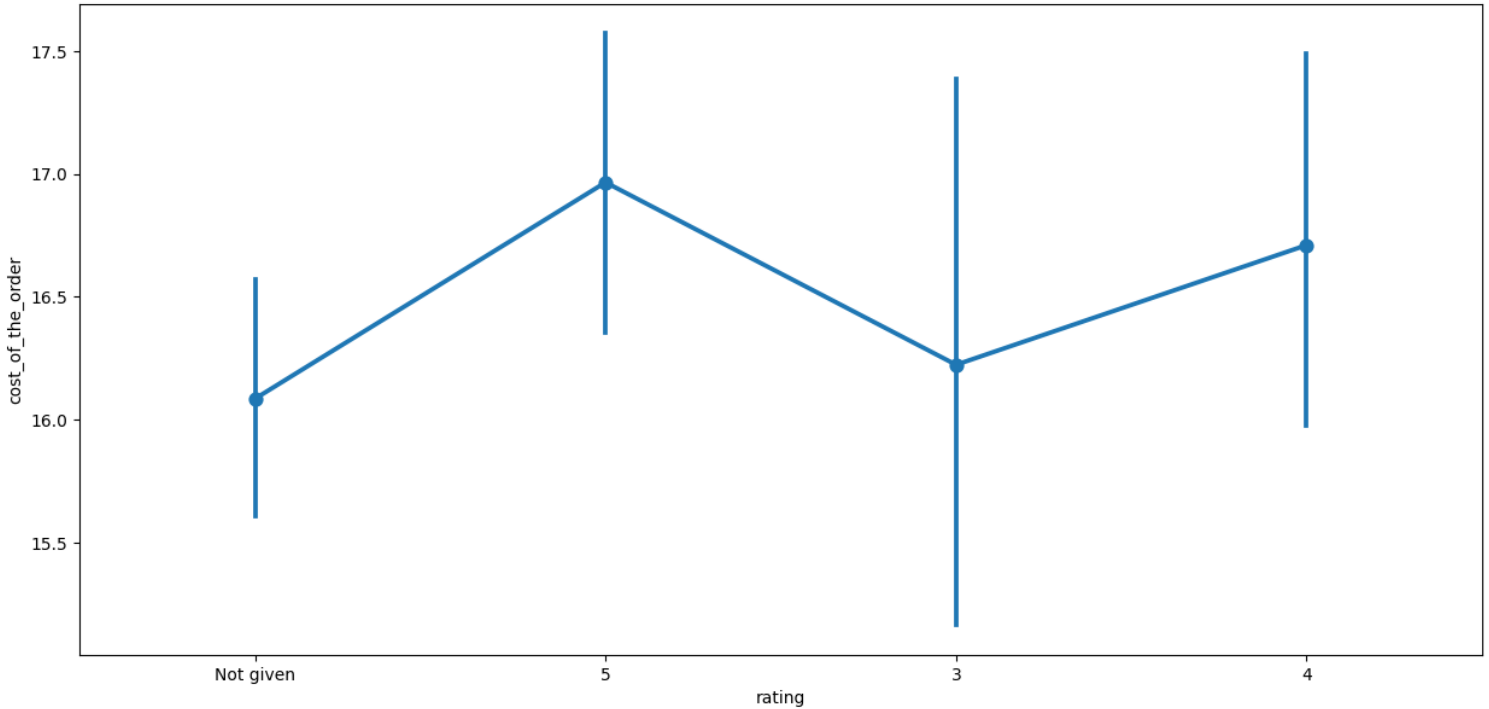
Rating vs. Food Preparation Time

- Food preperation times are slightly higher for the lowest rated orders
- Food preperation times are consistent across the other rated and unrated orders



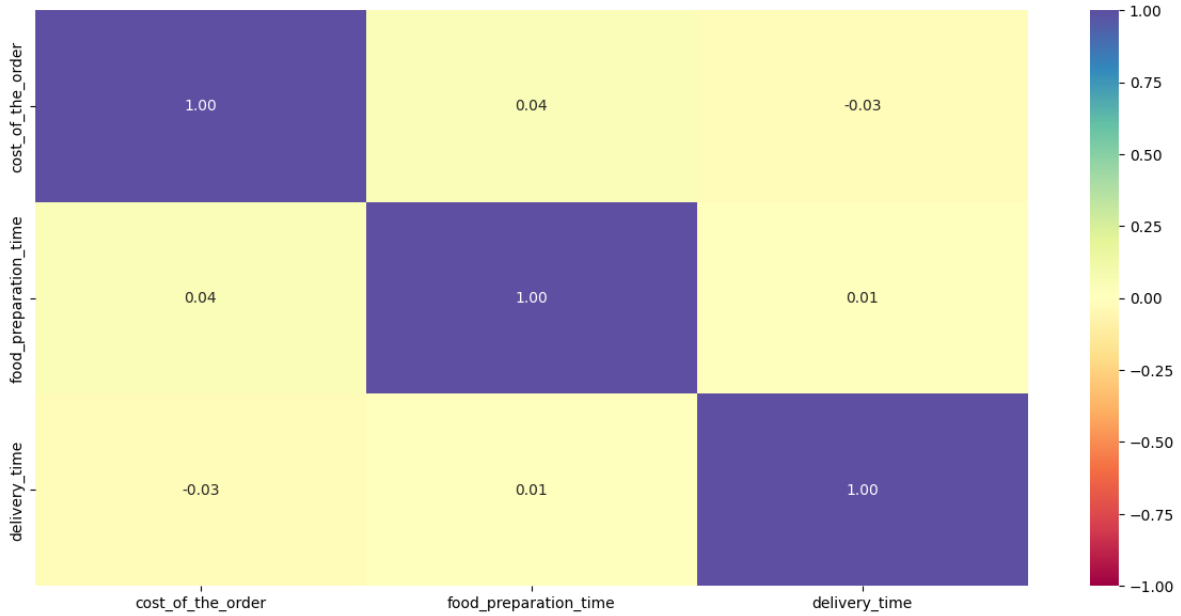
Rating vs. Cost of the Order

- Orders receiving the highest ratings also have the highest cost per order
- Orders that were not rated have the lowest cost per order



Correlations

- The correlation between delivery time and cost of order is negative
- The correlation between food preperation time and cost of order is positive but weak
- The correlation between food preperation time and delivery time is positive but weak



FoodHub Promotion

- These restaurants meet the criteria for the FoodHub promotional offer:
  - The Meatball Shop 4.511905 mean rating
  - Blue Ribbon Fried Chicken 4.328125 mean rating
  - Shake Shack 4.278195 mean rating
  - Blue Ribbon Sushi 4.219178 mean rating

- Top 3 most frequent customers eligible for 20% discount:
  - Cust#52832 13
  - Cust#47440 10
  - Cust#83287 9

Other Analysis

- The number of total orders that cost above 20 dollars is 555
- The percentage of orders above 20 dollars is 29.24 %
- The net FoodHub revenue is around 6166.3 dollars
- The number of orders in the dataset over 60 minutes is: 200
- Percentage of orders in the dataset over 60 minutes: 10.54 %
- The mean delivery time on weekdays is around 28 minutes
- The mean delivery time on weekends is around 22 minutes