

# FoodHub Order Analysis

...

By Emilie Helen Wolf

# Contents

1. Business Focus and Solutions Approach
2. Overview of the Data
3. Exploratory Data Analysis
4. Business Insights and Recommendations

# Business Focus and Solution Approach

The main focus of this analysis is to enhance the FoodHub customer experience by identifying trends in the data.

Key factors that could impact customer satisfaction and retention:

- Time it takes to receive an order
- Recognizable restaurant brands
- Variety of different food options
- Cost of the order
- Delivery person availability

As we identify more problems and find ways to improve, FoodHub will prevail as the best food delivery service in New York, which will increase company profits.

# Overview of the Data

Filename: foodhub\_order.csv

Rows: 1898

Columns: 9

Contains both  
numerical and categorical data

## Data Dictionary

1. `order_id`: Unique ID of the order
2. `customer_id`: ID of the customer who ordered the food
3. `restaurant_name`: Name of the restaurant
4. `cuisine_type`: Cuisine ordered by the customer
5. `cost_of_the_order`: Cost of the order
6. `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)
7. `rating`: Rating given by the customer out of 5
8. `food_preparation_time`: Time (in minutes) taken by the restaurant to prepare the food.
9. `delivery_time`: Time (in minutes) taken by the delivery person to deliver the food package.

# Overview of the Data

1898 orders

Food prep times range from 20-35 min

1200 customers

Delivery times range from 15-33 min

178 restaurants

Orders cost between \$4.47 and \$35.41

14 cuisine types

Ratings range from 3 to 5

Weekends have 2.5 times as many orders as weekdays

39% of orders are not rated and had the string “Not given” as a rating

The data appears normal and tidy with no missing data. However, orders without ratings were removed for some analyses.

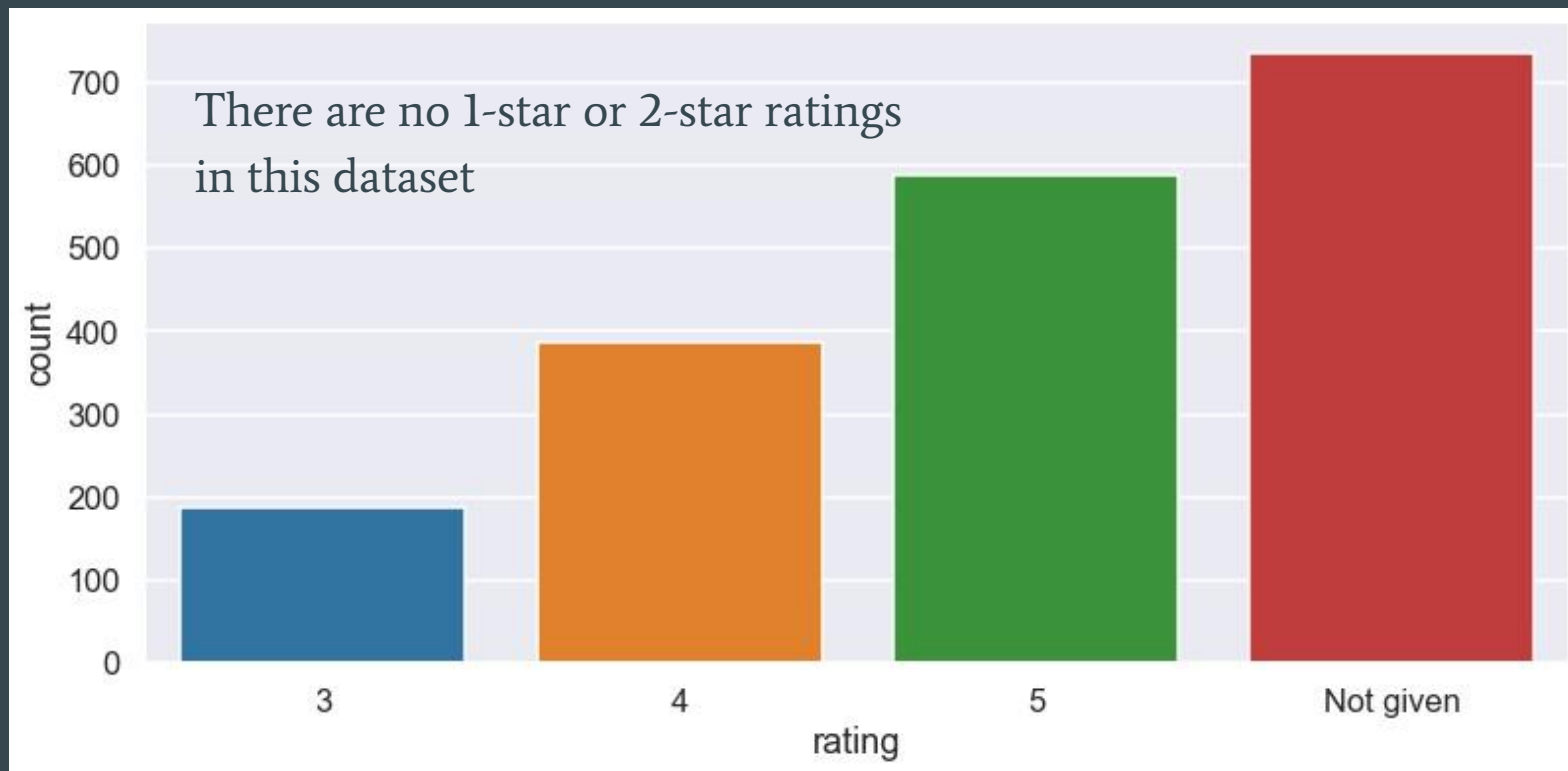
# Exploratory Data Analysis

First we performed univariate analyses on the numerical data to discover central tendencies or skewness.

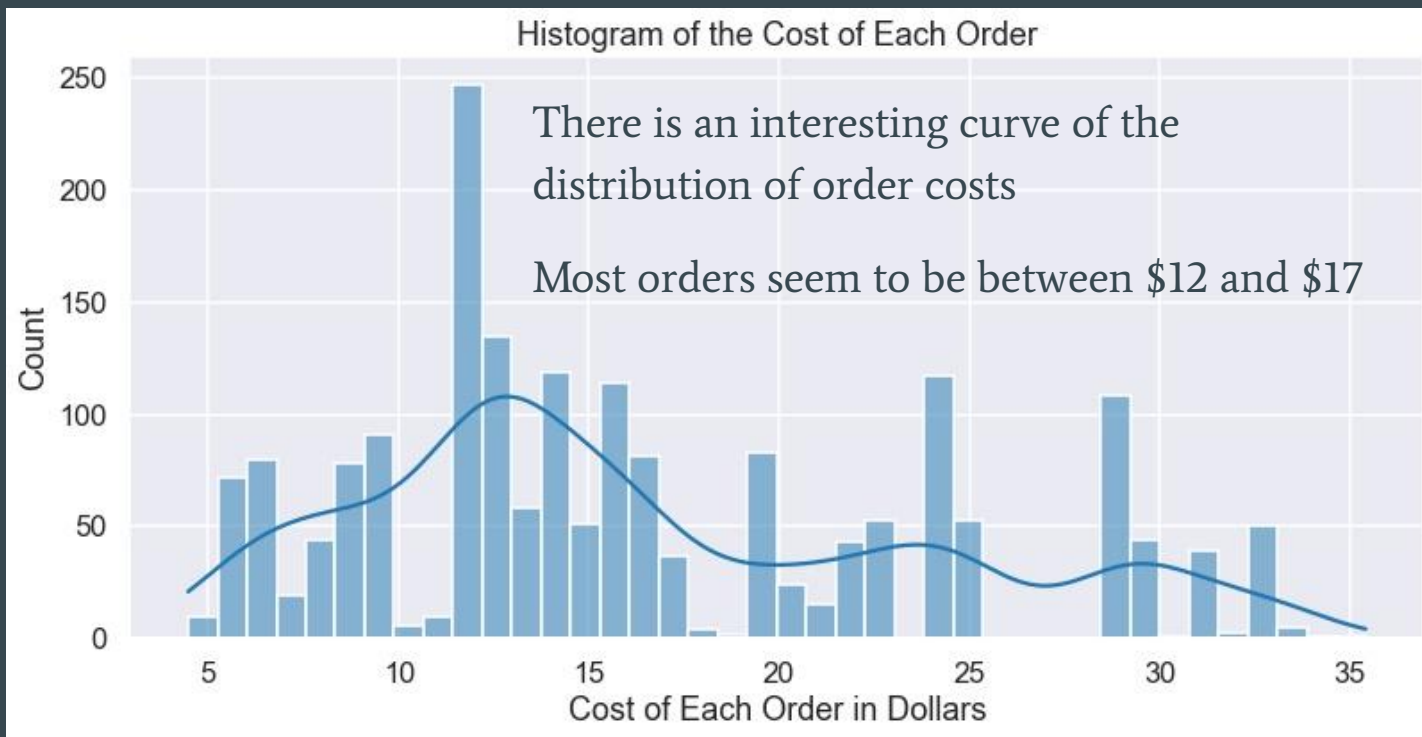
The histograms for rating and cost\_of\_the\_order are on the following pages.

rating (“Not given” removed)	mean: 4.34	median: 5	skewness: left
cost_of_the_order	mean: \$16.50	median: \$14.15	skewness: right
food_preparation_time	mean: 27	median: 27	skewness: none
delivery_time	mean: 24	median: 25	skewness: none

# Univariate - rating



# Univariate - cost\_of\_the\_order





# Exploratory Data Analysis

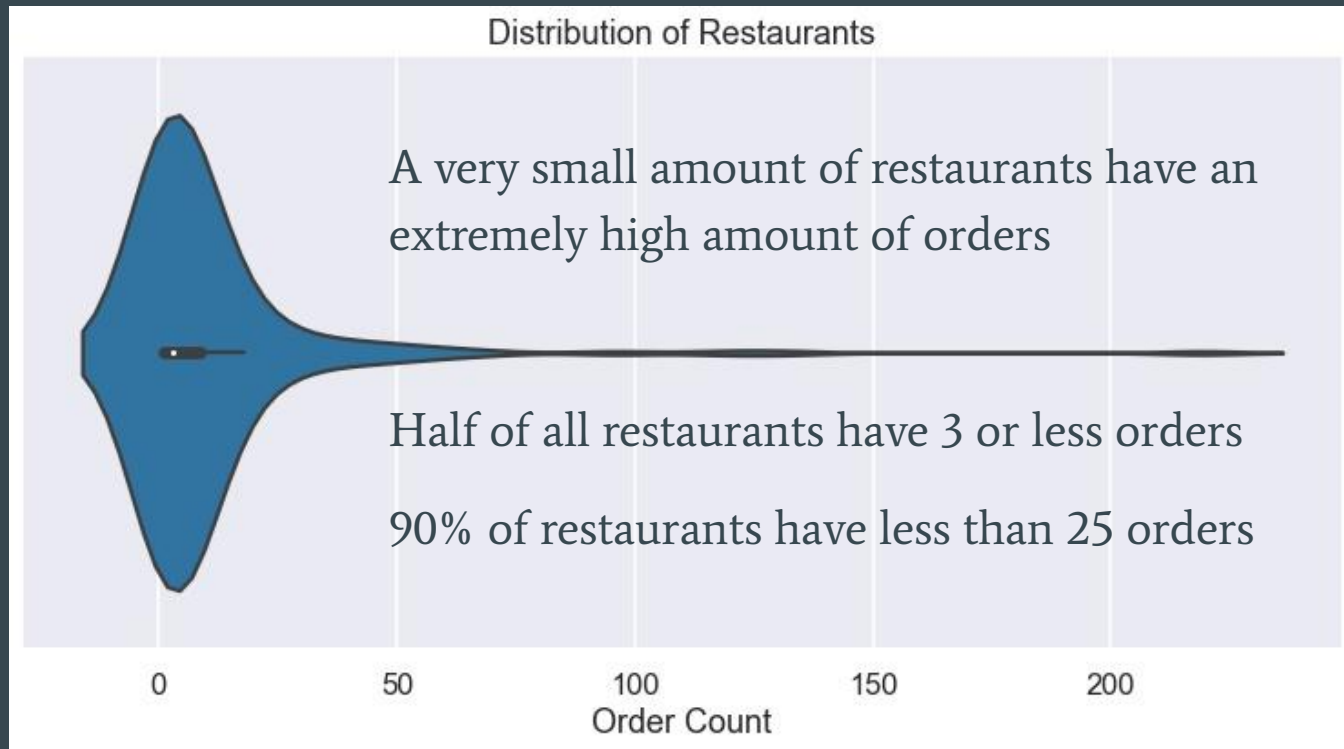
Next we performed univariate analyses on the categorical data to discover unique value counts.

`cuisine_type` - There is a wide range in popularity among the cuisine types. The range is from 7 orders (Vietnamese) to 584 (American).

`day_of_the_week` - Even though there are 5 week days and 2 weekend days, there are far more orders placed on weekends.

`restaurant_name` - The range in order count by restaurant is 1 to 219 with 75% of restaurants having fewer than 9 orders.

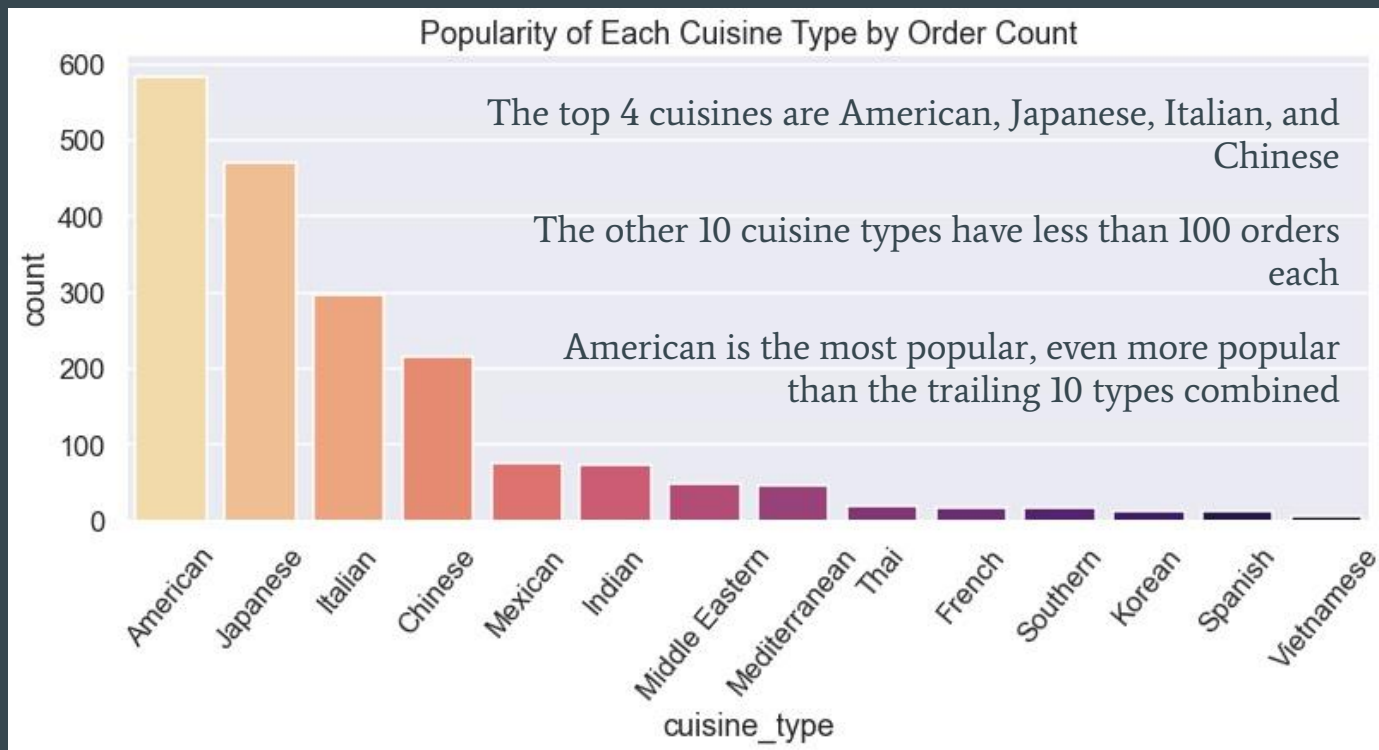
# Univariate - restaurant\_name



## Top 10 Restaurants

'Shake Shack',  
'The Meatball Shop',  
'Blue Ribbon Sushi',  
'Blue Ribbon Fried Chicken',  
'Parm',  
'RedFarm Broadway',  
'RedFarm Hudson',  
'TAO',  
'Han Dynasty',  
'Blue Ribbon Sushi Bar & Grill',

# Univariate - cuisine\_type



# Exploratory Data Analysis

Next we explored relationships between the different variables to answer some of the following questions:

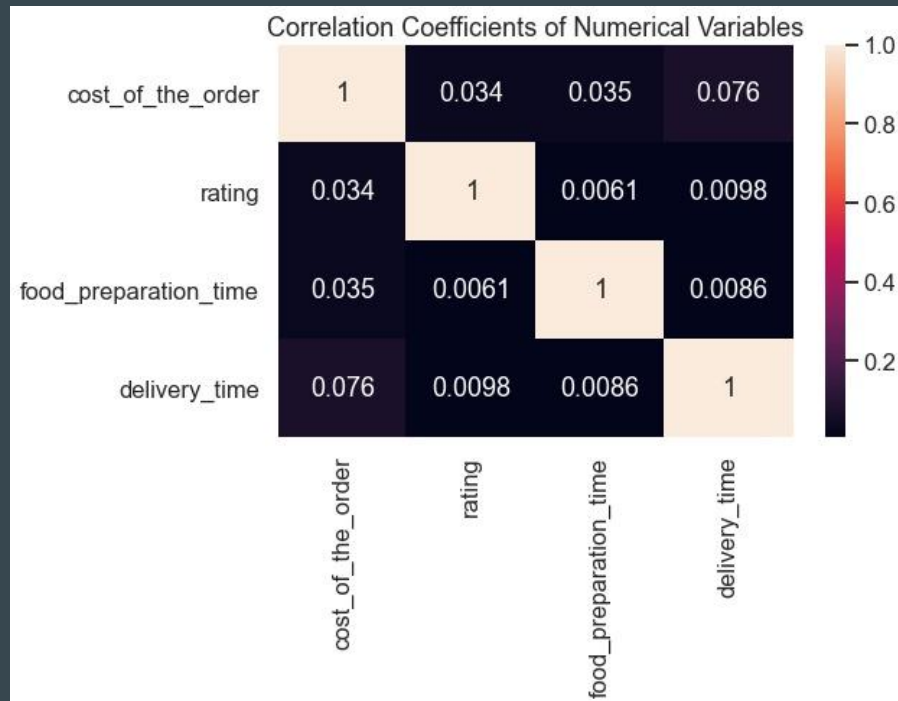
- Are long wait times related to poor reviews?
- As cost of the order increases, does food prep time increase?
- How do wait times compare by day of the week?
- What's the average order cost by cuisine type?
- How does each cuisine type perform in sales by day of the week?

# Exploratory Data Analysis

## Are long wait times related to poor reviews?

The heatmap shows there are no correlations among the numeric variables, not even weak ones, so we further explored the lowest rating only.

- For orders given the lowest rating of 3, the average total wait time is 52 minutes
- This is just a half-minute longer than the average total wait time across the whole dataset



# Exploratory Data Analysis

As cost of the order increases, does food prep time increase?

The previous heatmap shows there is no correlation, but we decided to explore deeper.

Here we see the points scattered evenly with a nearly horizontal regression line.

This graph confirms no relationship.



# Exploratory Data Analysis

## How do wait times compare by day of the week?

To calculate total wait times, we first combined the food prep times and delivery times into a new variable. The statistics below go with the graph on the next page.

- Shorter wait times occur on the weekend
  - Could this be because drivers are combining trips when it's busier on the weekends?
  - If we boosted the number of orders on weekdays, would the wait times become shorter?
- Avg total time on weekdays: 56 minutes
- Avg total time on weekends: 50 minutes
- About 10.5% of all orders have greater than 60 minutes of total delivery time

# Multivariate - day\_of\_the\_week, total\_time





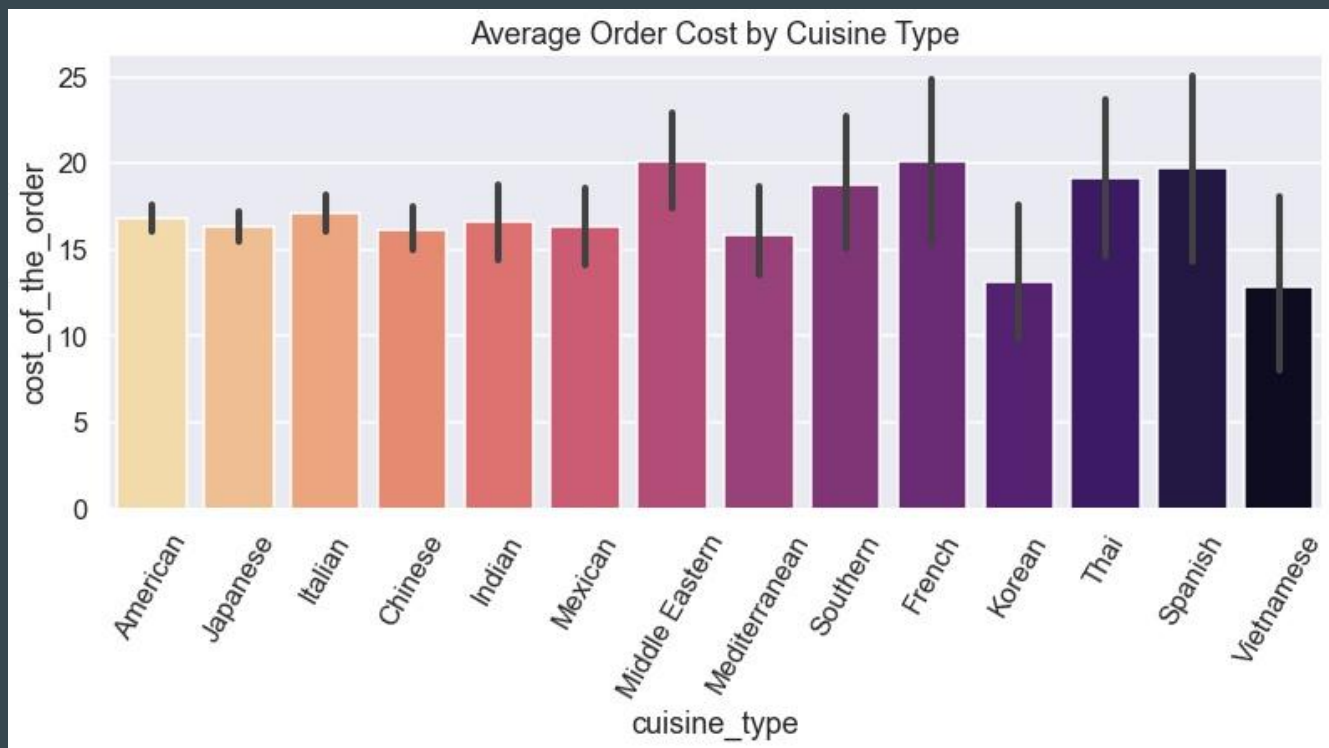
# Exploratory Data Analysis

What's the average order cost by cuisine type?

The graph on the next page shows the average order cost by cuisine, ranked by order count.

- The more popular cuisines on the left seem to have similar averages in price
- The less popular cuisines on the right have higher costs per order on average, but with less confidence (since there are so few data points collected)
- It's beginning to look like NYC is saturated with cheap American food

# Multivariate - cost\_of\_the\_order, cuisine\_type



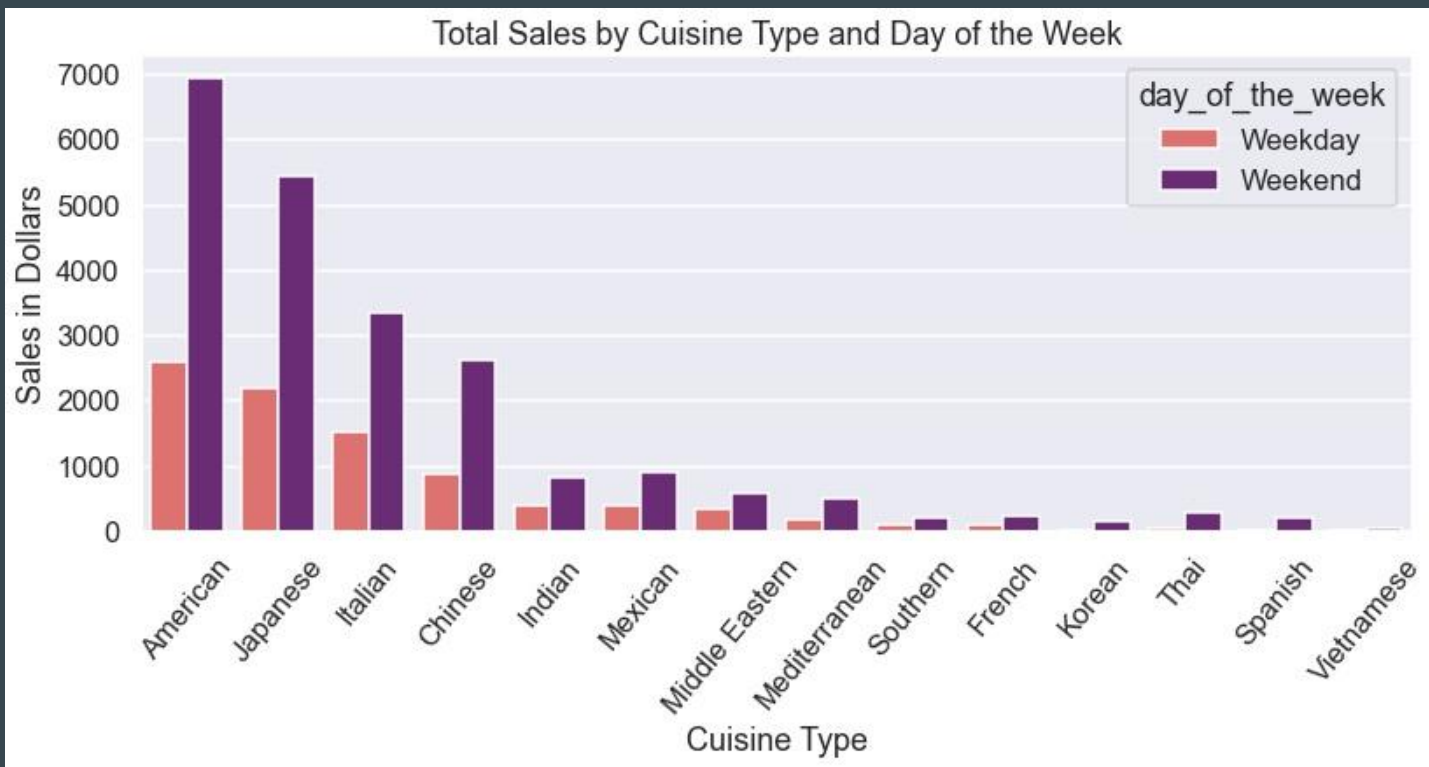
# Exploratory Data Analysis

How does each cuisine type perform in sales by day of the week?

The graph on the next page shows the total sales by cuisine, split by day of the week, and ranked by count, same as the last graph.

- Again we see the top 4 cuisine types dominating the chart.
- This graph makes it more obvious how the less popular cuisine types are affected by day of the week.
- Korean, Thai, Spanish, and Vietnamese generate negligible sales on weekdays.

# Multivariate - cost\_of\_the\_order, cuisine\_type, day\_of\_the\_week



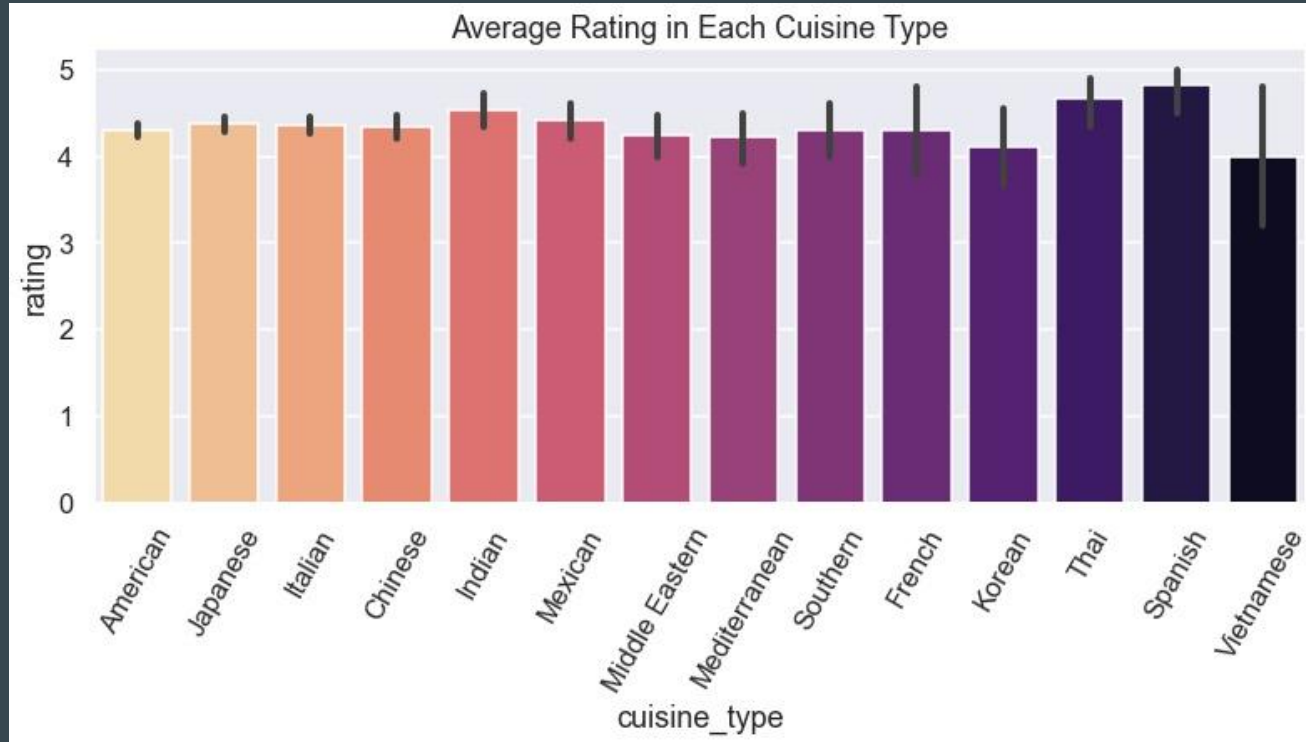
# Exploratory Data Analysis

What's the average rating in each cuisine category?

The graph on the next page shows the cuisine types with their average ratings.

- The average ratings are similar in all the different cuisine categories.
- The cuisines on the far right have less data points and therefore less confidence in the mean.
- However, Spanish stands out as having the highest average rating.

# Multivariate - rating, cuisine\_type



# Exploratory Data Analysis

Exactly how many restaurants are listed in each cuisine category?

American	41	Middle Eastern	7
Italian	31	Korean	5
Japanese	29	Mediterranean	5
Chinese	16	French	3
Indian	14	Spanish	3
Mexican	11	Vietnamese	3
Thai	9	Southern	2

It looks like American, Italian, and Japanese restaurants have dominated the app.

Is this indicative of the actual market share?

Is NYC saturated with American restaurants or are American restaurants more likely to register with FoodHub?

# Business Insights and Recommendations

Based on what we've learned, there are some areas that could be improved.

The actions on this page and the next will require more data collection and careful hypothesis testing in order to increase customer experience. There is still so much we don't know about customer behavior and more questions are inevitable.

## Action > Increase orders placed on weekdays

- Get more delivery drivers on the road during the week
- Send reminders to customers who have never ordered during the middle of the week
- Offer discounts on the slowest days of the week



# Business Insights and Recommendations

## Action > Increase the average cost per order

- Suggest add-on menu items during the ordering process
- Entice customers in the app to try new restaurants that have higher-end food items
- Offer free delivery or other perks for orders over a certain amount
- Promote "Party Trays", "Family Meals", or office lunch catering deals

## Action > Increase the number of orders overall

- Smaller charges to restaurants who refer more customers to join the app
- Customer referral bonuses (friends bring in more friends)
- Rotating specials for repeat customers (keep them coming back)
- Branding on driver vehicles
- Recruit more restaurants to join the app
- Increase app visibility by asking more customers to rate the app and leave feedback
- Find out if there are patterns across one-time customers and repeat customers

# Business Insights and Recommendations

## Final Thoughts

Perhaps the biggest takeaway from this dataset is that there is a huge percentage of restaurants in the app that are not getting many orders, while at the same time there is just a handful of popular restaurants that are dominating the service.

It's good to know FoodHub offers a wide variety of restaurants and cuisines, but perhaps it's overwhelming to the customer to sift through hundreds of restaurant options when it's easier to select a popular and familiar food chain like Shake Shack.

Fitting the right customer to the right restaurant with the least friction is key!

**Thank You**