Analytics Case Study

Sigma 2021

The problem

Company

Star-In Airlines is a relatively newer airline introduced in India. It started functioning in 2017 and has been working ever since. Its home base is the New Delhi Airport. Considering the novelty of this airline, it is bound to face competitions from other domestic airlines in India. In order to develop a loyal customer base, the company wants to understand the key demographics of their customer base.

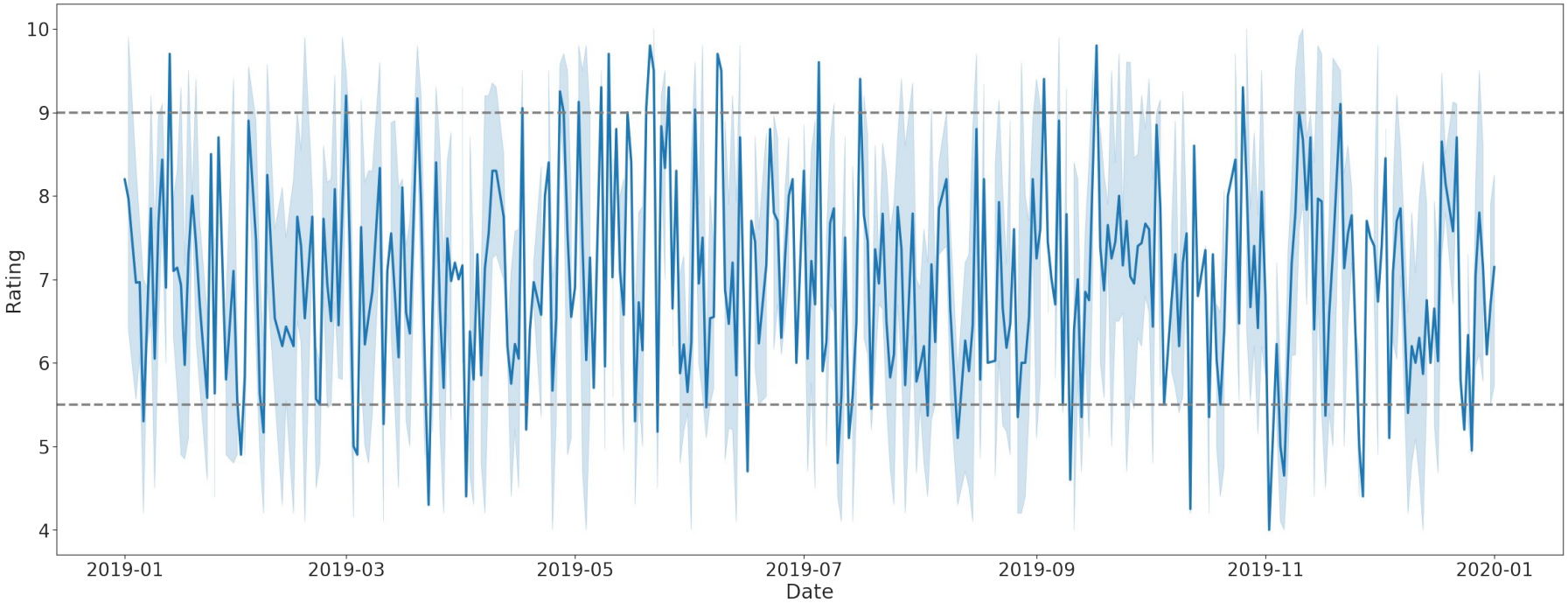
Context

You are appointed as a new intern in the Data analyst team at Consult-data Services. Analyse the data at hand and use it to help Star-In. Read through the problem statement thoroughly to help the company make suitable analysis and help them by answering the problem statements that follow.

Problem statement

1. It is believed that the customer satisfaction ratings in the summer months is higher than the rest of the year. Test the hypothesis stating all assumptions.

Solution


10
9
8
7
6
5
4
Rating
2019-01
2019-03
2019-05
2019-07
2019-09
2019-11
2020-01
Date

Observations

Summers = Satisfaction

According to the visualization the rating during the mid-year months like “May” seems to be higher when compared to the extreme left of the graph which essentially includes the winter months.

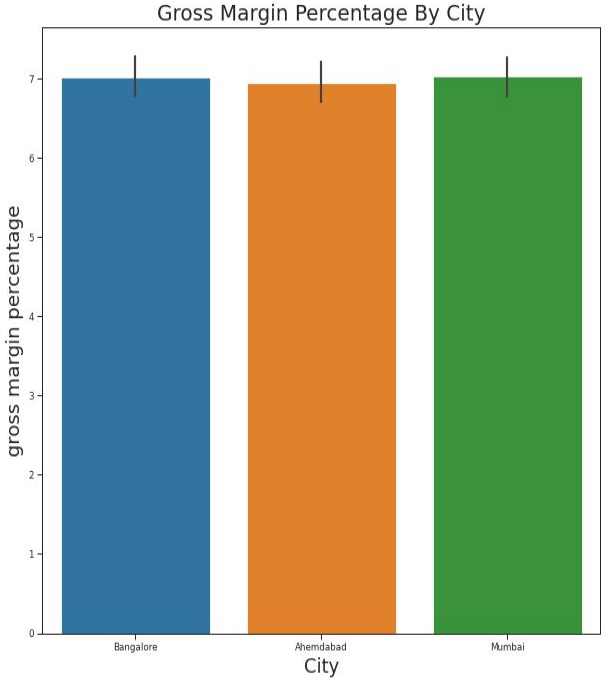
So the hypothesis “the customer satisfaction ratings in the summer months is higher than the rest of the year.” turns out to be TRUE.

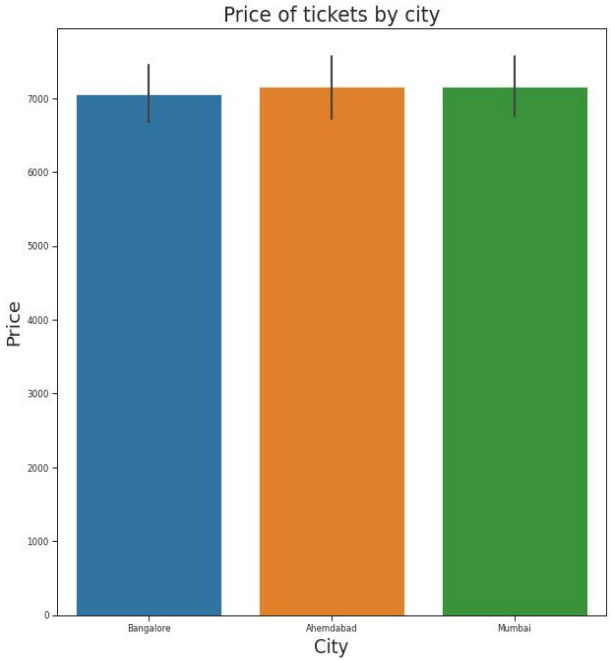
The problem

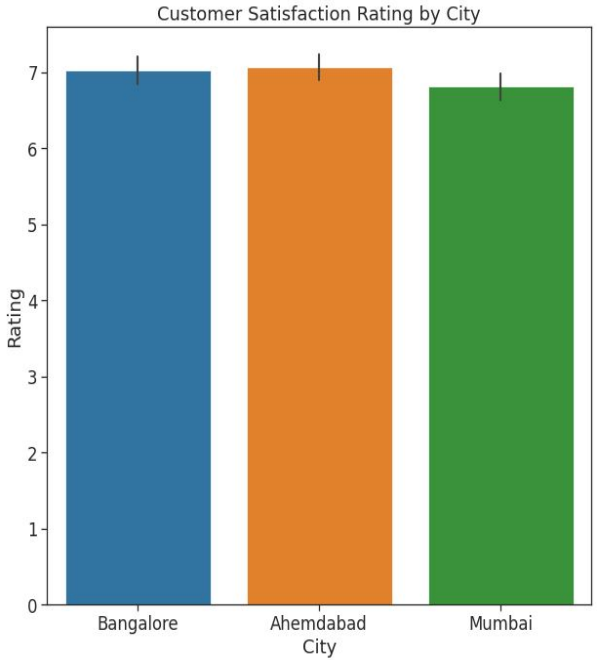
Problem statement

2. Star-In Airlines wants to start another flight to one of the destinations. Which destination out of Bangalore, Delhi and Mumbai shall it start another flight to? Support your answer with logical analysis.

Solution


Gross Margin Percentage By City
gross margin percentage
0
1
2
3
4
5
6
7
Bangalore
Ahemdabad
Mumbai
City


Price of tickets by city
Price
0
1000
2000
3000
4000
5000
6000
7000
Bangalore
Ahemdabad
Mumbai
City


Customer Satisfaction Rating by City
Rating
0
1
2
3
4
5
6
7
Bangalore
Ahemdabad
Mumbai
City

Observations

Bangalore it is.

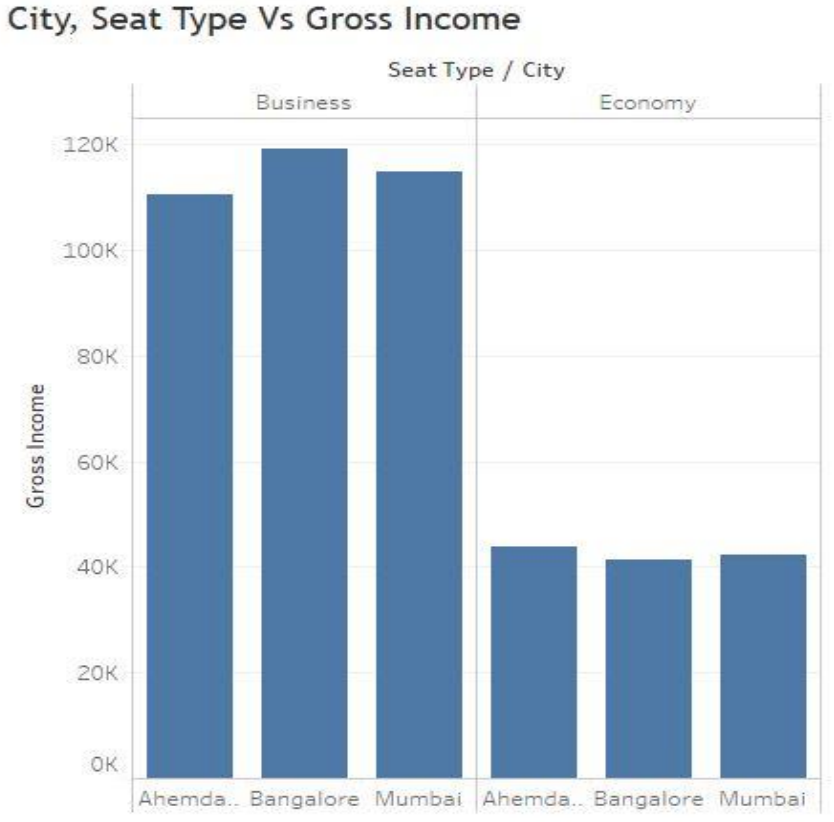
Star-In Airlines should consider starting another flight to Bangalore because there is significant demand and high gross income margin percentage comes from Bangalore. People are more satisfied according to the reviews and the ticket prices are less compared to Mumbai where gross income margin percentage is lower and ticket prices are high.

The problem

Problem statement

3. To attract more customers to buy Business Class seats, Star-In Airlines plans on offering a 10% off on all Business Class flights. Based on Market Research, this is supposed to increase revenue by 10%. Is this offer cost effective?

Solution


City, Seat Type Vs Gross Income
Seat Type / City
Business
Economy
120K
100K
80K
60K
40K
20K
0K
Gross Income
Ahemda..
Bangalore
Mumbai
Ahemda..
Bangalore
Mumbai

Observations

More tickets sale, more profit.

A 10% discount will make the people choose Star-In Airlines over other competitors. The 10% discount in the business class may tempt more customers to buy business class tickets and as the sales for business class tickets is already high plus the market research shows that it is supposed to increase the revenue by 10% this would definitely be cost effective for Star-In Airlines.

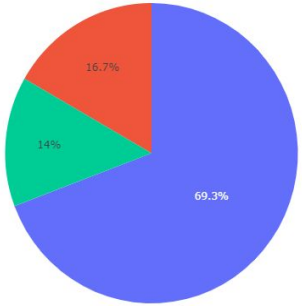
The problem

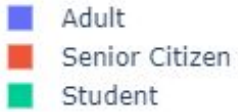
Problem statement

4. The Airlines is planning to launch a discount on the in-flight food menu for a particular category of flyers – Students, Adults or Senior Citizen. Use visualisation tools to determine which category of users should be offered the discount and what product – Sandwich, Cold Drink or Packaged Peanuts shall go on discount.

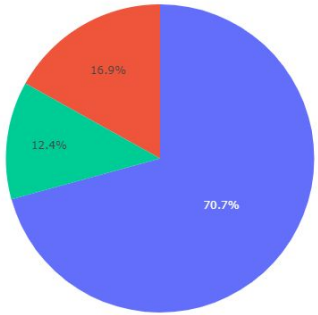
Solution

Types of age group who drink Cold Drinks

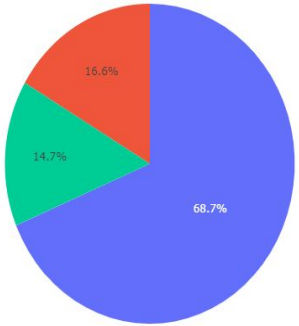




Types of Age Group who eat sandwiches



Types of age group who eat Packaged Nuts



Observations

The right discount strategy would be for senior citizens on sandwiches.

Senior citizens are consuming less sandwiches when compared to adults and students. The consumption pattern is dominated by Adults. Providing a discount for the senior citizens on sandwiches will make them feel good about the new prices. They can give a volume discount. The more they buy, the less they pay. This will drive in the sales and cause profit.

Part II

Company

At the Delhi airport, there works a waitress named Montana. She has been working at a restaurant for three years now. One day, when she was pondering over the tips she collected over the year and hence started recording the tips she collects and some additional data points for her analysis.

Context

She recorded the total bill of the customer on which she was tipped, followed by the amount she was tipped. In order to have a holistic analysis, she recorded the most common meal that the customer ordered, out of the Specials of the Day and the Maharaja Thali. Restaurant opened only for Dinner and Lunch. The day of dine-out was also recorded.

Problem statement

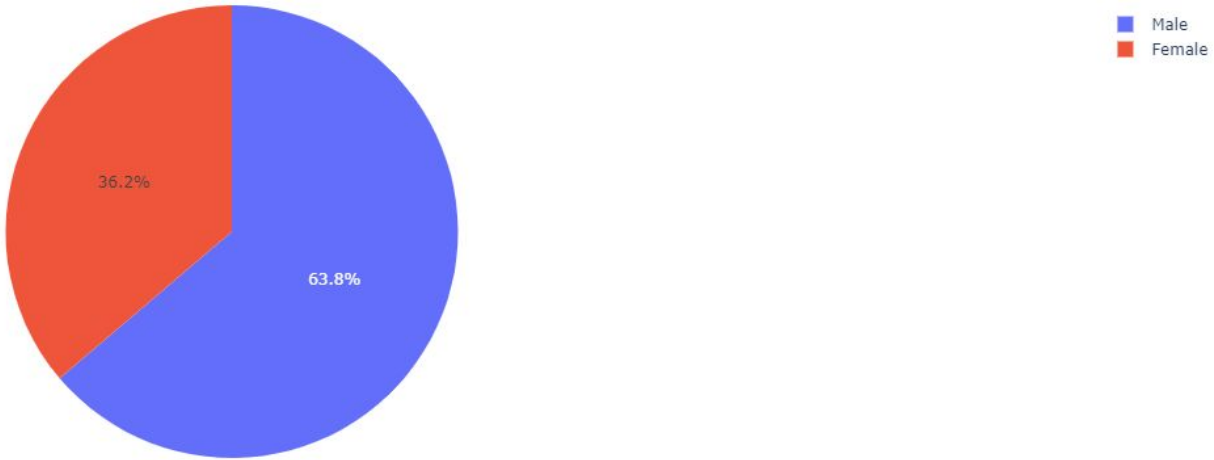
1. Produce a summary report of the kind of customer crowd that the waiter addresses over the span of time she has collected this data.

Solution

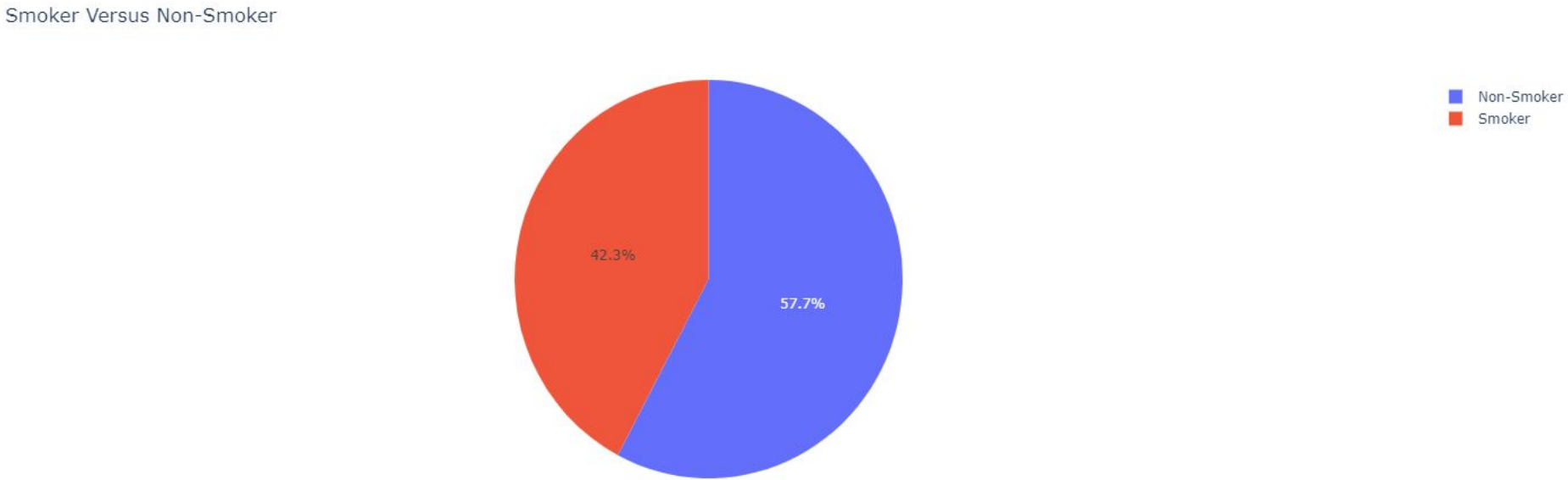
Summary report on Customers.

The customer gender statistics are dominated by Males. According to the visualization about 63.8% males visit the restaurant frequently. The female percentage stays at 36.2%

Gender percentage of the customer



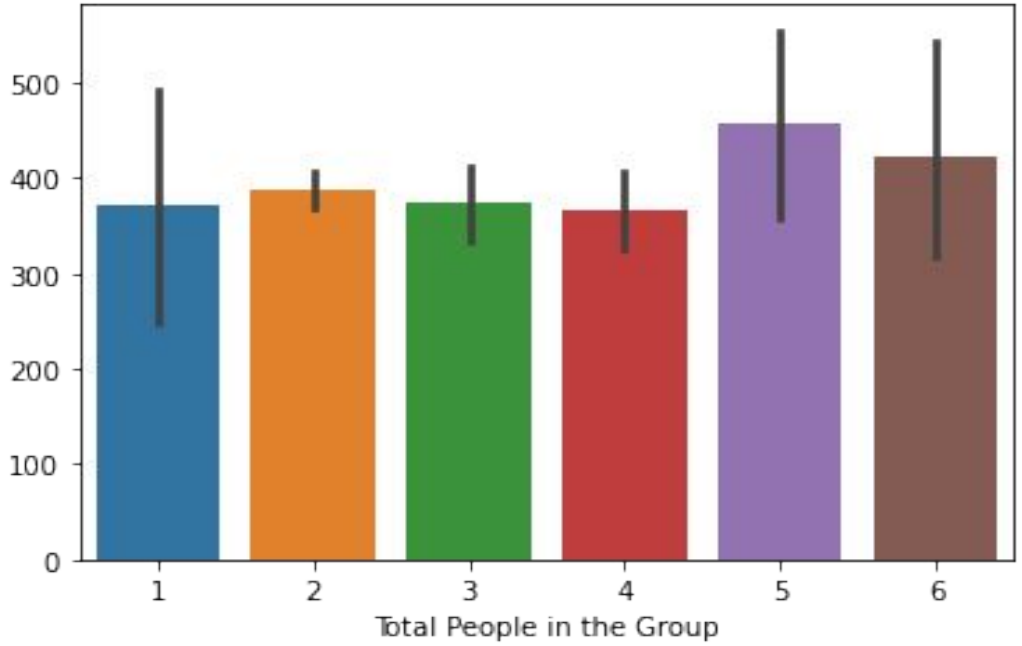
The Smoker versus Non-Smoker statistics are dominated by Non-Smokers. According to the visualization about 57.7% Of Non-Smokers and 42.3% of smokers



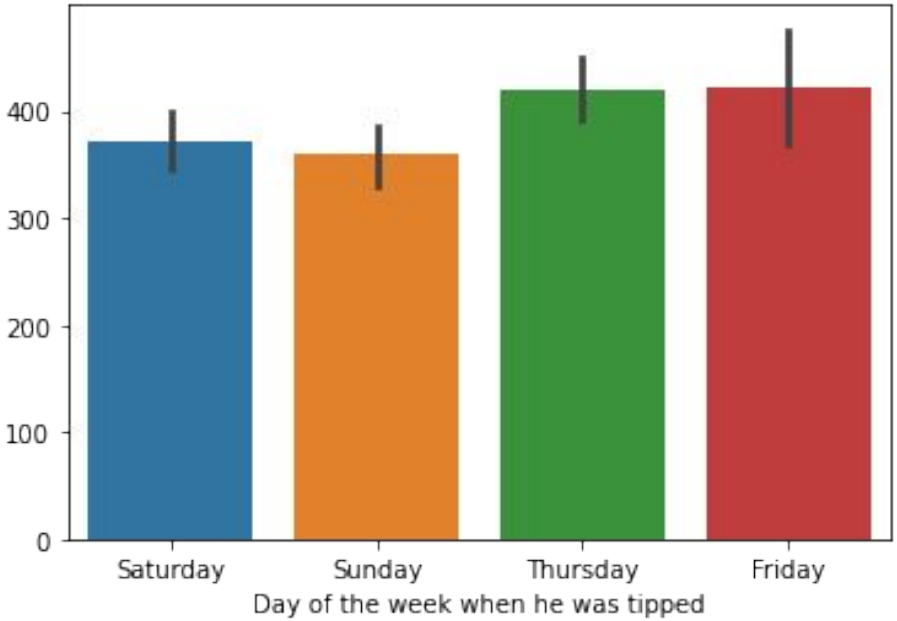
The summary statistics of numerical variables

	Total Bill of the Customer	The amount he was tipped by the customer	Total People in the Group
count	768.000000	768.000000	768.000000
mean	19.814622	3.000065	2.570312
std	8.902711	1.380372	0.944485
min	3.070000	1.000000	1.000000
25%	13.370000	2.000000	2.000000
50%	17.815000	2.900000	2.000000
75%	24.270000	3.550000	3.000000
max	50.810000	10.000000	6.000000

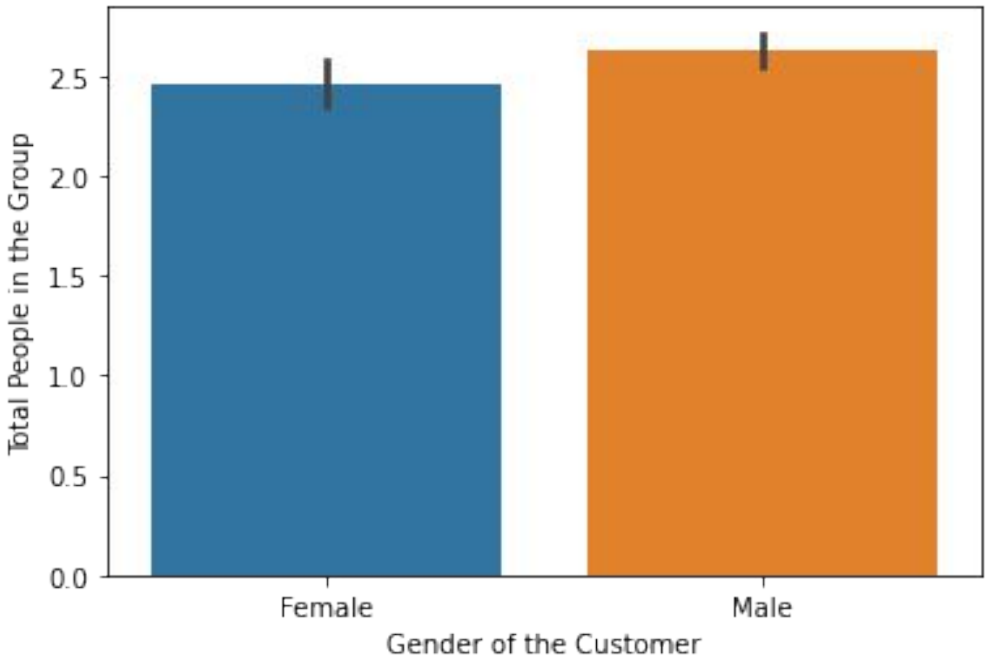
- Average people in a group are 2.57 round off to 3.
- The maximum number of people in a group are 6 people
- The average amount tipped by the customer is 3Rs.
- People tend to come in group of 5 the most.



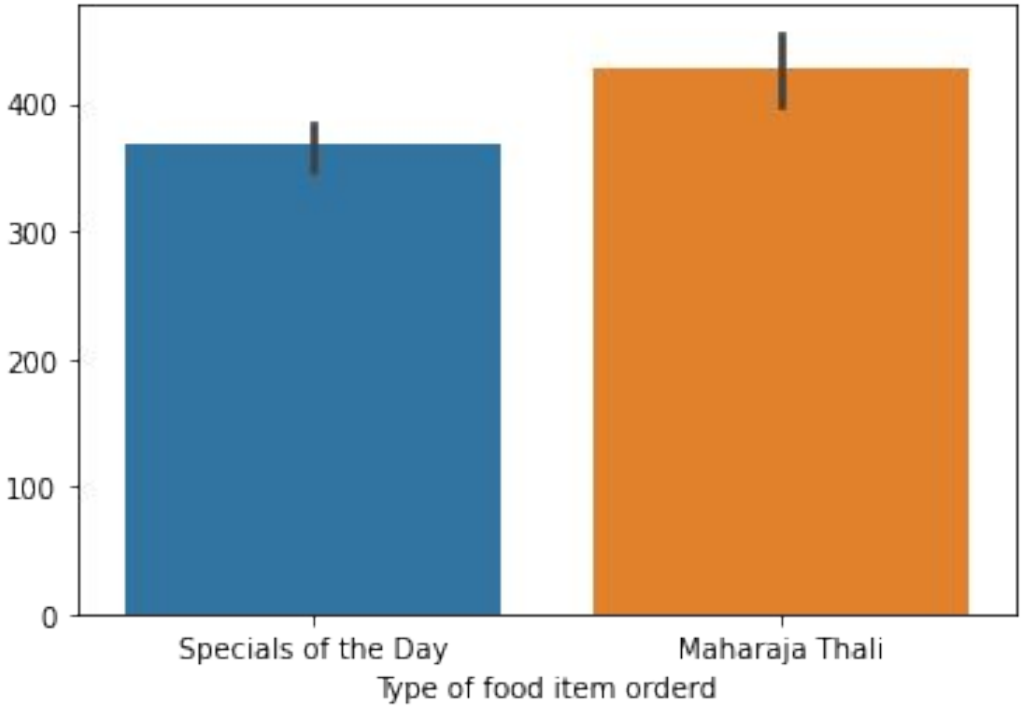
- The restaurant is only open 4 days of the week
- Friday seems to be the most busy day



Males tend to have more people in the group when compared to the female customers.



Customers prefer Maharaja Thali as the food item more, over the Specials of the day.



The problem

Problem statement

2. How do the various variables correlate with the tipping amount? Compute, visualise and infer.

Solution

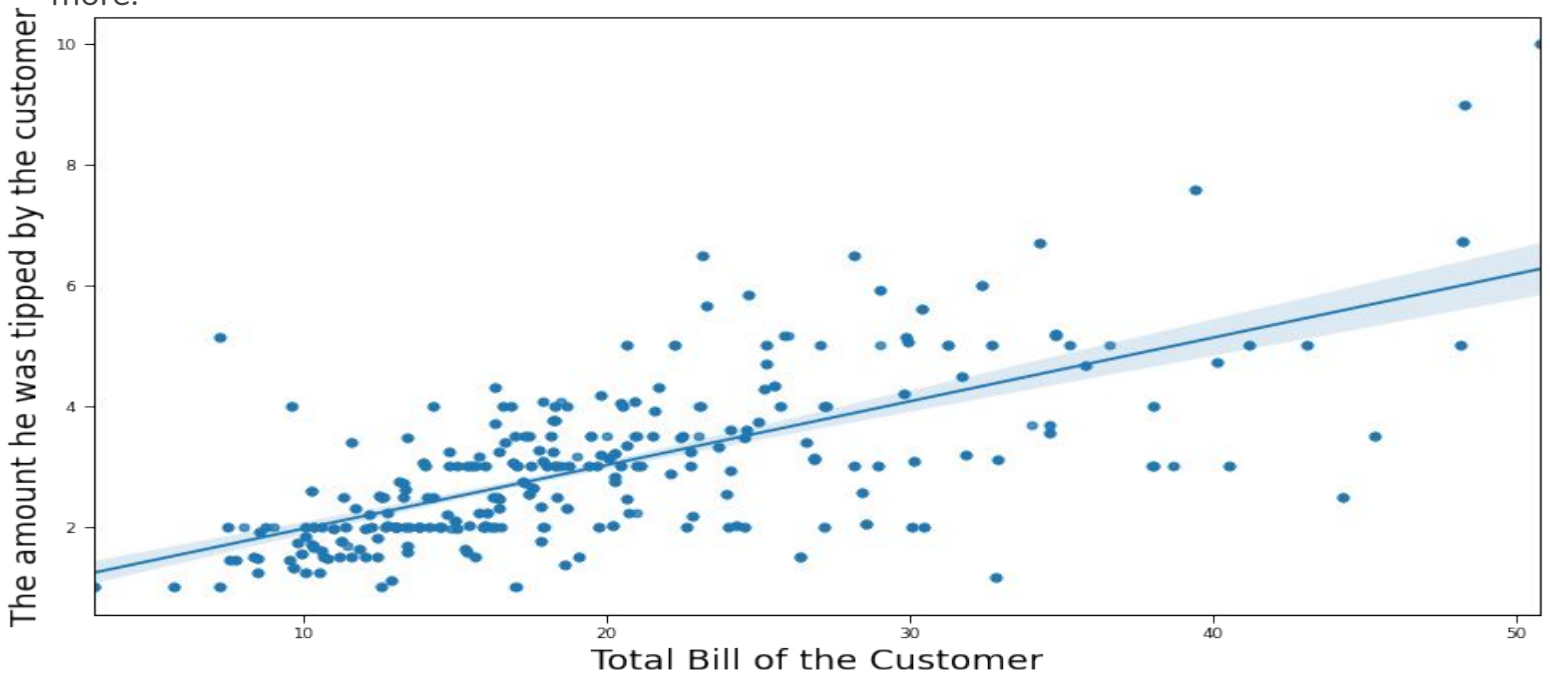
Heatmap of Correlation of different variables

The numbers in this map represent the correlation constant between those numerical variables

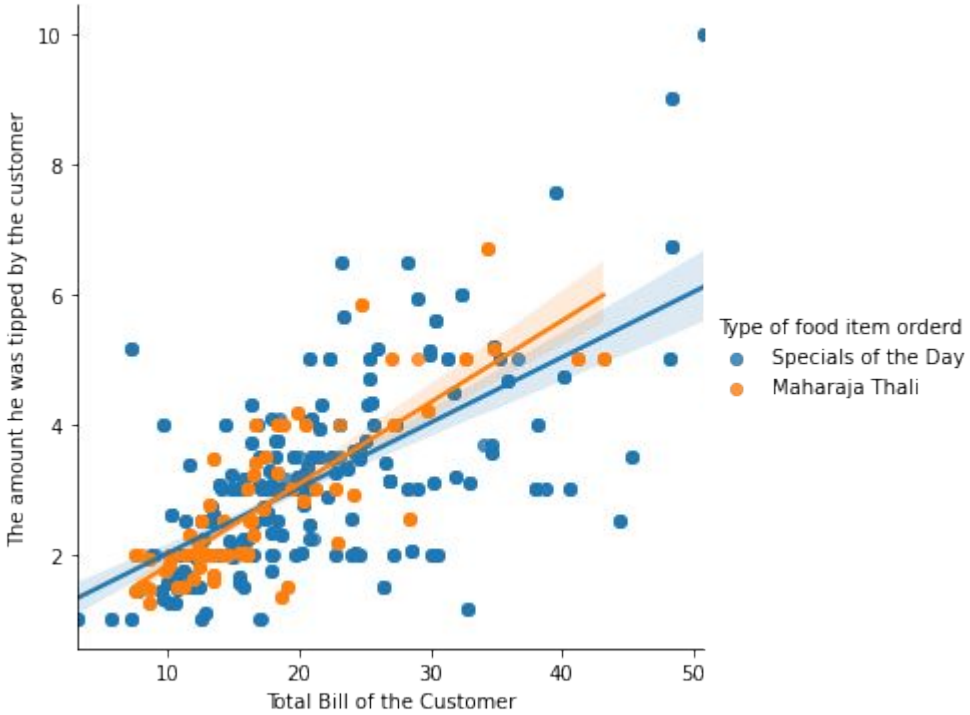
- The total bill of the customer and the amount she was tipped by the customer seem to be positively correlated.
- The total people in the group seem to be positively correlated with the total bill of the customers.

Regression Plot showing the correlation between Amount tipped and the total bill of the customers

The correlation is positive having a value of about 0.68 customers with more bill amount tip more.

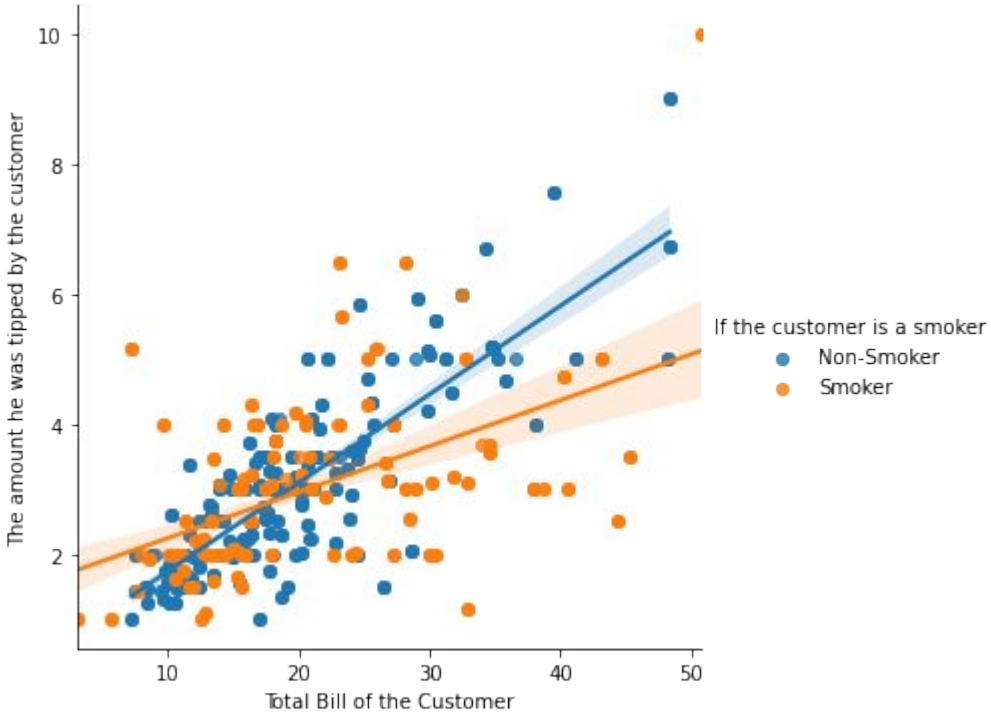


The linear model plot shown below shows the comparison between total bill amount and the total tip received by the type of food they tend to eat.



Customers who eat “Specials of the day” have more total bill and they are more likely to tip more.

The linear model plot shown below shows the comparison between total bill amount and the total tip received between customers who smoke and who don’t.

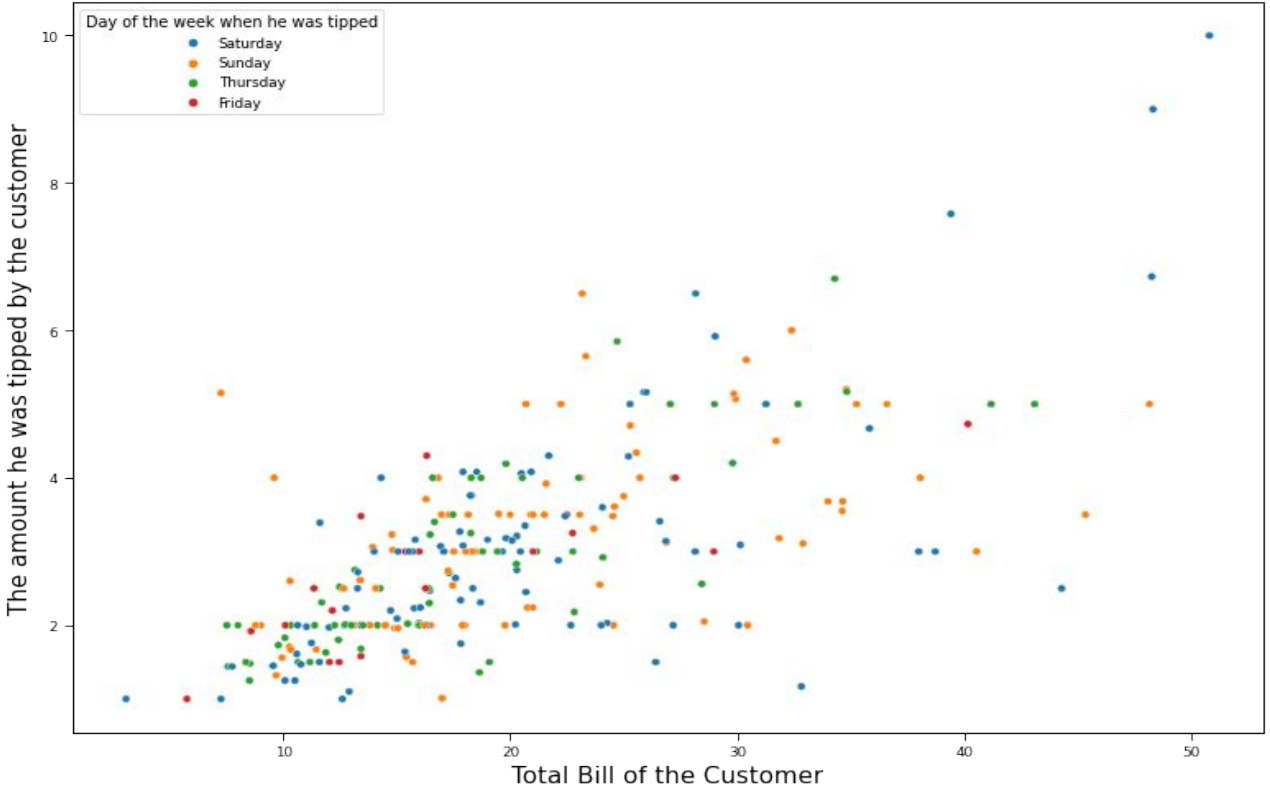


We can infer from the plot that Non Smokers generally are likely to tip more when compared to smokers.

The linear model plot shown below shows the comparison between total bill amount and the total tip received between the two genders male and female.

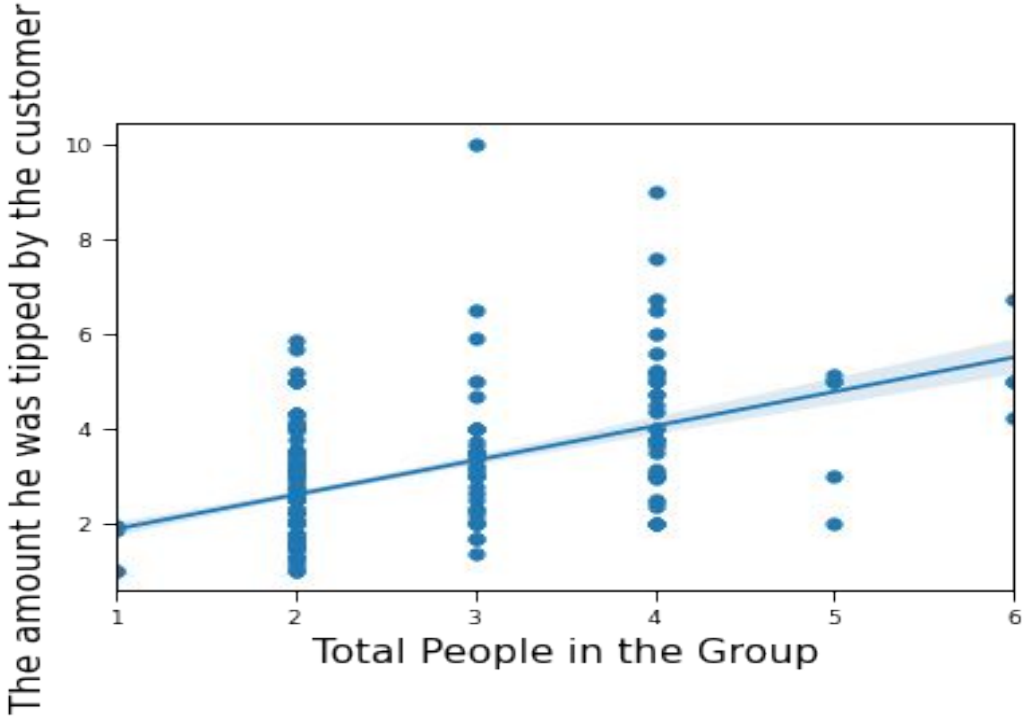
As the majority of customers were male they are also likely to tip more.

The Scatter plot shown below shows the comparison between total bill amount and the total tip received on different days of the week restaurant opens on.



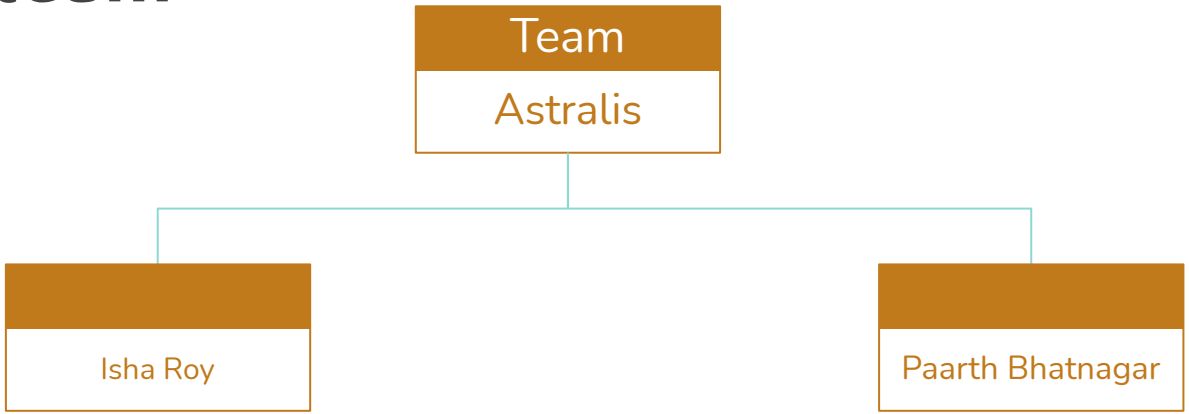
There is no significant correlation but customers are more likely to pay more tip on saturdays when compared to any other day the restaurant is open on.

The Regression plot shown below shows the comparison of the total people in the group versus the amount tipped by them



Even though not very significant there does seem to be a correlation (having a correlation constant of 0.5) between the number of people in a group and the total amount they tip.

The team



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