



# G2M Case Study Virtual Internship

## Investment Analysis

**Analysis of Profit Share and Customer Profile of Two Cab Companies**

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In this project, we are given several datasets pertaining to two cab companies (yellow and pink) operating across several US cities and their customer profile. We will draw insights from the data and try to answer seven questions. Our goal is to make a recommendation to XYZ company on which company they should invest in based on these answers.

- Does city population play a role on profit? If it does, which company is more ubiquitous in highly populated cities?
  - Are middle aged men the most profitable customer profile? If so, which company do they patronize more?
- Do people travel more during summer months? Which company attracts more customers during busiest months?
  - Which company dominates the industry?
  - Which company's customers are more loyal?
- Do people earning more bring in more profit? If so, which company attracts these people more?
- Do people earning more use cabs more frequently? If so, which company these people prefer more?



### Files Used in this Project:

- Cab\_Data.csv
- City.csv
- Customer\_ID.csv
- Transaction\_ID.csv

### Final Dataset :

- 14 features
- 355032 observations
- Time Frame is from 01/31/2016 to 12/31/2016

### Assumptions Made:

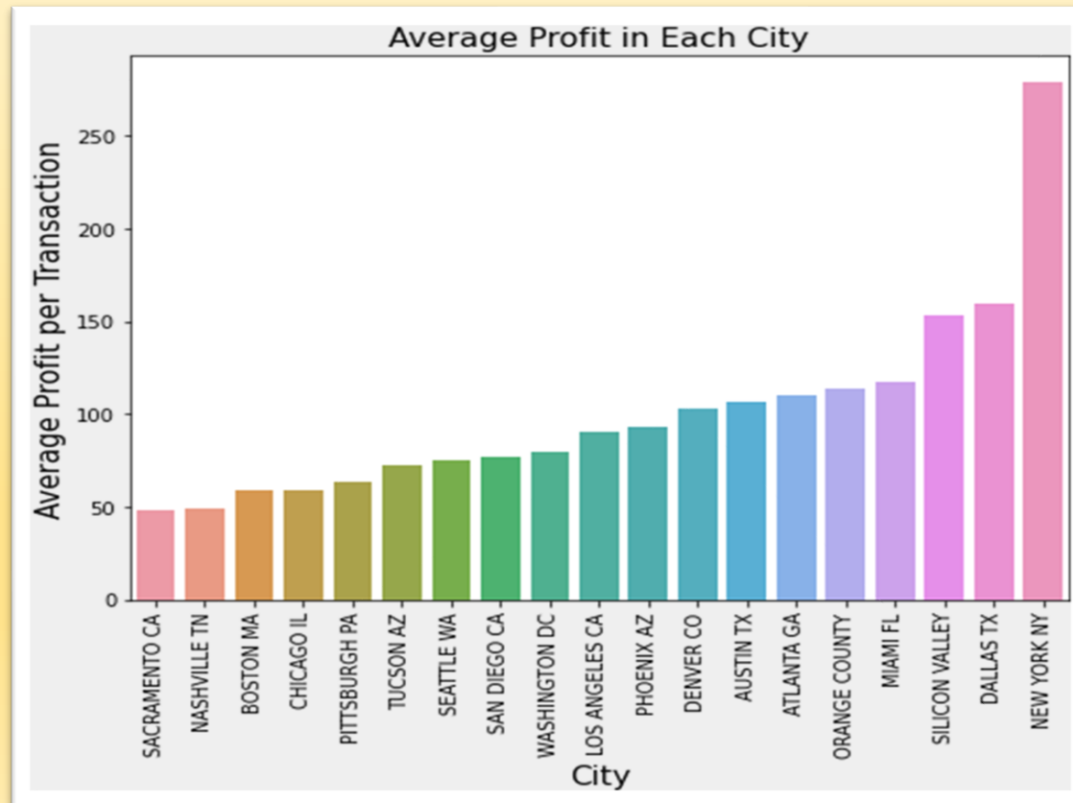
- The dataset includes only the last day of January of 2016. When calculating busiest months of the year, for January of 2016, the average of distance travelled during the months of January of 2017 and January of 2018 was used.
- When calculating profit per city, average profit made in each city was used.



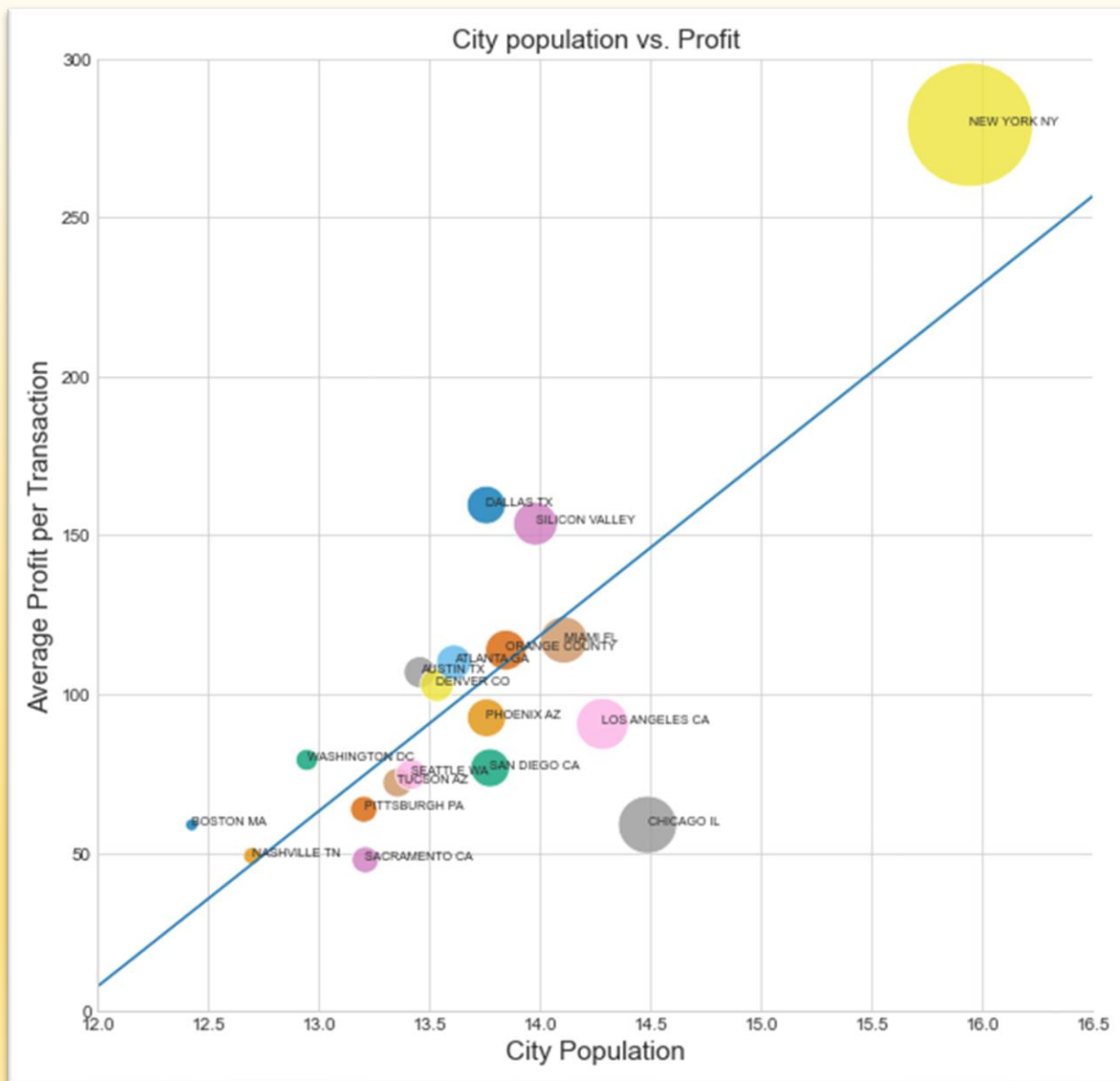
**Does City Population Play a Role on Profit? If it does, Which Company is More Ubiquitous in Highly Populated Cities?**

**Hypothesis: We believe cab companies would make more profit in more populous cities.**

Let us see if there is any correlation between the population of a city and the profit made by the companies in that city. If there is, we will explore which cab company is more dominant in the most populous cities to make a recommendation to XYZ firm.



From the graph, we see cab companies make more profit per ride in Silicon Valley, Dallas and New York City than the rest of the cities.



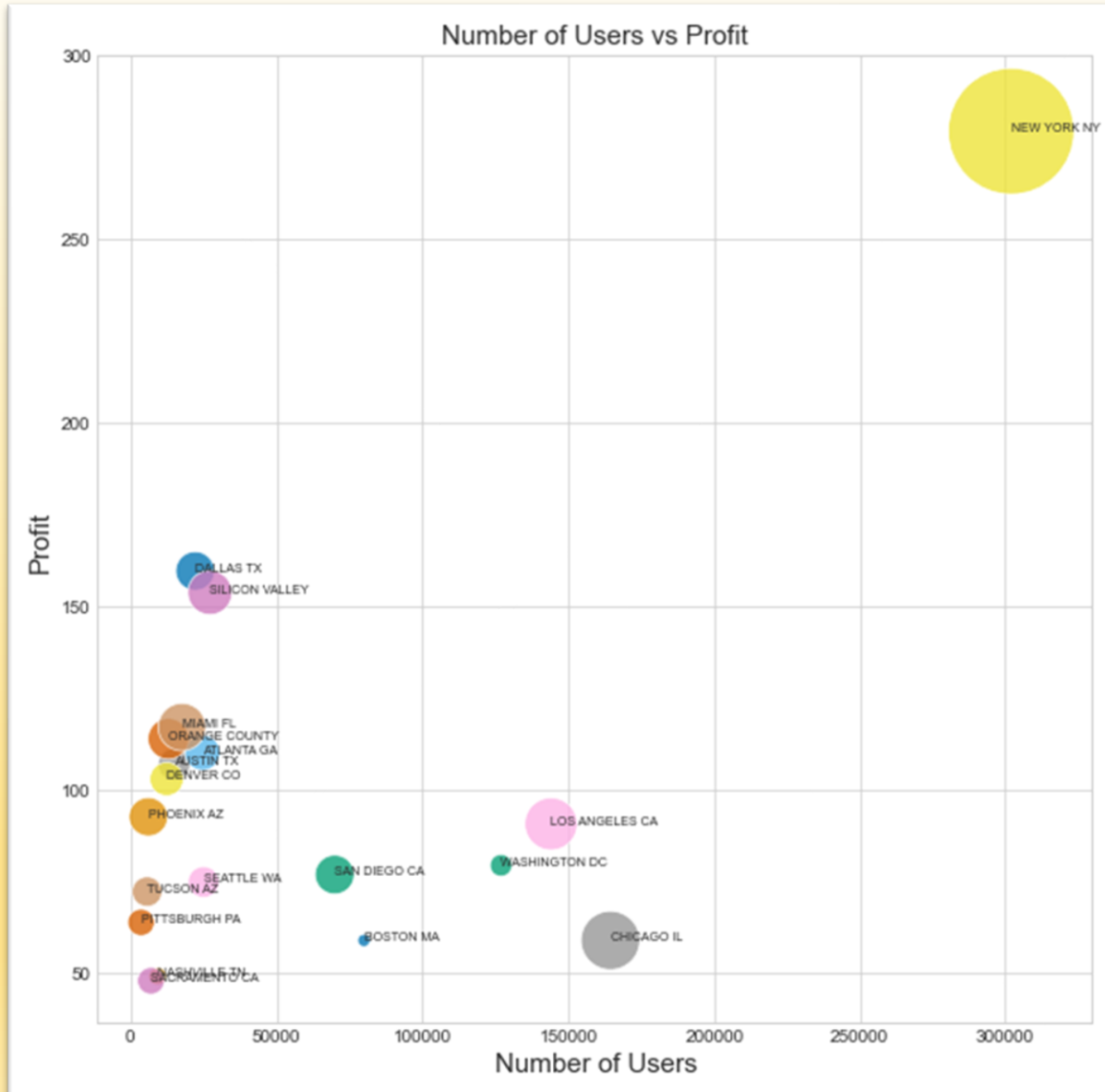
Let us take a look at how population of the cities plays a role in profit made by the companies:

Our calculations show there is a strong relationship between a city's population size and the profit made in that city (correlation : 0.83) by the cab companies.

From the graph as well, we observe that as the population of a city grows, the profit also increases.



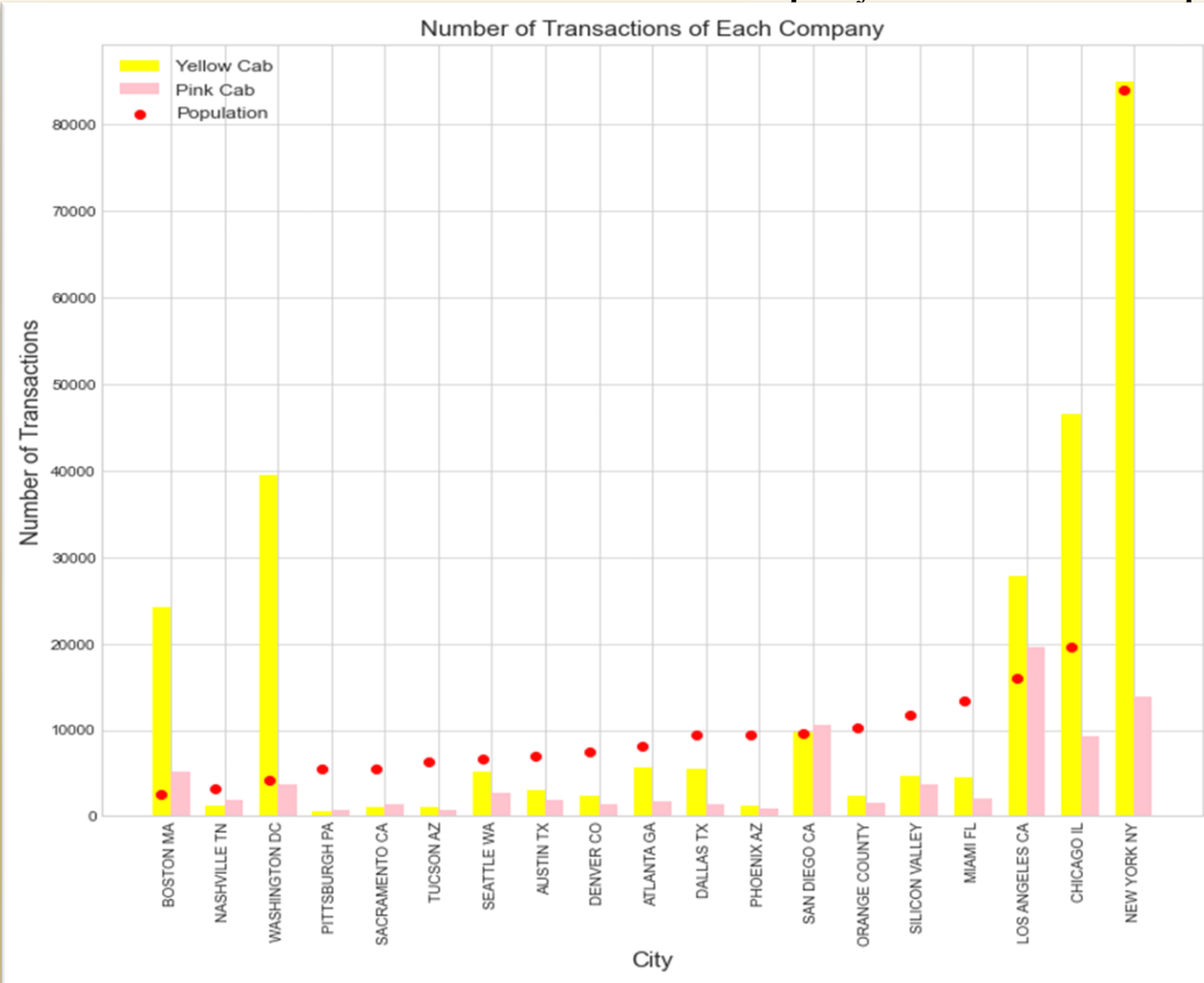
## NUMBER OF CUSTOMERS vs PROFIT



In the dataset, we are given the number of customers in each city. Our calculations (correlation: 0.53) and the graph on the left show that the number of customers in each city is not as well of an indicator of the profit as the population of the city. One reason for this may be that people in more crowded cities may be willing to pay more, due to their assumption of less cabs being available.



Let us take a look at how each cab company fare in the most populous cities:



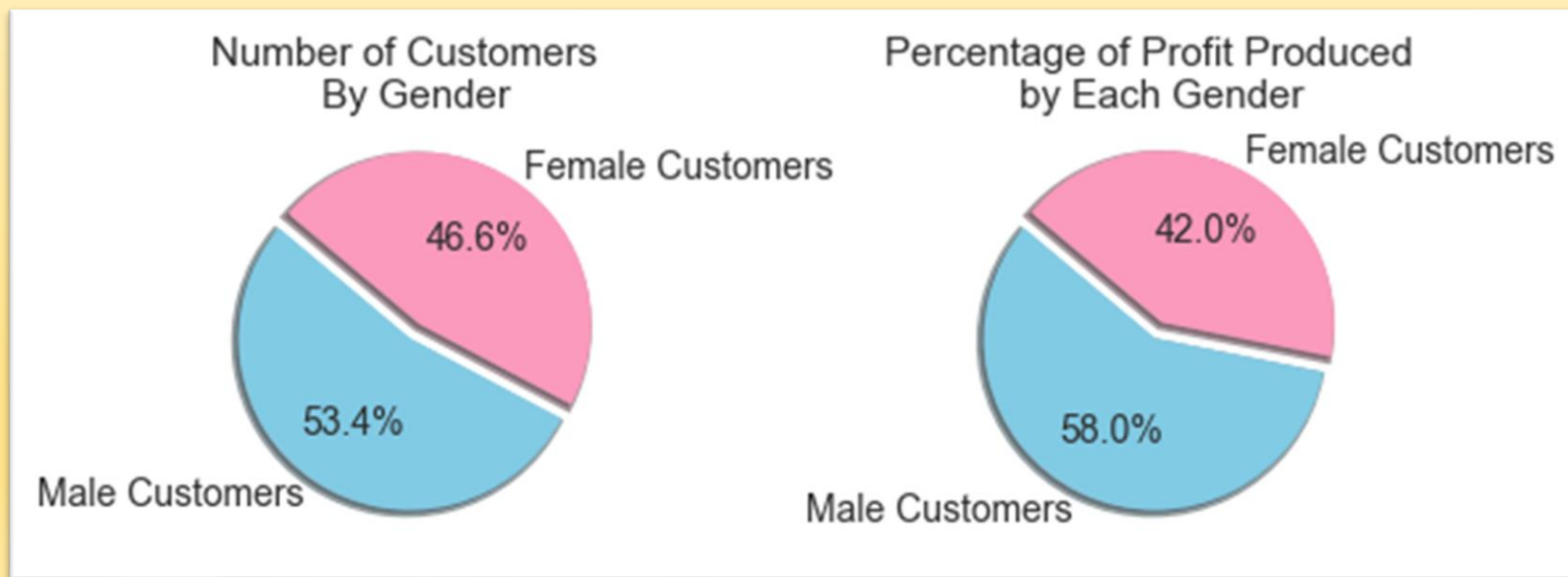
As we can see from the graph, Yellow Cab company surpasses Pink Cab company in the number of transactions in the most populous cities like New York, Chicago and Los Angeles. We would recommend XYZ company to invest in the Yellow Cab company based on the fact that Yellow Cab company would make much more profit in these populous cities than the Pink Cab company.



## Are Middle Aged Men the Most Profitable Customer Profile? If so, Which Company do They Patronize More?

**Hypothesis:** We think middle aged men would bring in more profit for the companies, as, statistically, they are known to be making more money and travelling more than the rest of the population. Also, due to social norms, they may be more likely to pay the fare when they are travelling with women.

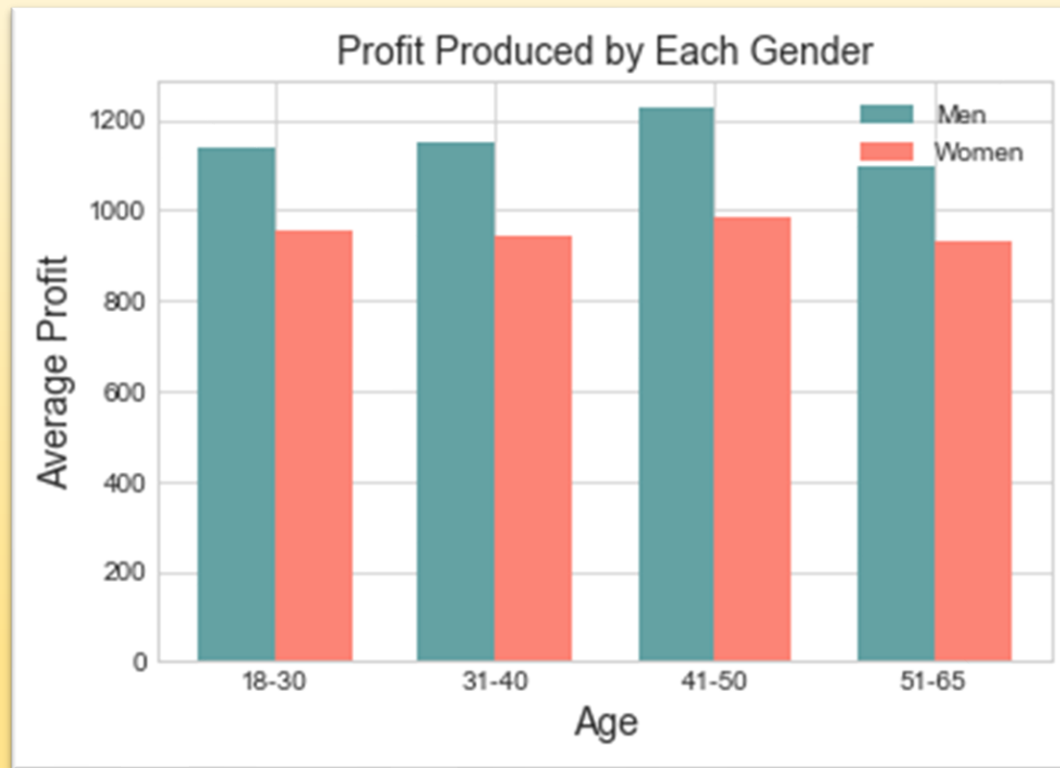
The following charts and our calculations show that more male customers use cab services than females do, as well as generating around \$200 more profit per person than their counterparts.







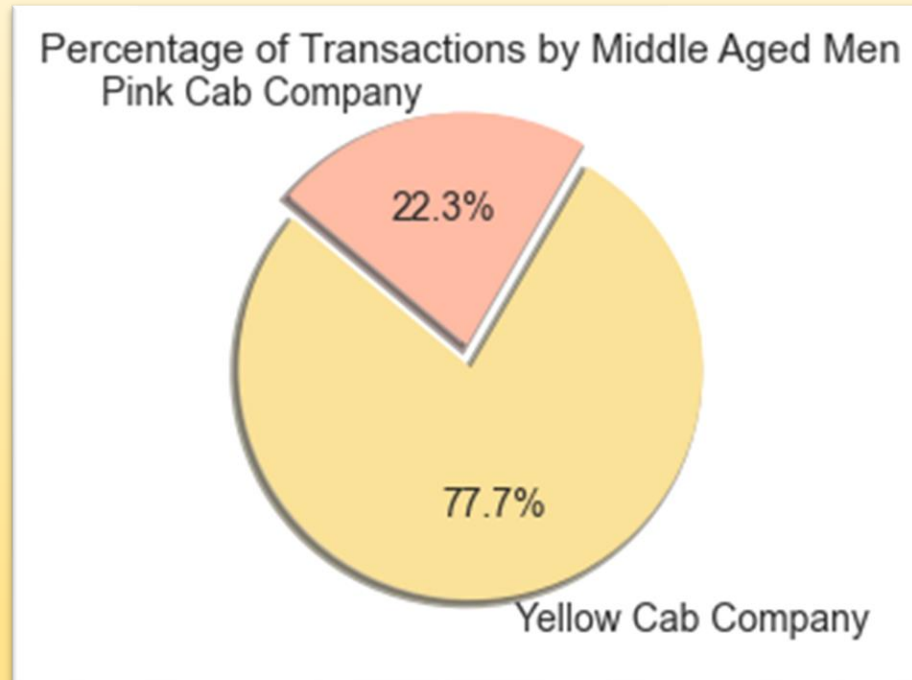
Let us see how age distribution affects profit rates for both genders:



From the graph on the left, we can infer that men ages between 41 and 50 produce more profit than the rest of the groups, proving our hypothesis true.



**Which Cab company do middle aged men use more frequently?**

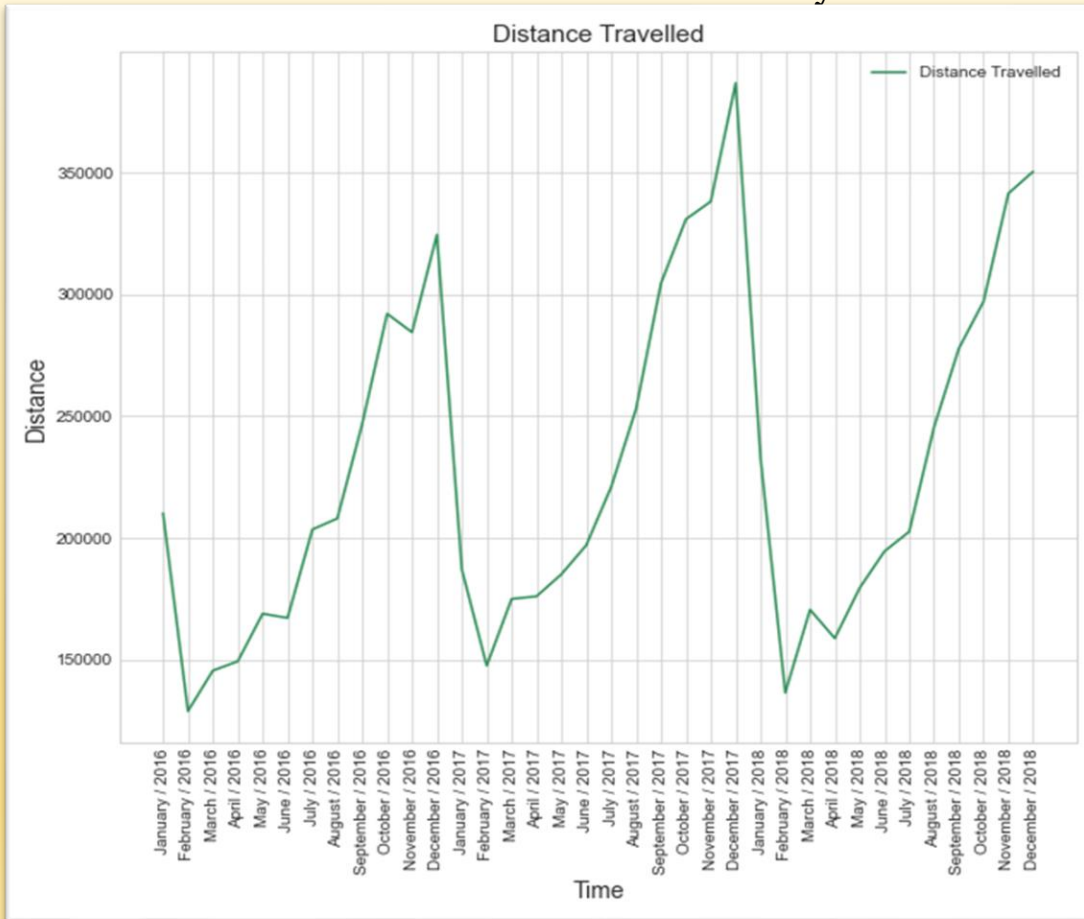


Since middle aged men is the most profitable customer profile and more than 77% of all transactions by middle aged men is with the Yellow Cab company, we can confidently advise XYZ company to invest in Yellow Cab company.



### Do People Travel More During Summer Months? Which Company Attracts More Customers During the Busiest Months?

**Hypothesis:** People would use cab services more during summer months, as these cities may offer many attractions for out of town tourists.



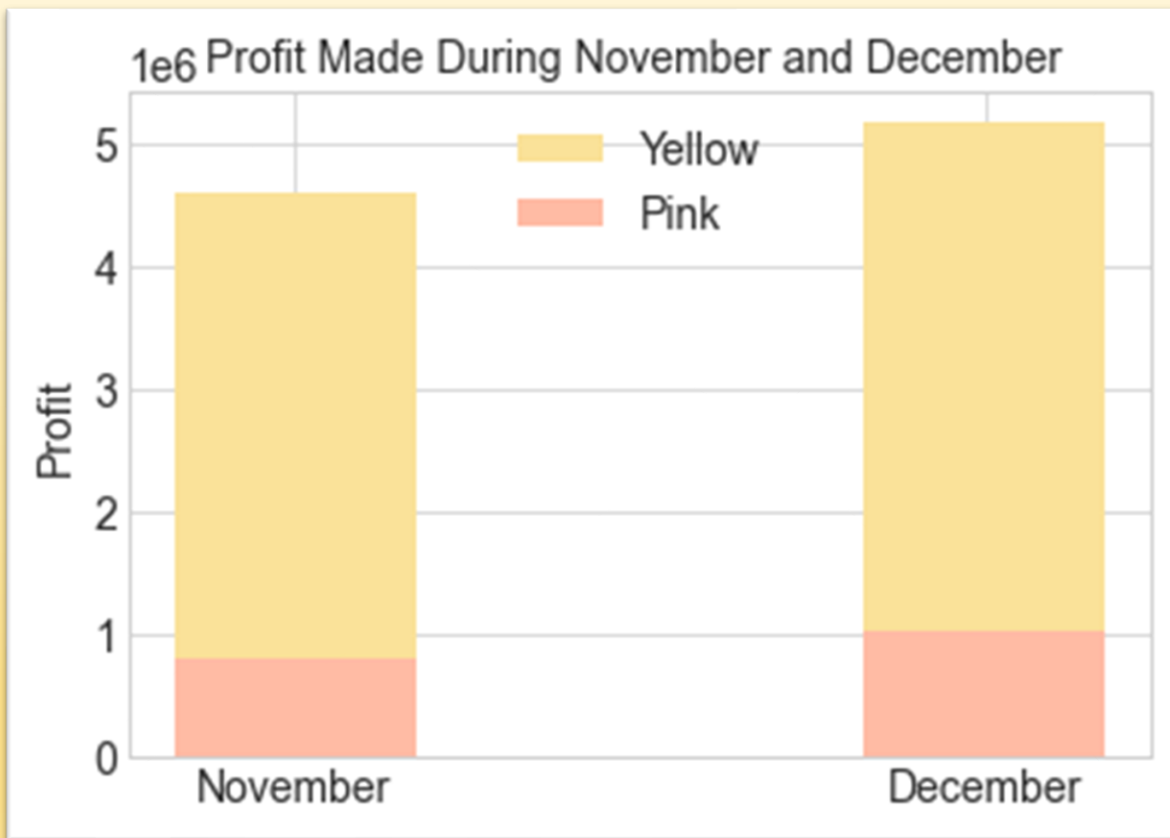
Our calculations show that there is strong relationship between the month of the year and the distance travelled by cabs (correlation: 0.87). However, from the graph, we see our hypothesis is actually not true.

February seems to be the least busy time for cab drivers, then the travelling starts increasing during summer months. The busiest time seems to be the months of November and December, which makes sense, since people do their Christmas shopping during these months and travel more during Thanksgiving and Christmas Holidays.



## MOST PROFITABLE MONTHS OF THE YEAR

Let us take a look at the profits made by each cab company during the months of November and December:

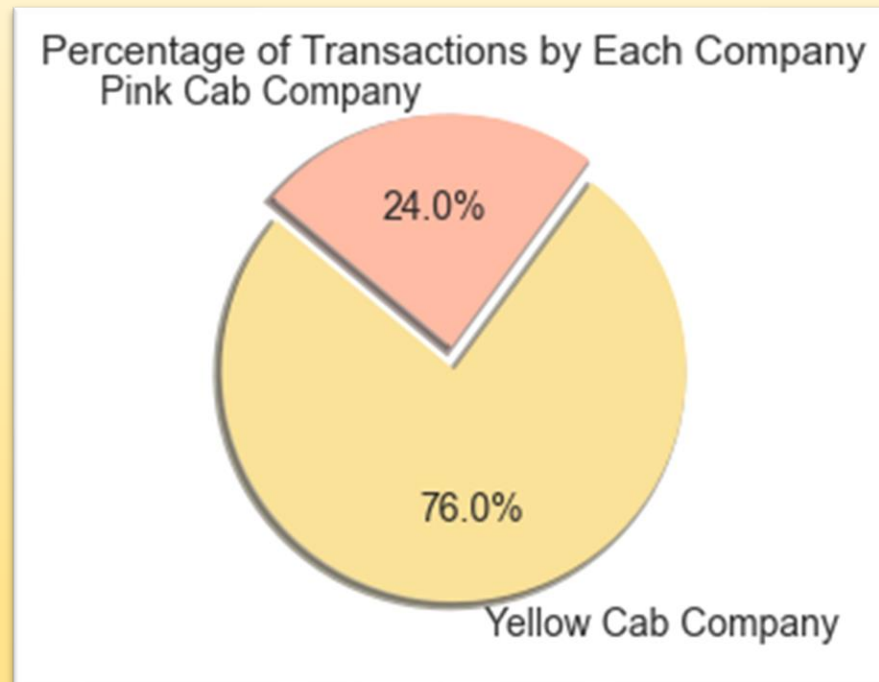


Yellow Cab's profit is around 5 times that of Pink Cab's during the busiest months. So, we would recommend XYZ company to invest in Yellow Cab Company.



## Which Company Dominates the Industry?

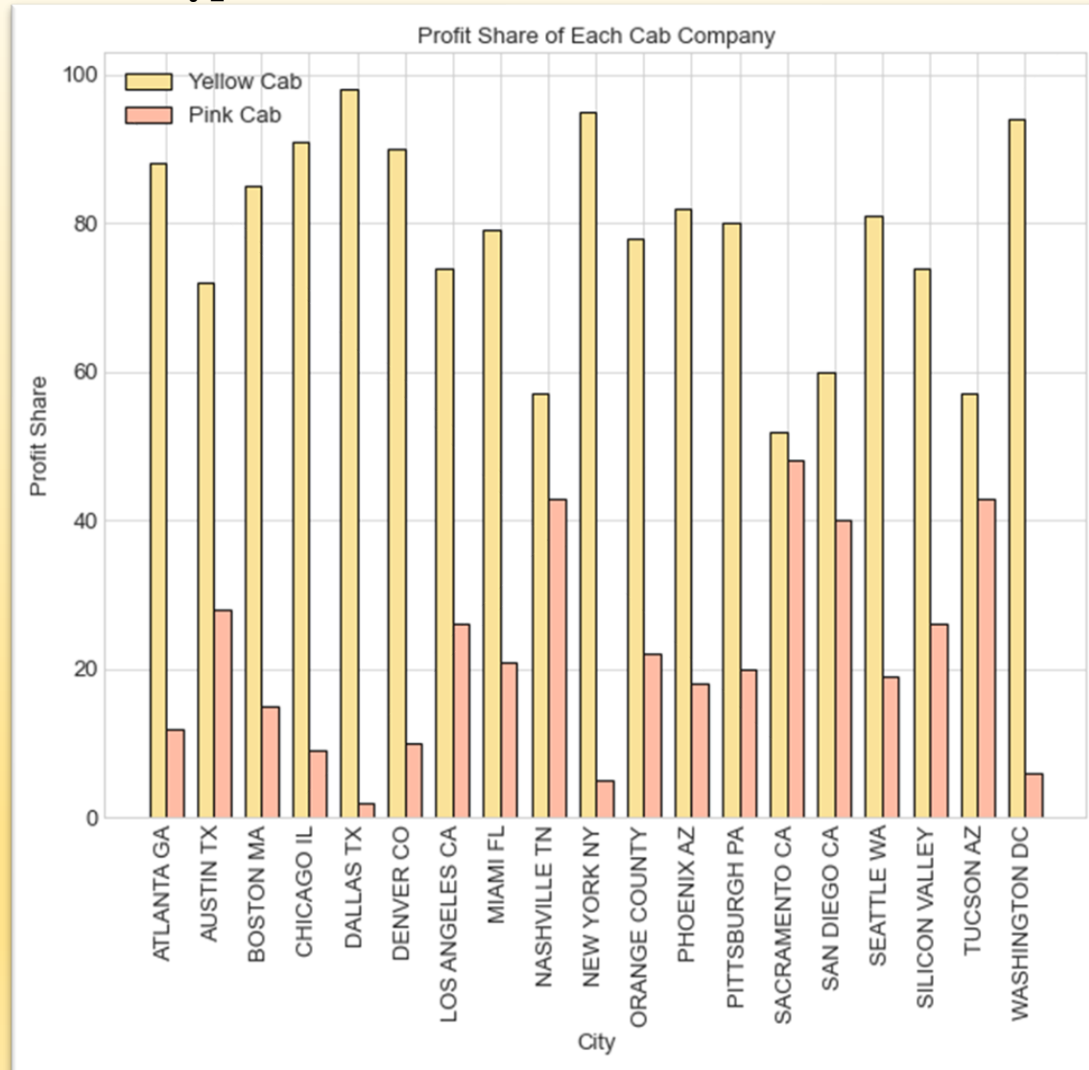
**Hypothesis: We think Yellow Cab company dominates the industry.**



**Only about one fourth of the transactions come from the Pink Cab company. Yellow Cab company heavily dominates the industry proving our hypothesis.**



Is the hypothesis true across all cities?



In all of the cities, Yellow Cab Company has the bigger share of the profit.

Based on our analysis, we proved the hypothesis that the Yellow Cab Company dominates the industry both in general and across all cities.

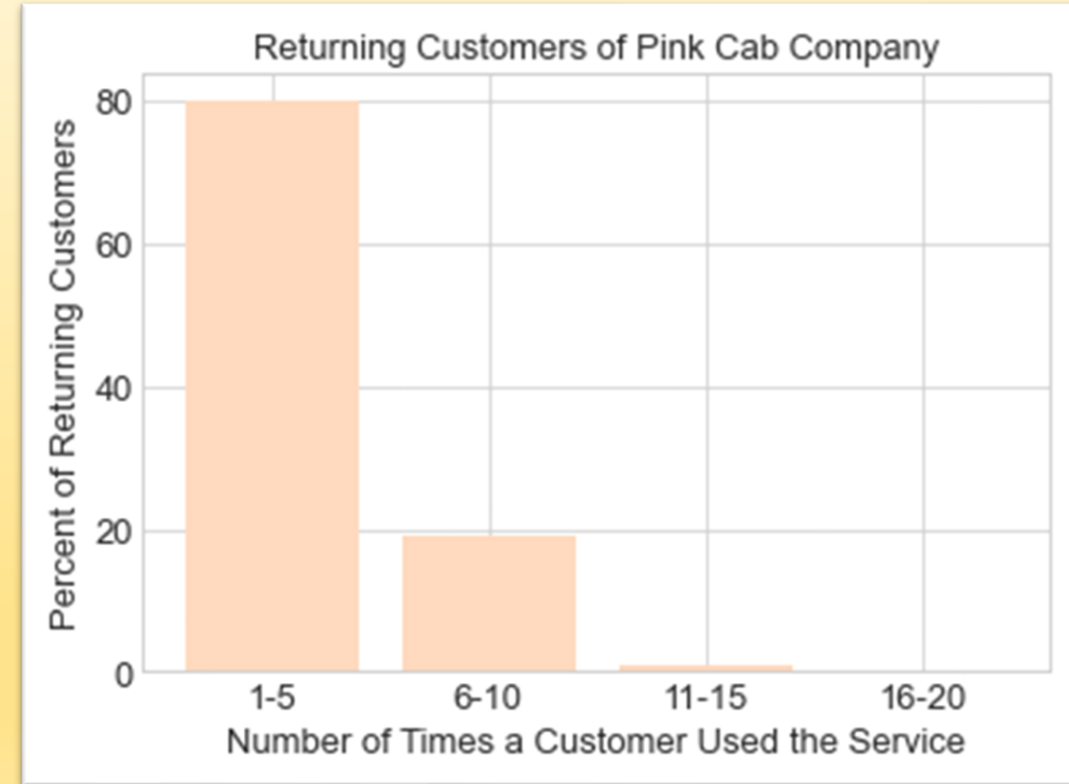
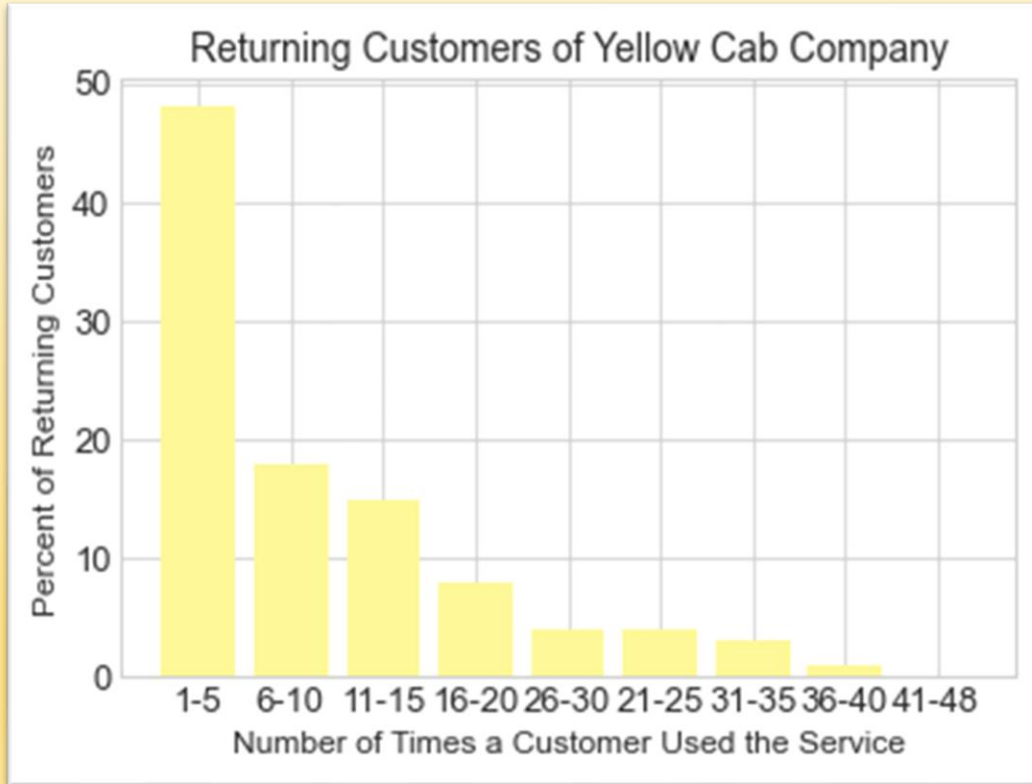
Therefore, we would recommend XYZ company to invest in the Yellow Cab company.



### Which Company's Customers are More Loyal?

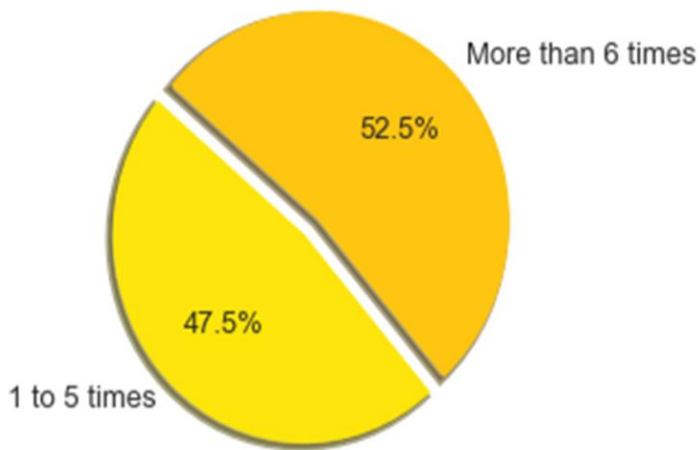
**Hypothesis:** So far, we observed Yellow Cab is much more successful than the Pink Cab. Therefore, we claim that they would retain more customer loyalty than the Pink Cab company.

**Returning customers of each company:**

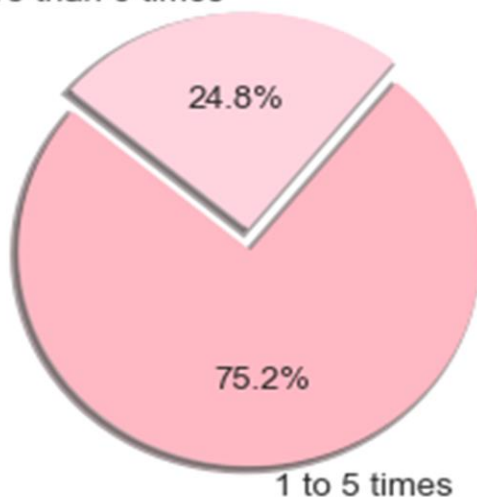




Number of Times Customers Used Yellow Cab



Number of Times Customers Used Pink Cab



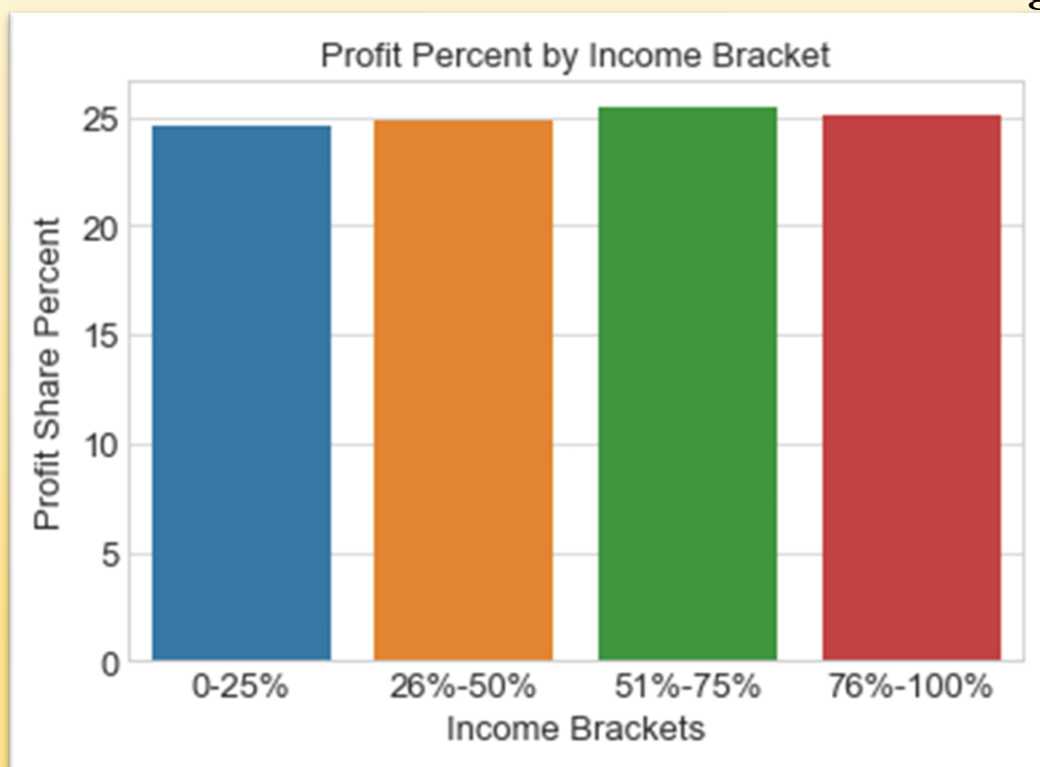
Around 75% of the customer base of the Pink Cab company used the service 1 to 5 times. Only 25% of the customer base used the service more than six times. On the other hand, 47% of the customer base of Yellow Cab used the service 1 to 5 times and 53% of the customer base used the service more than six times. It seems like Yellow Cab company's customers are much more loyal to the company than Pink Cab company's customers. We would recommend XYZ company to invest in the Yellow Cab Company based on this result.





### Do People Earning More Bring in More Profit?

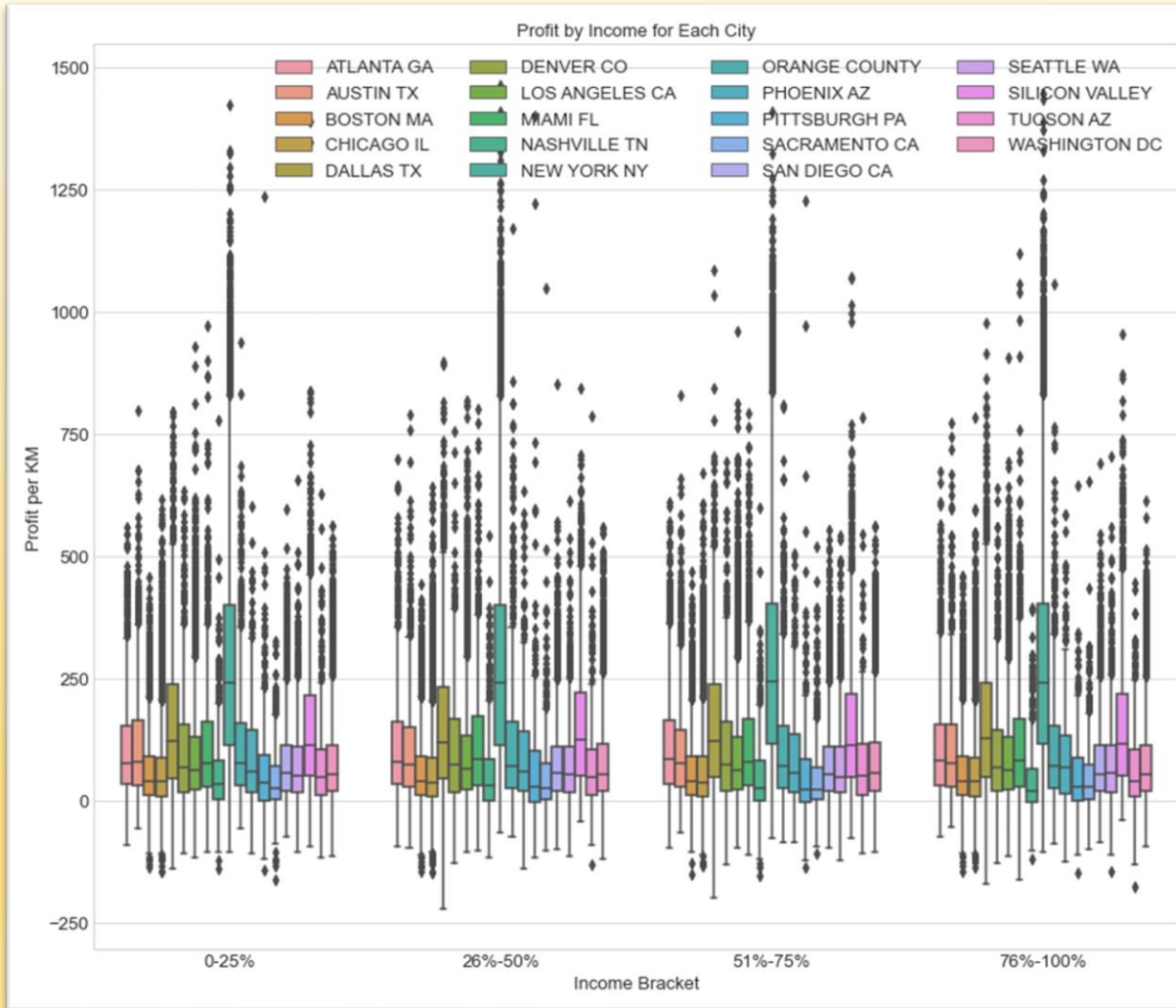
**Hypothesis:** We believe higher portion of the profit would come from people whose income are in the higher bracket.



There is a slight increase in the 51%-75% quartile, but the difference is not enough to claim that income differences affect profit.



Is this true across all cities?

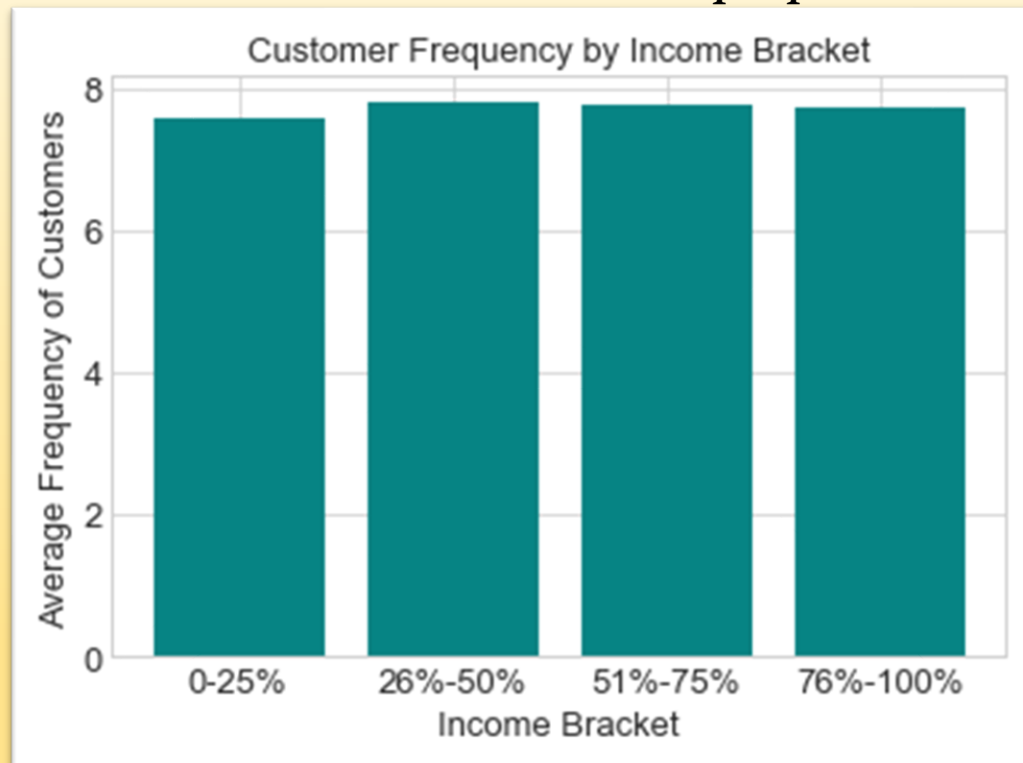


From the graph, again we see no correlation between income and profit. So we cannot make a recommendation to XYZ company on which company to invest in based on the income brackets of the customers.



### Do People Earning More Use Cabs More Frequently?

**Hypothesis:** People in higher income brackets may use the cab service more frequently than people in lower income brackets.



Across all income brackets, on average, a customer uses the cab service around seven times. There seems to be no relationship between a customer's income and how frequently they use the service. So, we can not make a recommendation based on this either.



# Conclusion

**Based on our analysis, we firmly believe that the Yellow Cab company is much more successful, ubiquitous, and highly profitable than the Pink Cab company. We would definitely recommend XYZ firm to invest in the Yellow Cab company.**

**Thank you**