Data Glacier

Your Deep Learning Partner

Project:G2M Insight for Cab Investment

Data Glacier Virtual Internship

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13th August 2023

Agenda

Problem Statement

Dataset information

EDA

Hypothesis Testings

Findings

Problem Statement

XYZ is a private firm in US. Due to remarkable growth in the Cab Industry in last few years and multiple key players in the market, it is planning for an investment in Cab industry and as per their Go-to-Market(G2M) strategy they want to understand the market

Objective: Provide insight to help XYZ in identifying the right company to invest in.

Analysis done:

1. Problem Understanding
2. Finding users in companies
3. Finding profit for both companies
4. Finding cheaper company
5. Multiple hypothesis Testing

DataSet Information

The dataset contains 4 individual dataset

1. Cab_data: Contains 7 columns and 359392 observations, containing company type, price,km travelled.
2. City: This file contains 3 columns and 20 observations, containing city and their respective users.
3. customer_data: This file contains 4 columns and 49171 observations. containing users and their respective age, gender and income
4. Transaction_data: This file contains 3 columns and 440098 observations containing mode of payment for a particular customer.

Combining Dataset to form a complete merged dataset:

- Combining transaction and customer data on column ‘Customer ID’.
- Then combine it with cab data on column ‘Transaction ID’.
- Then combine it with city data on column ‘City’
- In combined dataset created a new column users per meaning dividing the users by total population.

DataSet Information (contd...)

Combined dataset Details:

Contains 20 columns and 359392 observations.

```
 Data columns (total 19 columns):
 #   Column             Non-Null Count   Dtype
---  ------             --------------   -----
 0   Transaction ID      359392 non-null  int64
 1   Customer ID         359392 non-null  int64
 2   Payment_Mode        359392 non-null  object
 3   Gender              359392 non-null  object
 4   Age                 359392 non-null  int64
 5   Income (USD/Month)  359392 non-null  int64
 6   Date of Travel      359392 non-null  object
 7   Company             359392 non-null  object
 8   City                359392 non-null  object
 9   KM Travelled        359392 non-null  float64
 10  Price Charged       359392 non-null  float64
 11  Cost of Trip        359392 non-null  float64
 12  Population          359392 non-null  int64
 13  Users               359392 non-null  int64
 14  Year                359392 non-null  int64
 15  Month               359392 non-null  int64
 16  Day                 359392 non-null  int64
 17  Profit              359392 non-null  float64
 18  users per           359392 non-null  float64
dtypes: float64(5), int64(9), object(5)
```

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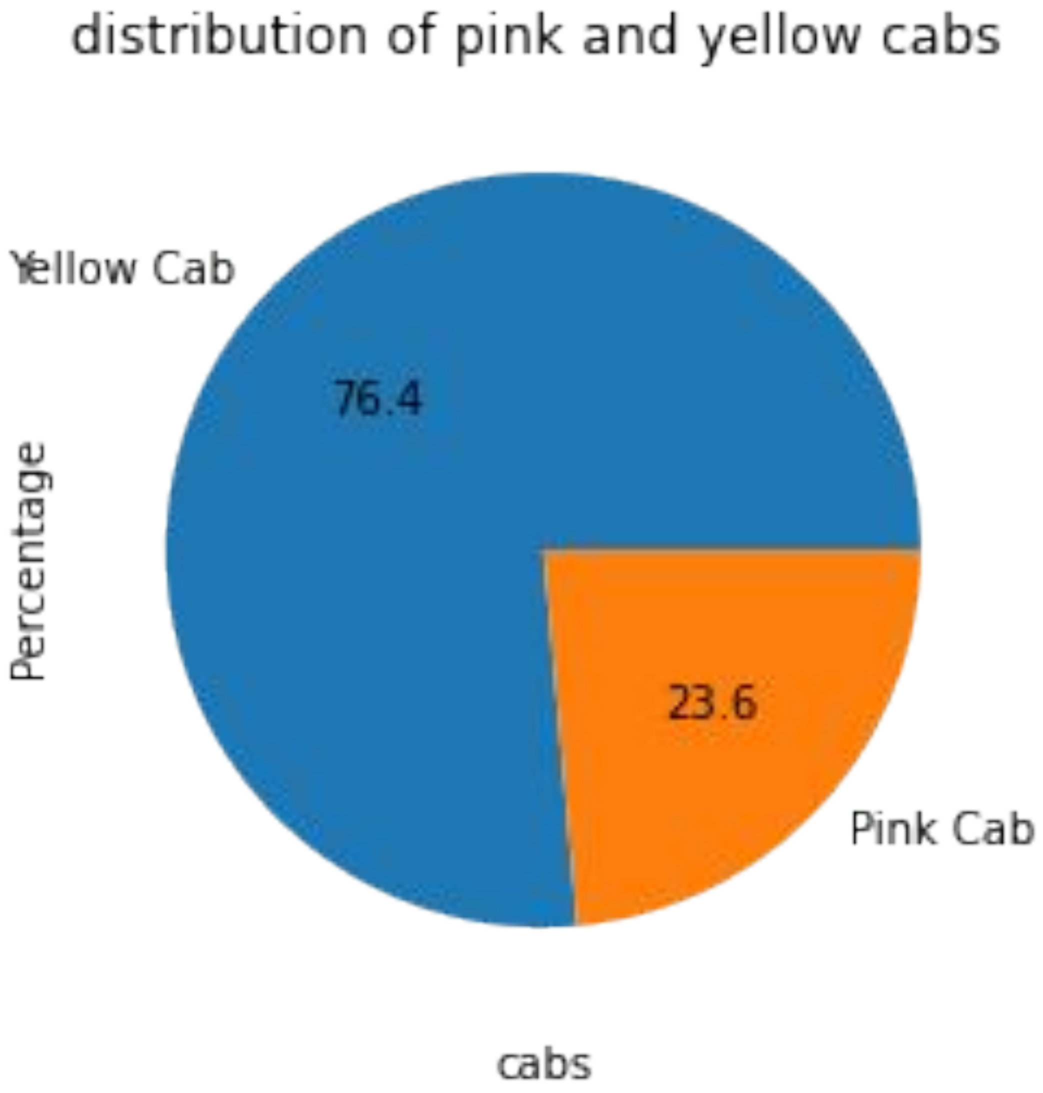
EDA

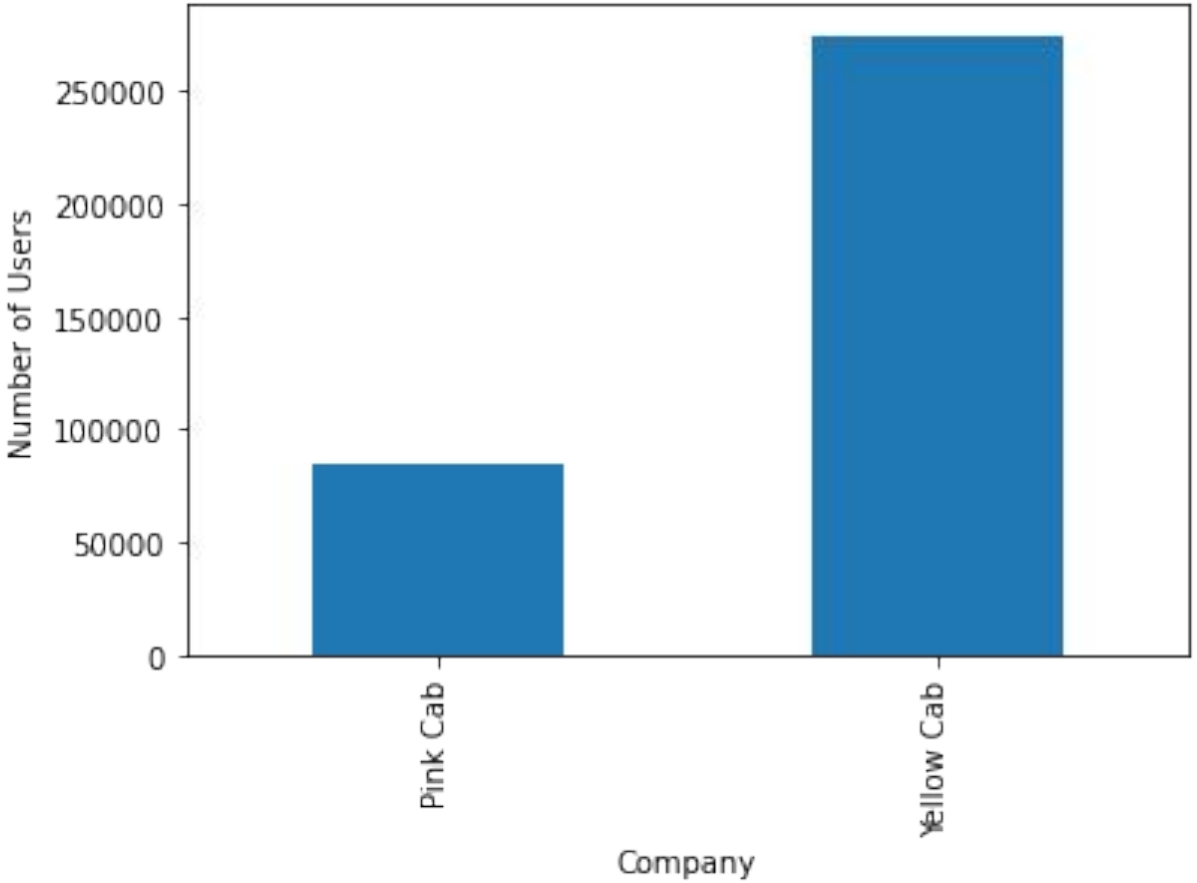
Which company has more cabs ?

Yellow Cab



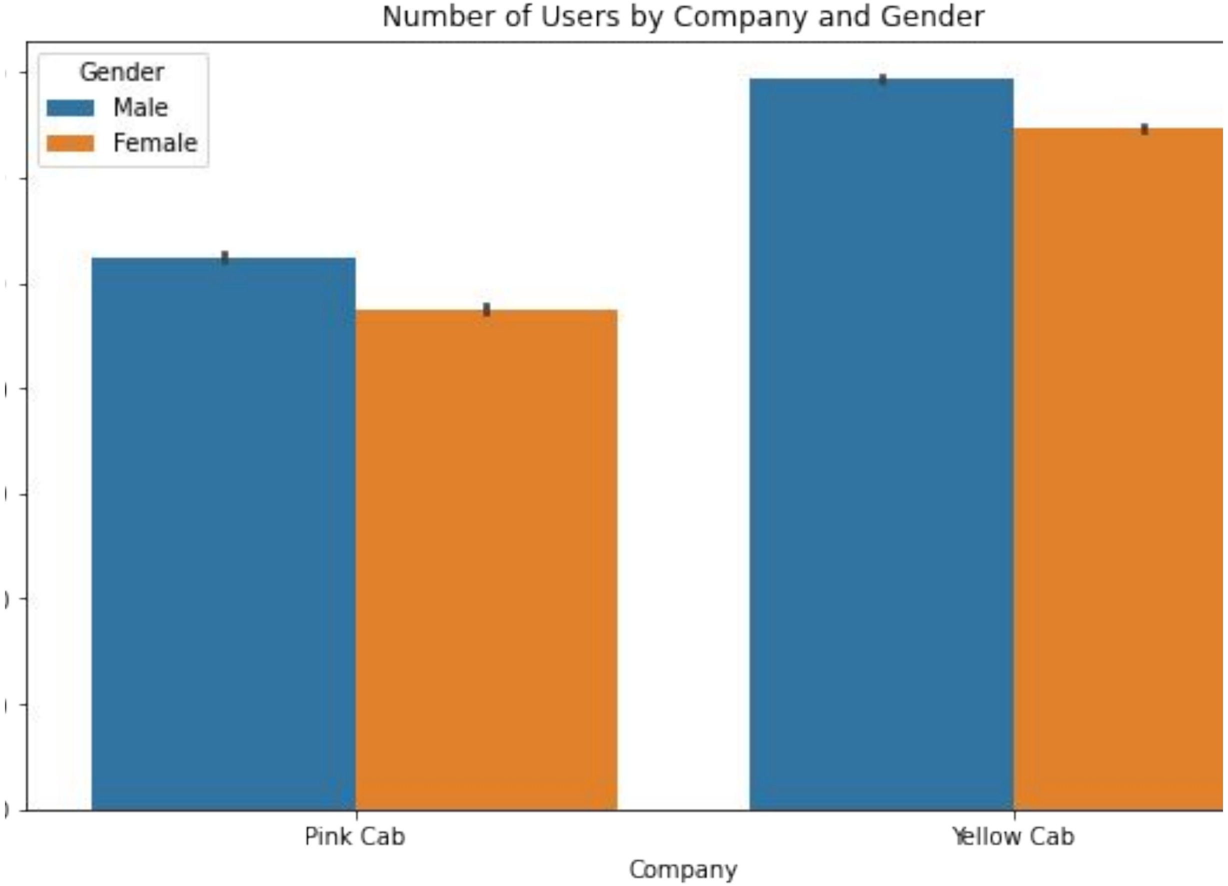
Which company has more users?

Yellow Cab has more users



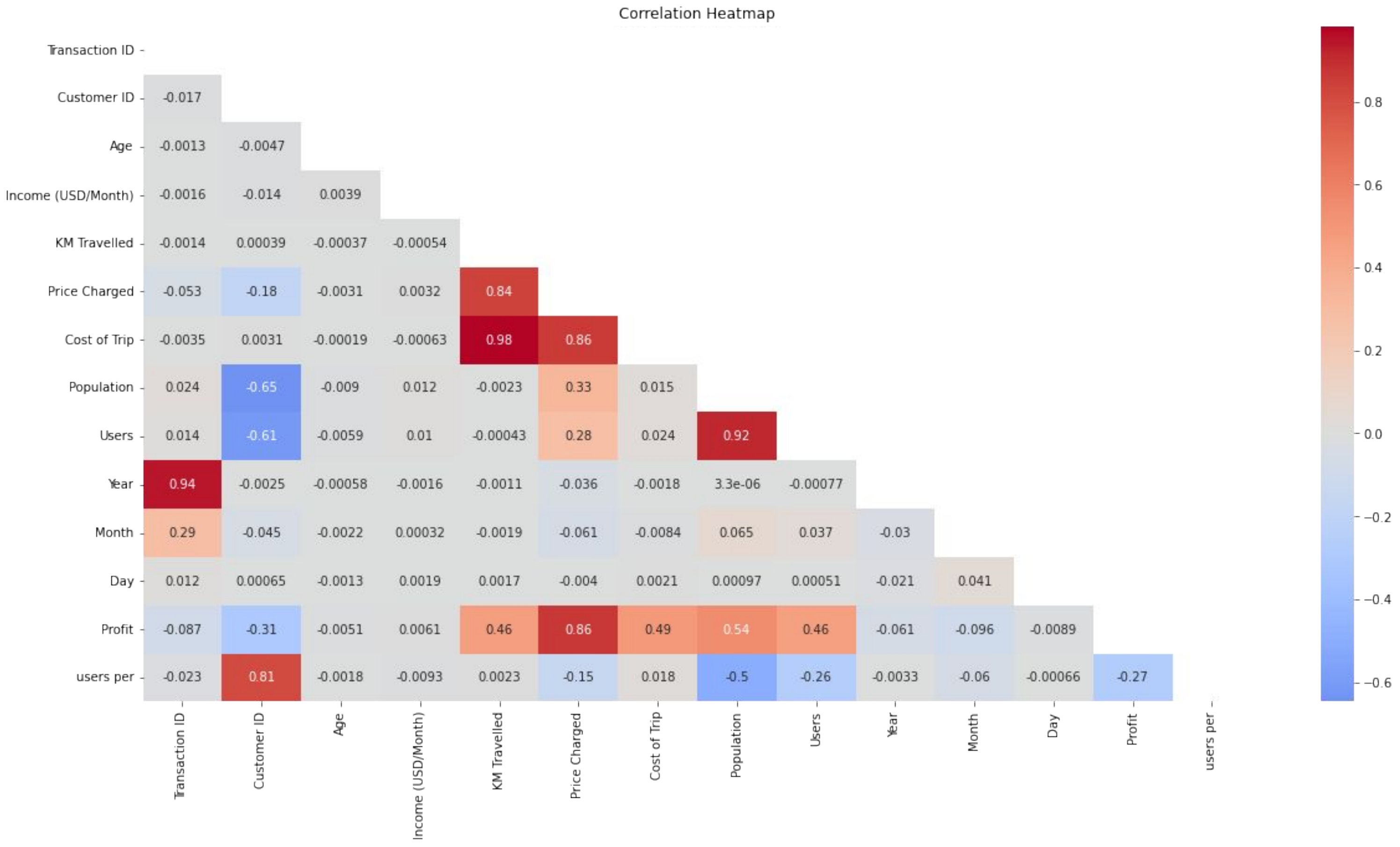
Which company has more users w.r.t Gender?

There are more male than female users for both company



Checking Correlation

1. Population vs Users.
2. Price charged vs Cost of trip vs Profit
3. Km travelled vs Price Charged



Correlation Heatmap

	Transaction ID	Customer ID	Age	Income (USD/Month)	KM Travelled	Price Charged	Cost of Trip	Population	Users	Year	Month	Day	Profit	users per
Transaction ID														
Customer ID	-0.017													
Age	-0.0013	-0.0047												
Income (USD/Month)	-0.0016	-0.014	0.0039											
KM Travelled	-0.0014	0.00039	-0.00037	-0.00054										
Price Charged	-0.053	-0.18	-0.0031	0.0032	0.84									
Cost of Trip	-0.0035	0.0031	-0.00019	-0.00063	0.98	0.86								
Population	0.024	-0.65	-0.009	0.012	-0.0023	0.33	0.015							
Users	0.014	-0.61	-0.0059	0.01	-0.00043	0.28	0.024	0.92						
Year	0.94	-0.0025	-0.00058	-0.0016	-0.0011	-0.036	-0.0018	3.3e-06	-0.00077					
Month	0.29	-0.045	-0.0022	0.00032	-0.0019	-0.061	-0.0084	0.065	0.037	-0.03				
Day	0.012	0.00065	-0.0013	0.0019	0.0017	-0.004	0.0021	0.00097	0.00051	-0.021	0.041			
Profit	-0.087	-0.31	-0.0051	0.0061	0.46	0.86	0.49	0.54	0.46	-0.061	-0.096	-0.0089		
users per	-0.023	0.81	-0.0018	-0.0093	0.0023	-0.15	0.018	-0.5	-0.26	-0.0033	-0.06	-0.00066	-0.27	

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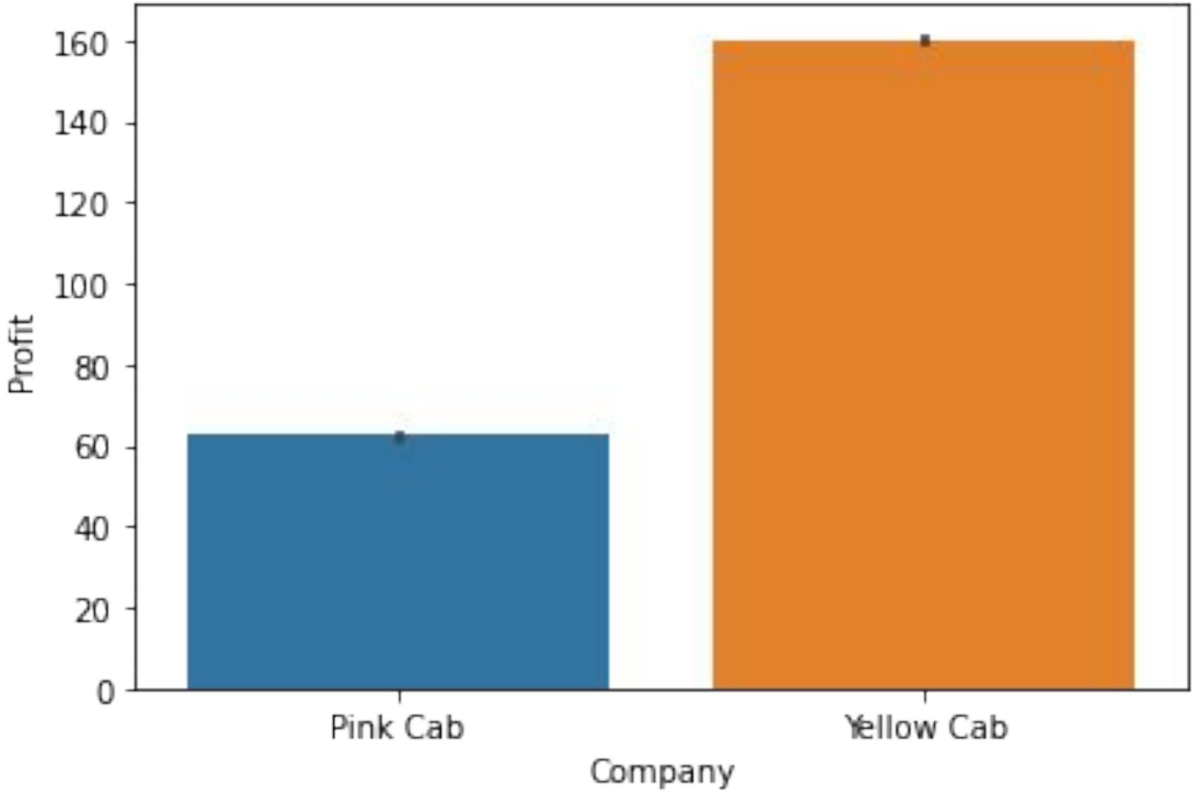
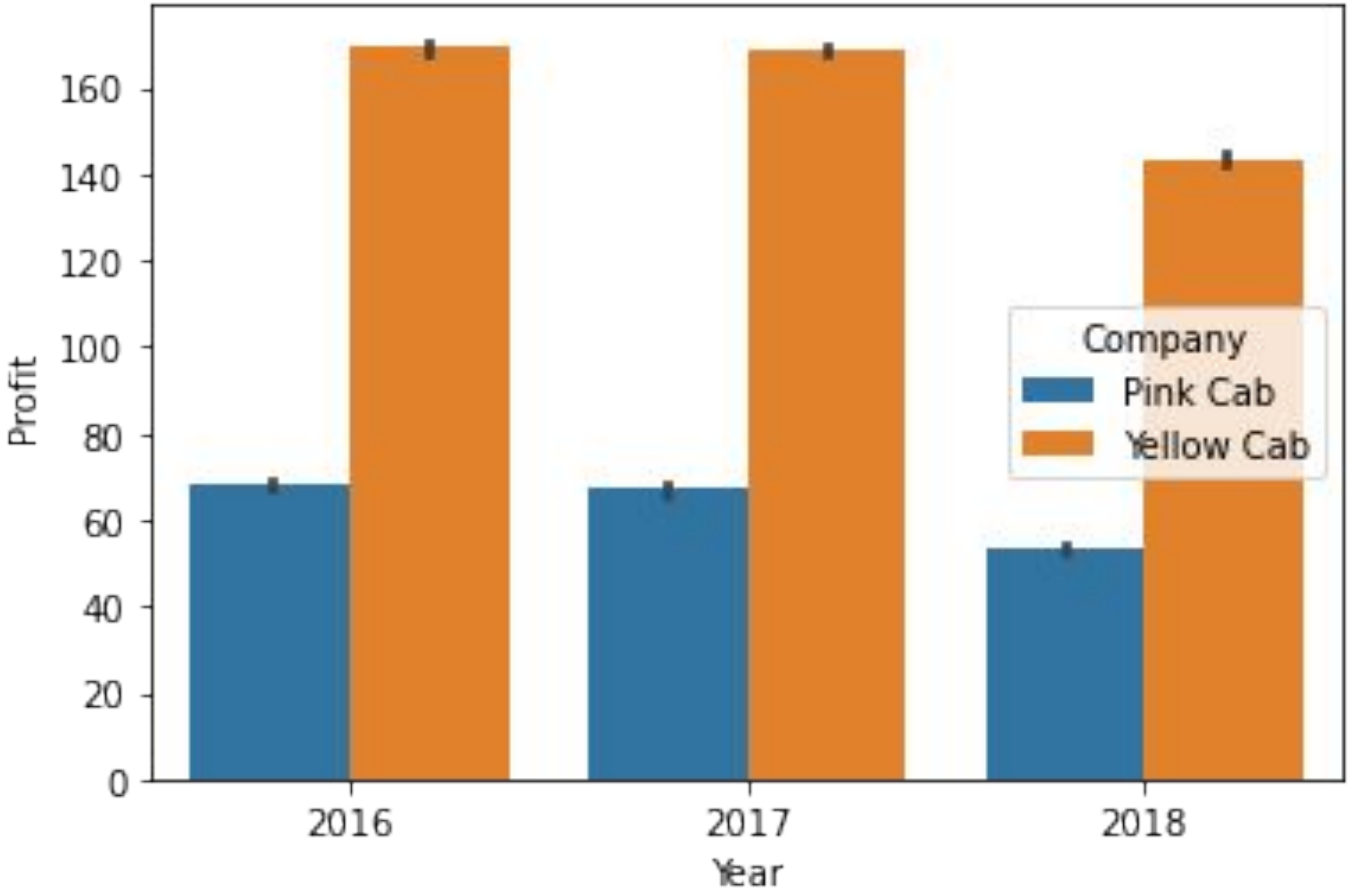
Which company has more profit

Yellow cab has more profit than pink cab



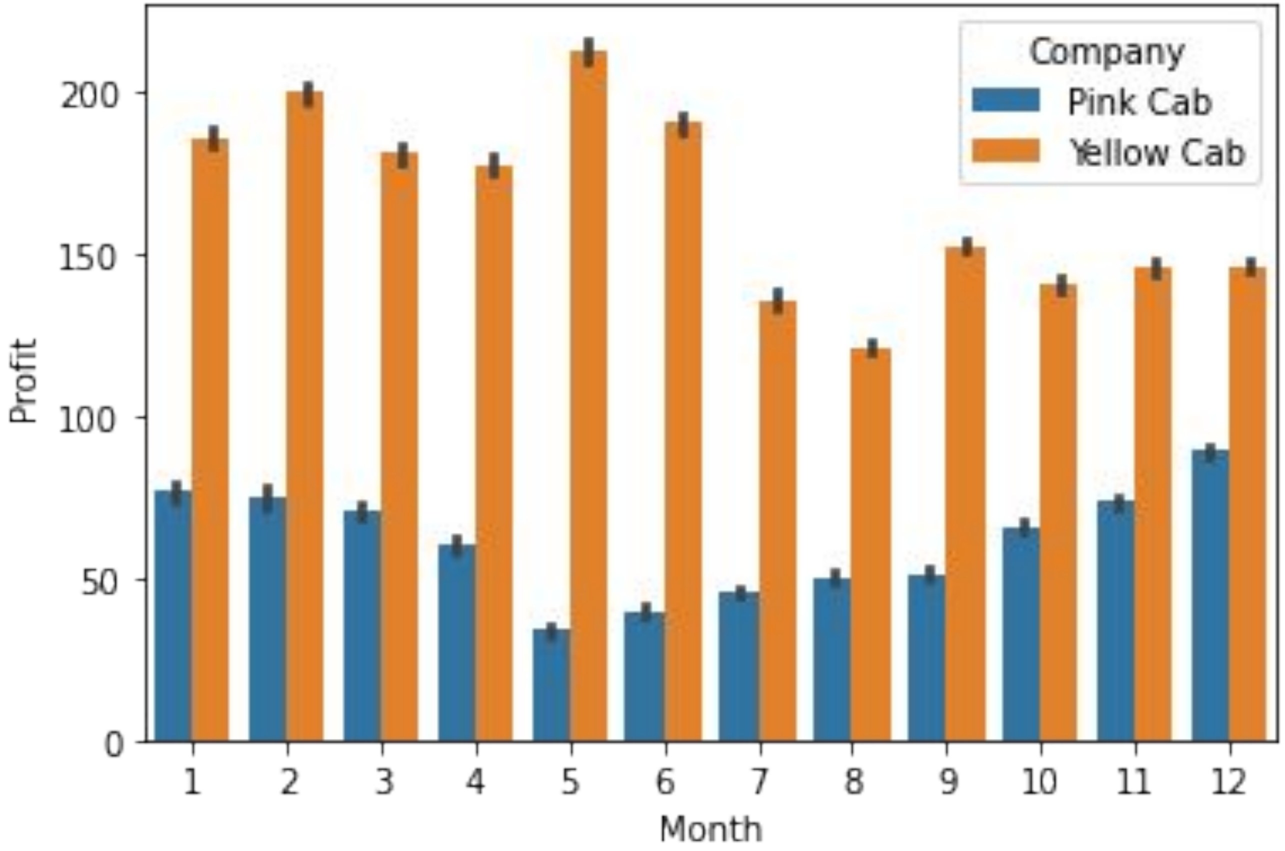
Seeing the profit year wise for both the companies

2018 has least profit for both companies



Seeing the profit month wise for both the companies

Yellow cab has highest profit for month of May, Pink cab has highest profit from month December



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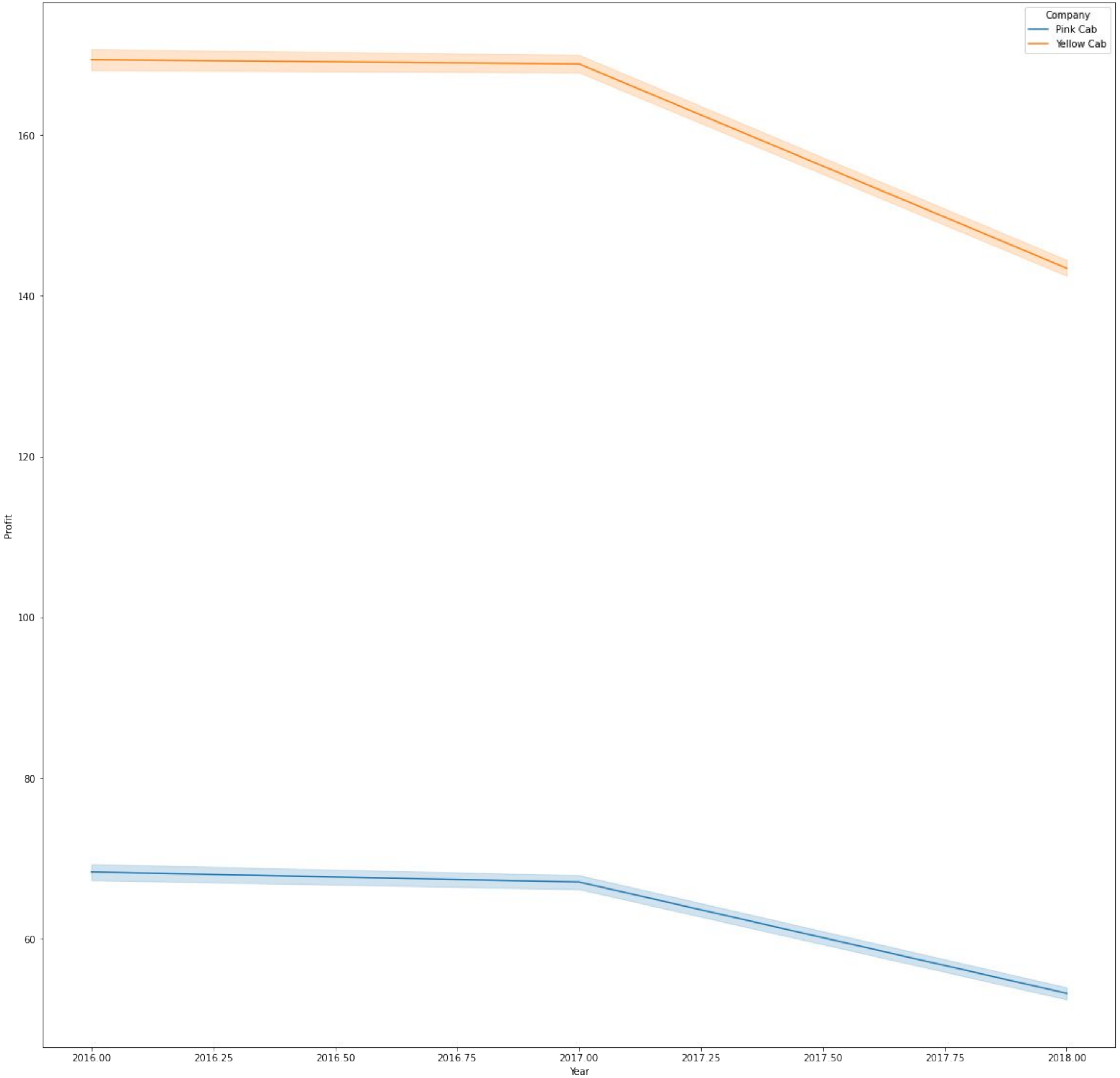
Profit w.r.t Year

We can see that profit is decreasing for both company year wise



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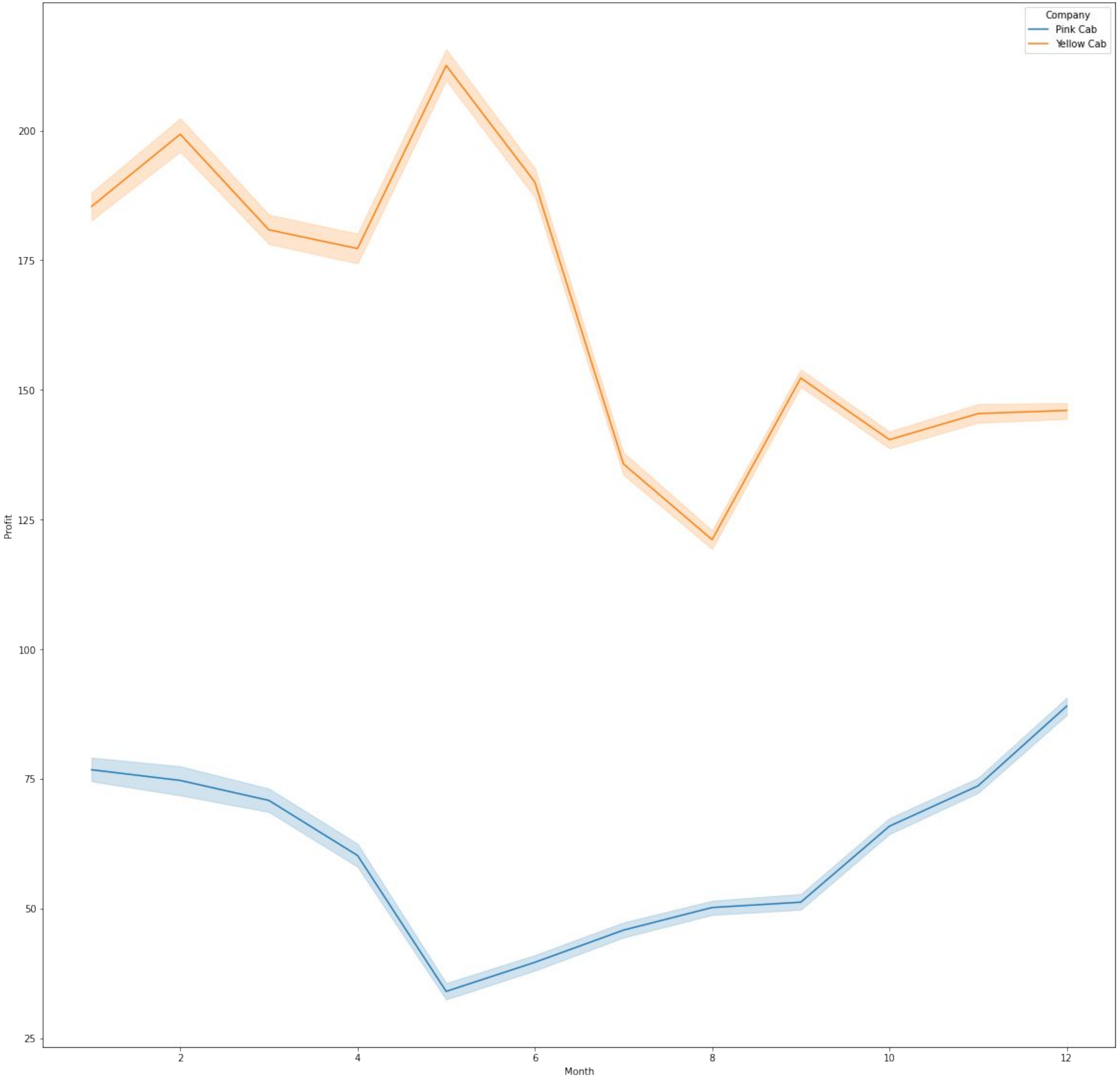
Profit w.r.t Month



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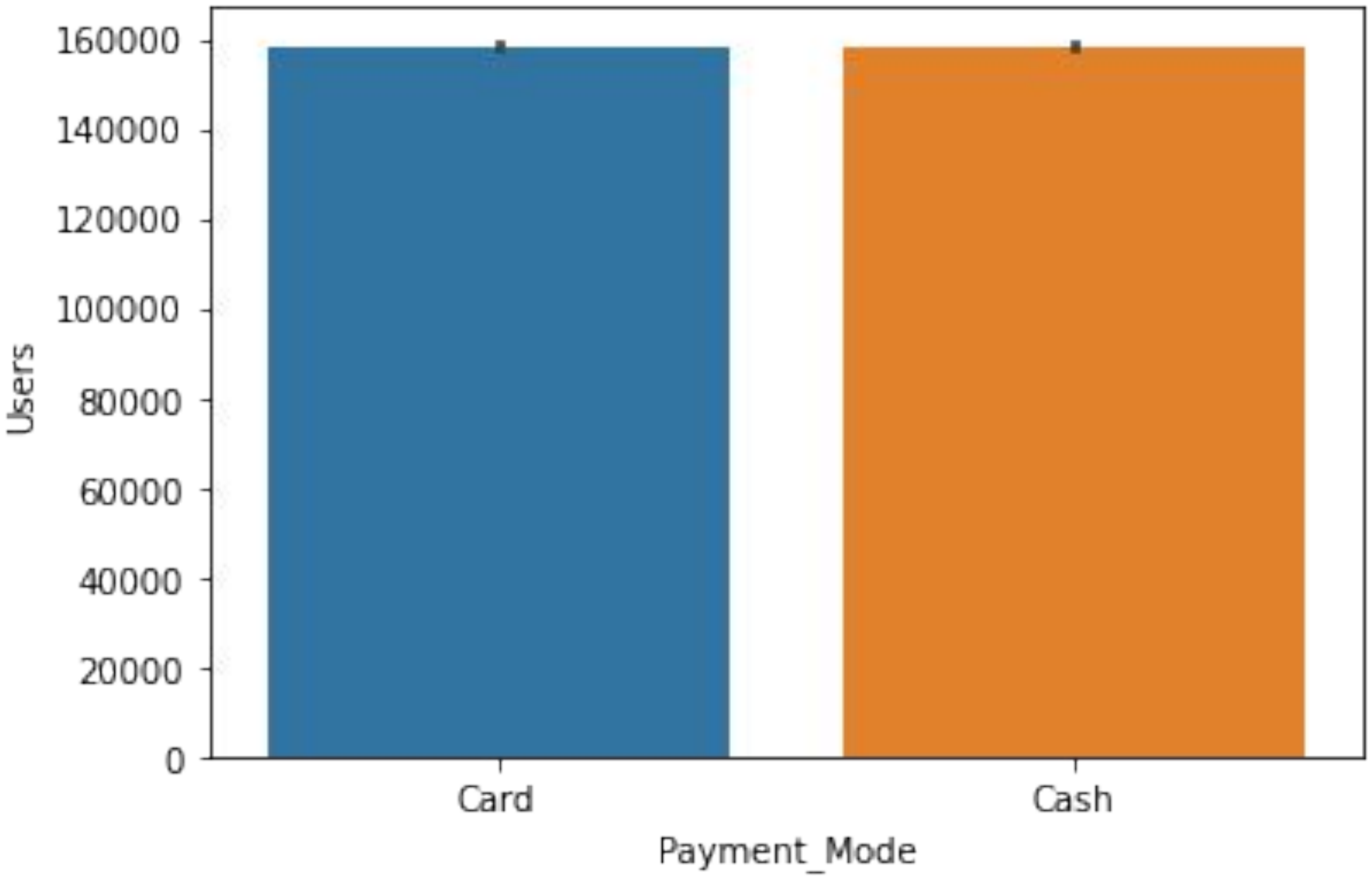
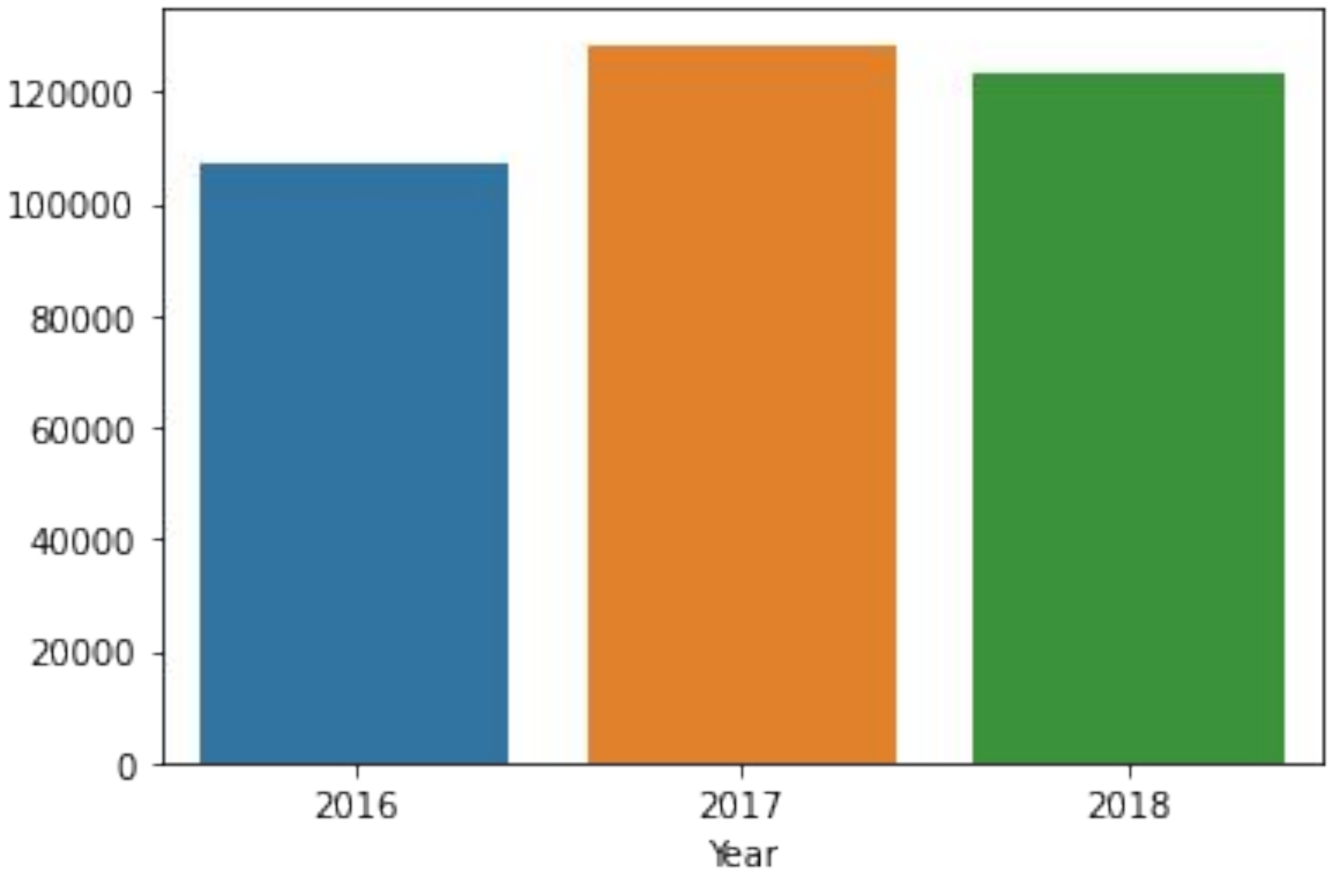
Payment mode for both companies

Equal users using both modes of payment



Travel frequency per year

2017 has highest tavel



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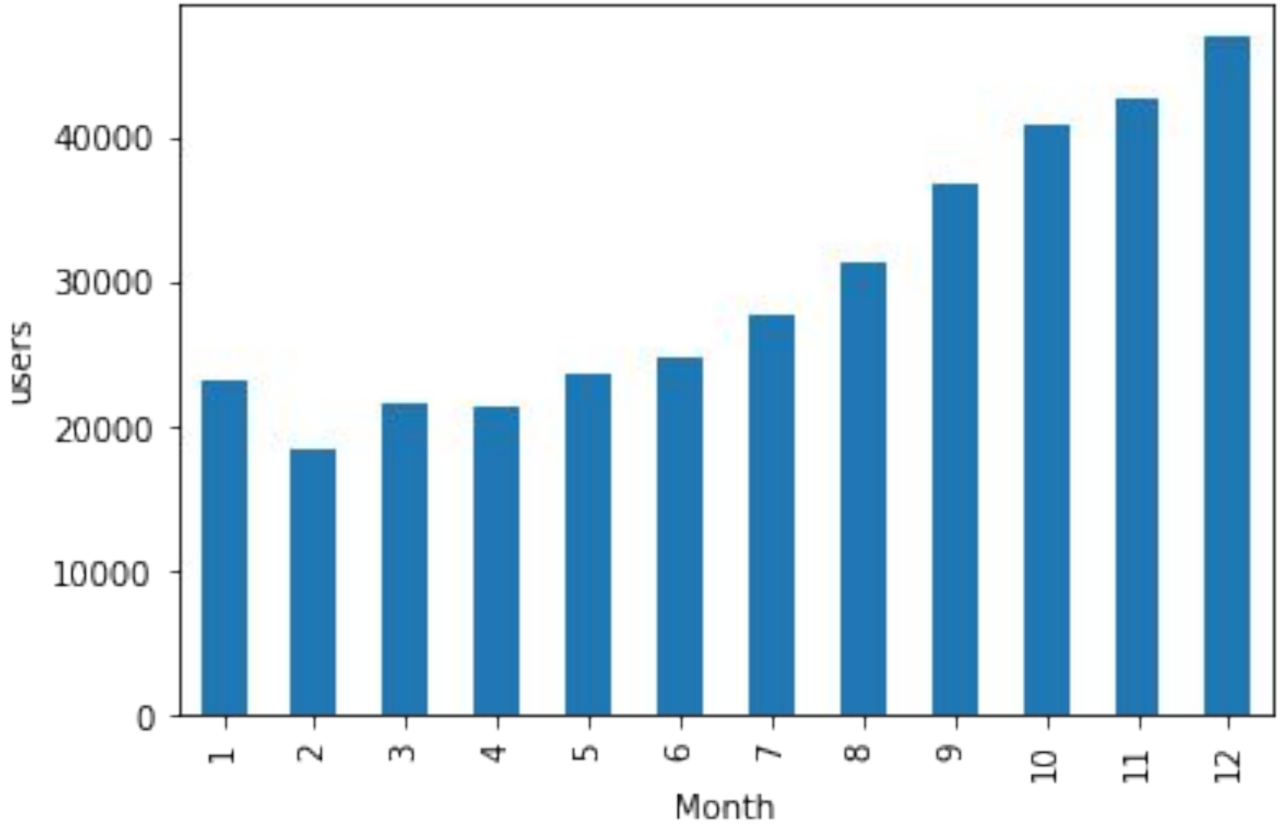
Travel frequency per month

December has highest tavel



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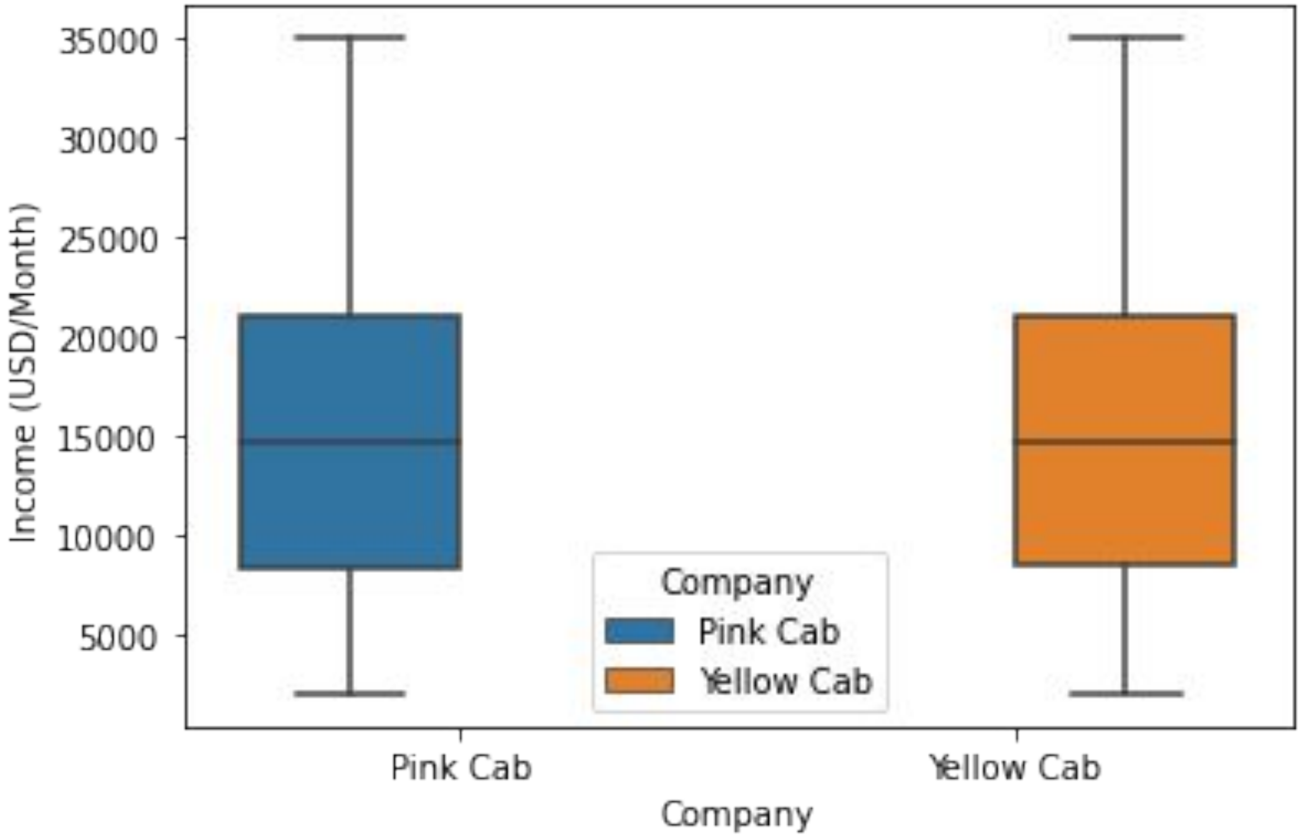
Distribution of income of users

Both companies users have a average income of around 15k



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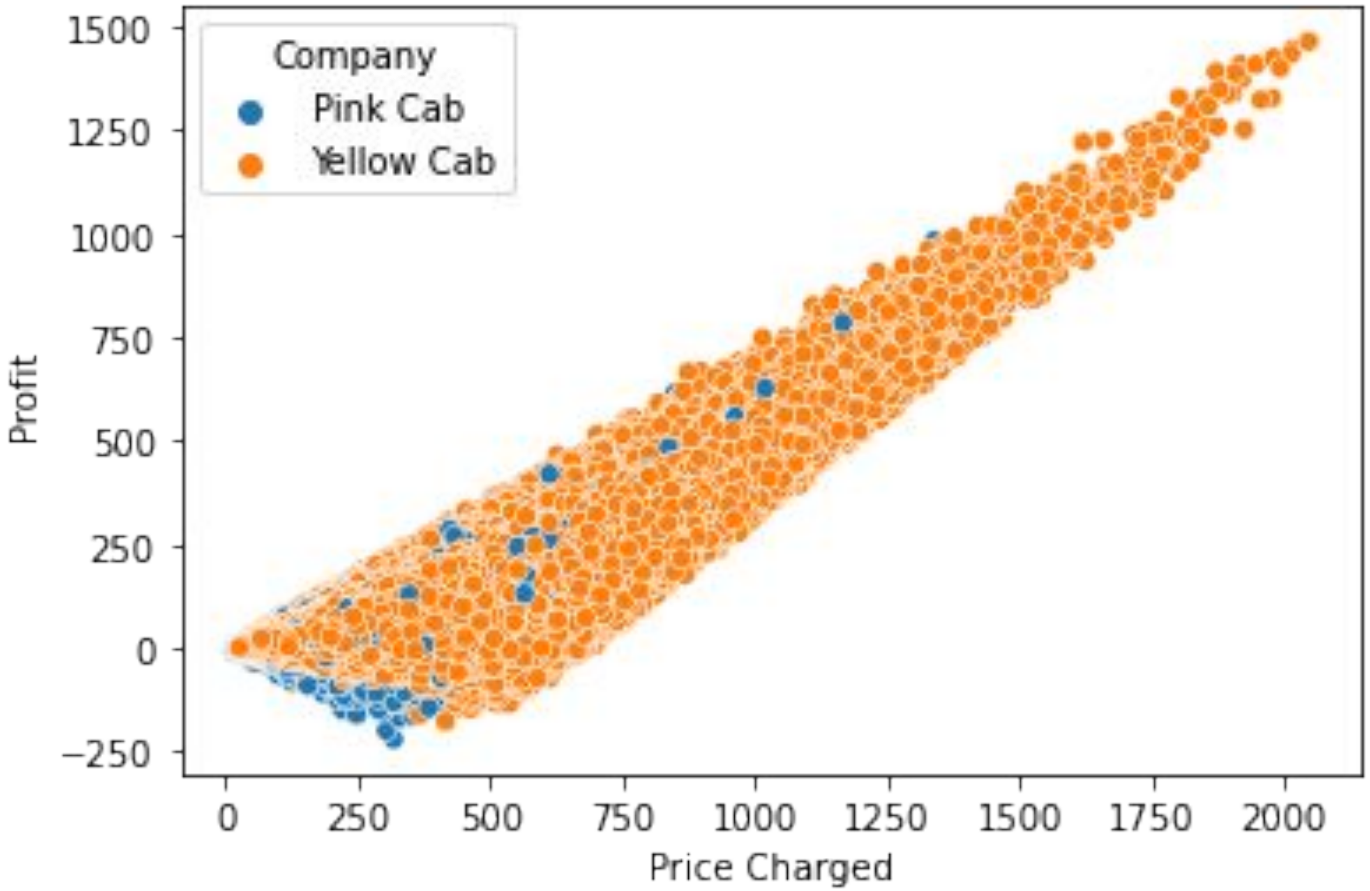
Is there a relation between price charged and profit

clearly we can see that there is a linear relation between price charged and profit earned



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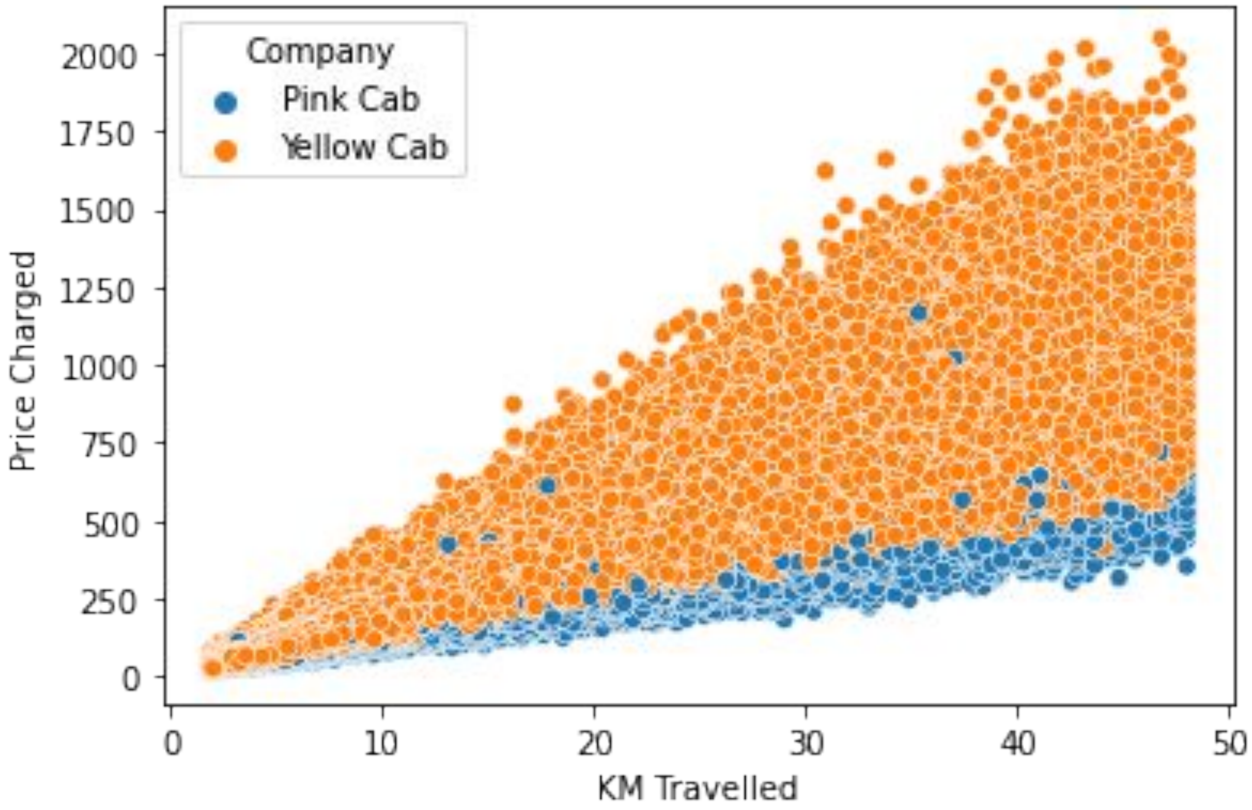
relationship between km travelled and price charged

There is a linear relationship between KM travelled and price charged



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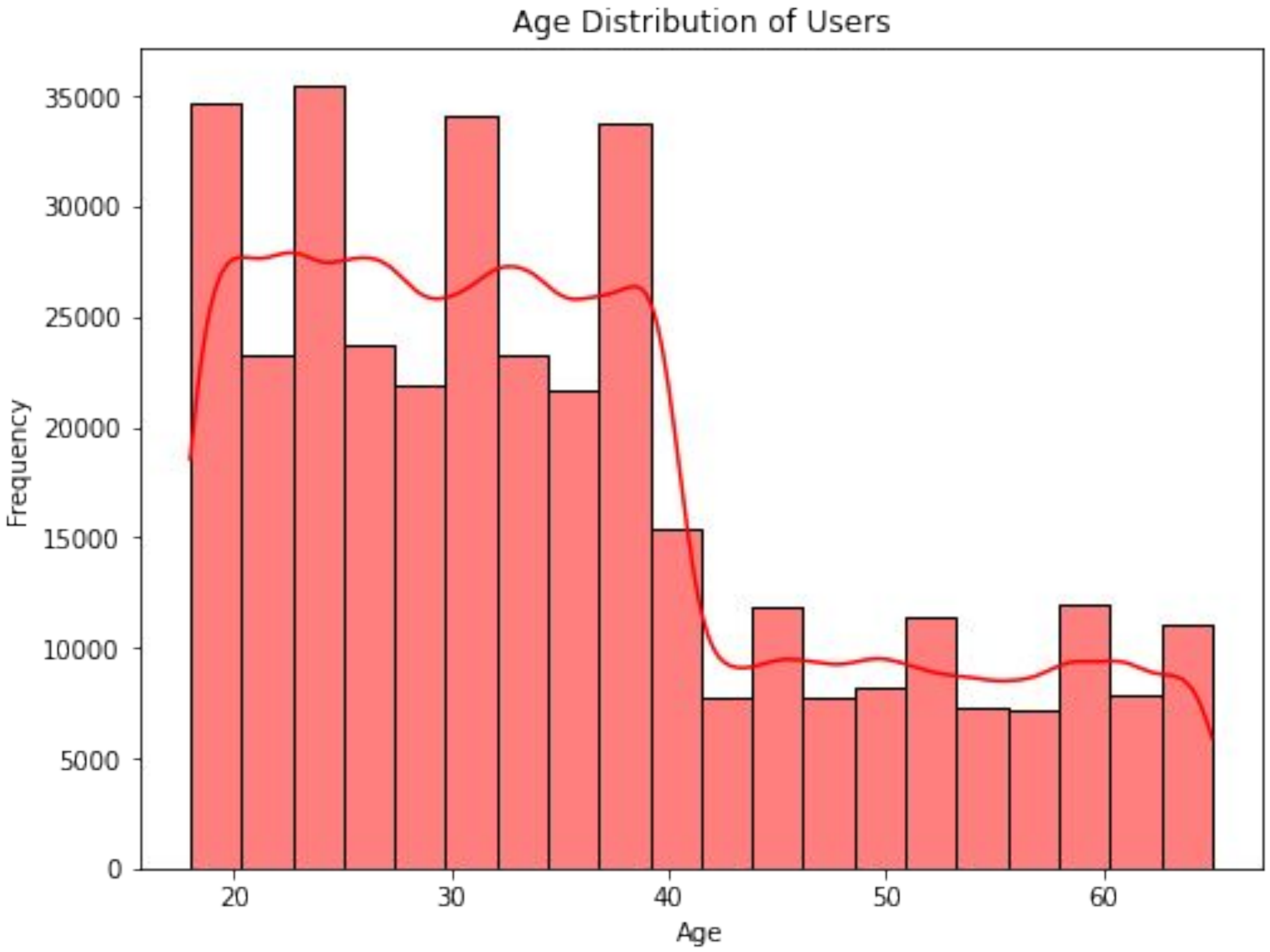
distribution of ages of users in dataset

Most users lie between age of 20 and 40



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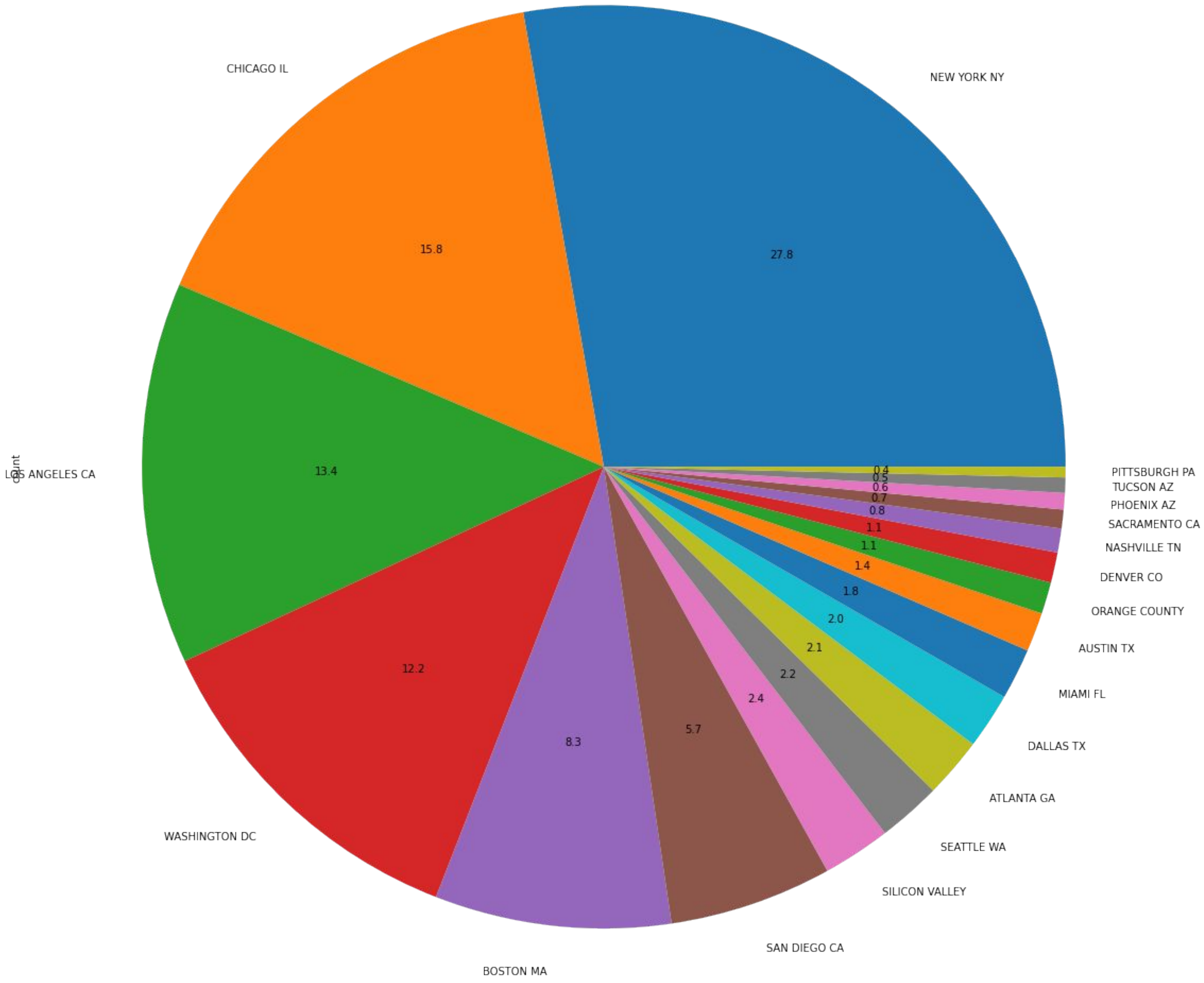
Users Per city

NY has more users than others



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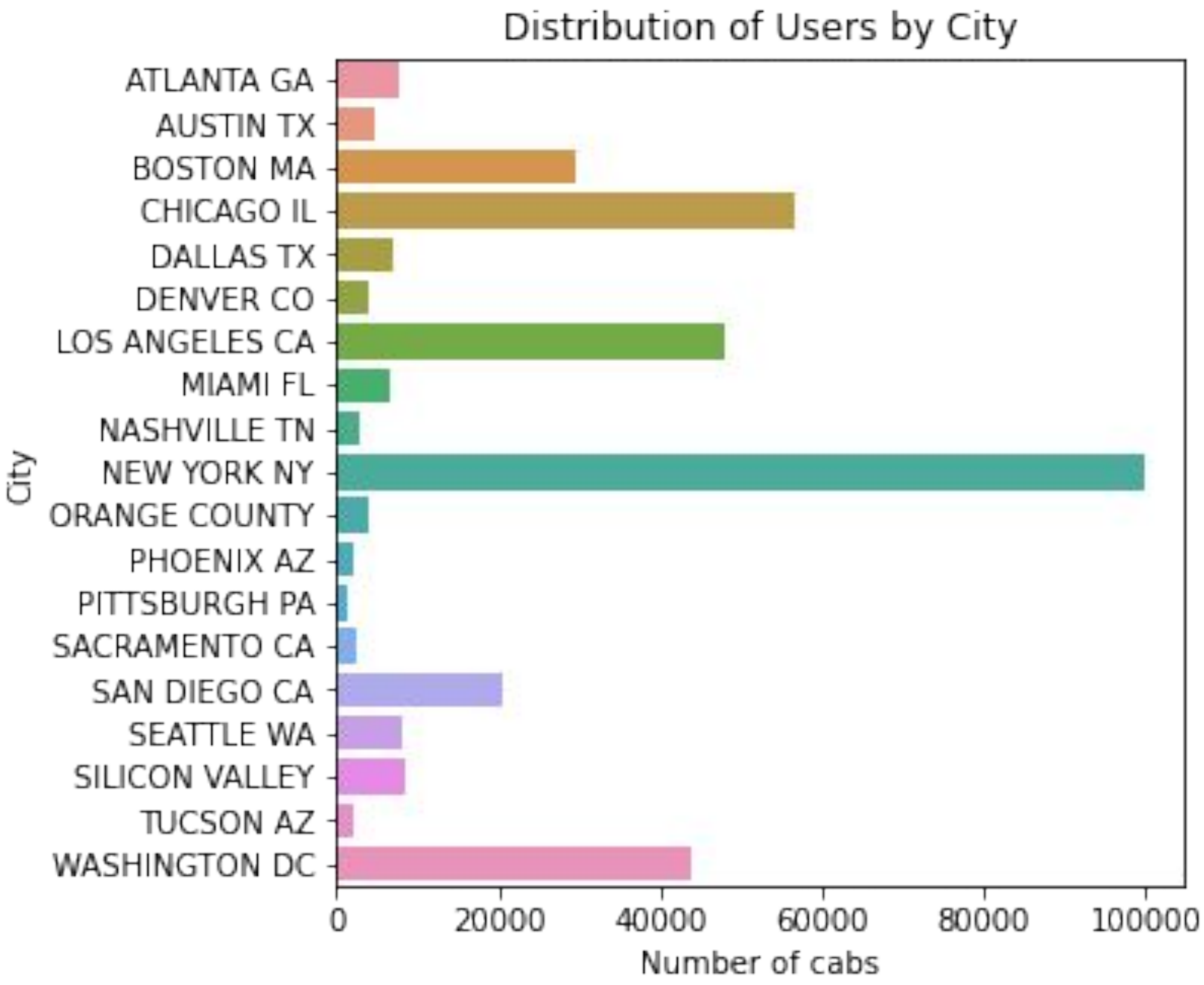
see cabs in cities

NY has highest number of cabs



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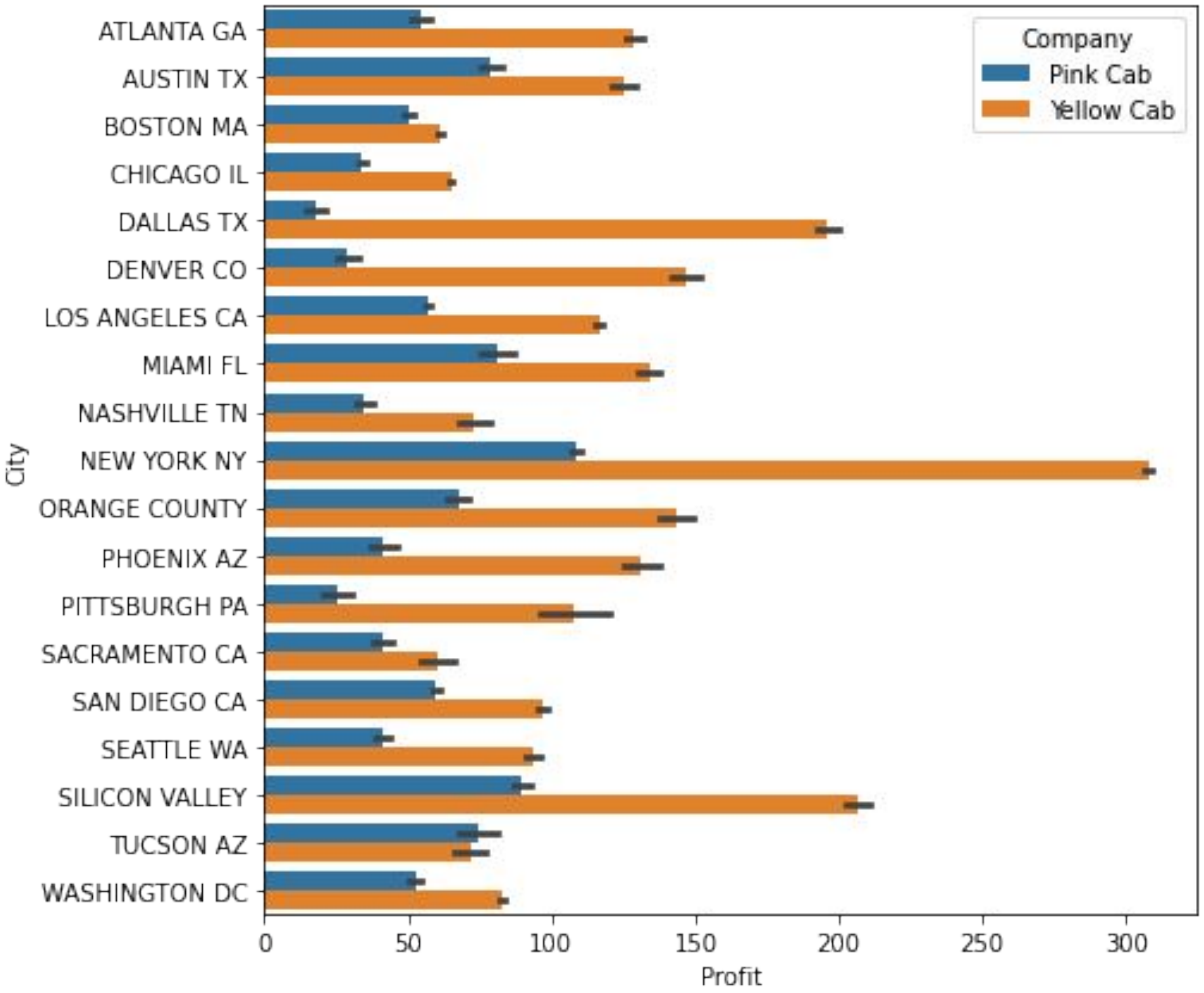
see profit of cabs in cities

NY has highest profit for both cabs



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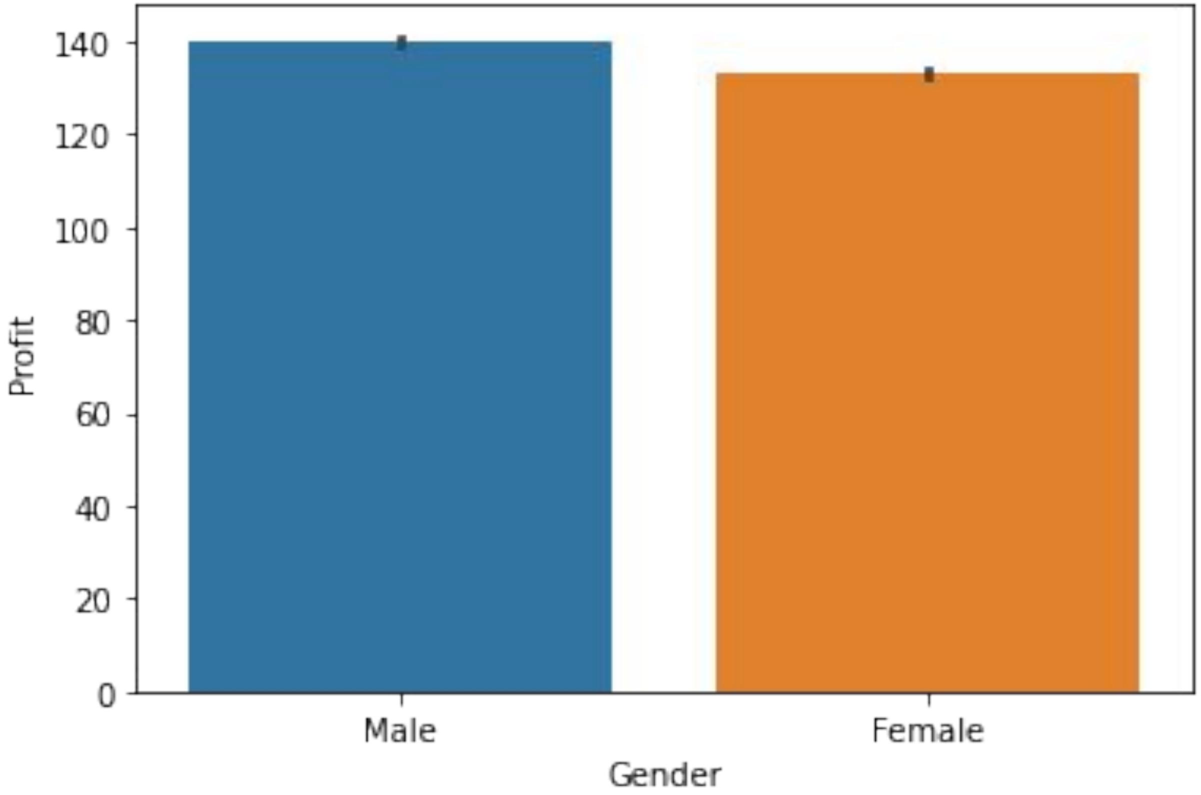
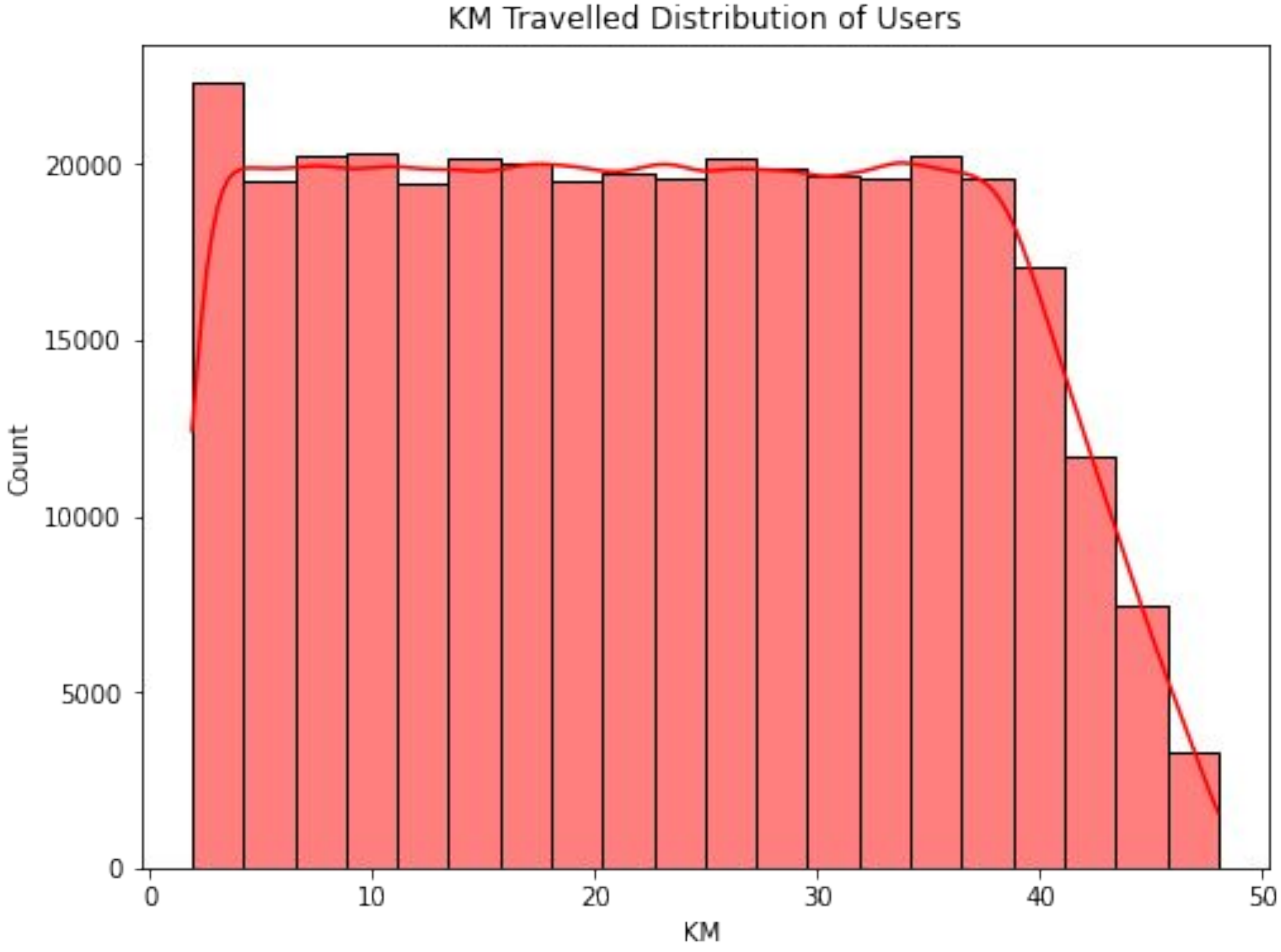
Does profit vary with gender

Male users result in higher profit



KM travelled distribution



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Hypothesis Testing

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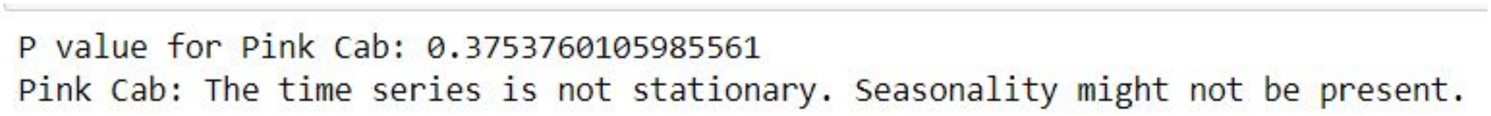
“Is there any seasonality in number of customers using the cab service?”

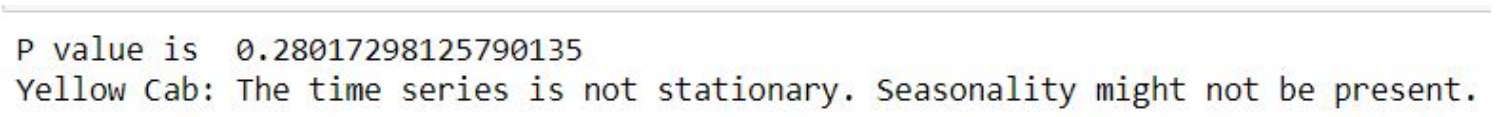
H0: There is seasonality
H1: There is no seasonality

For Pink cab:



```
P value for Pink Cab: 0.3753760105985561
Pink Cab: The time series is not stationary. Seasonality might not be present.
```

For yellow cab:



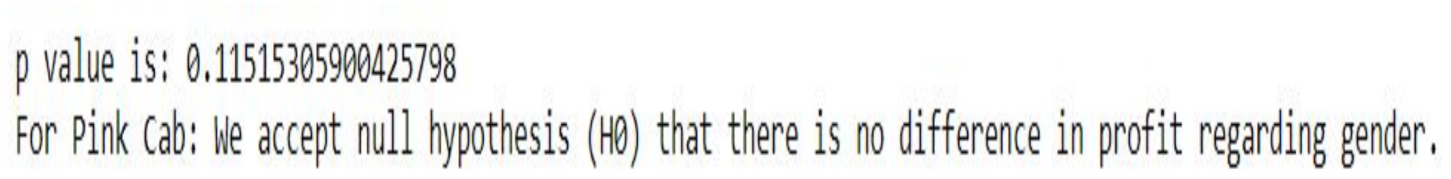
```
P value is  0.28017298125790135
Yellow Cab: The time series is not stationary. Seasonality might not be present.
```

Is there any difference regarding profit and gender

H0: there is no difference in profit regarding gender

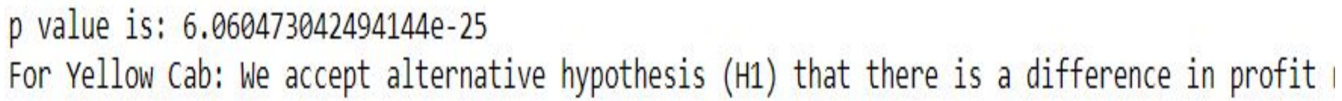
H1: there is a difference in profit regarding gender

For Pink cab:



```
p value is: 0.11515305900425798
For Pink Cab: We accept null hypothesis (H0) that there is no difference in profit regarding gender.
```

For yellow cab:



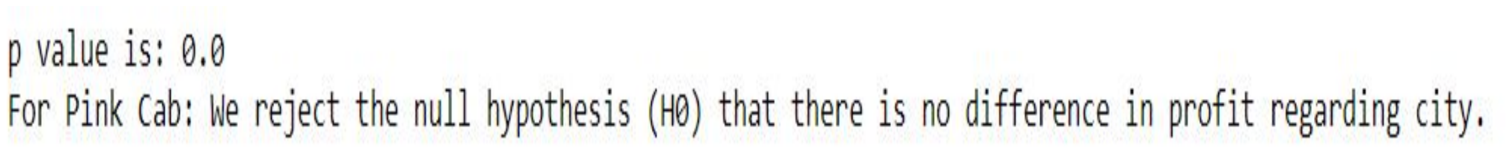
```
p value is: 6.060473042494144e-25
For Yellow Cab: We accept alternative hypothesis (H1) that there is a difference in profit
```

Is there any difference regarding city and profit

H0: there is no difference in profit regarding city

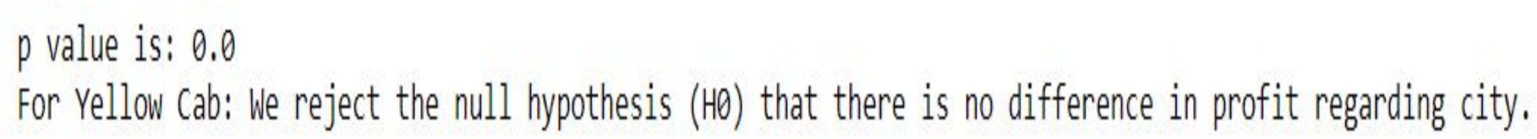
H1: there is difference in profit regarding city

For Pink cab:



```
p value is: 0.0
For Pink Cab: We reject the null hypothesis (H0) that there is no difference in profit regarding city.
```

For yellow cab:



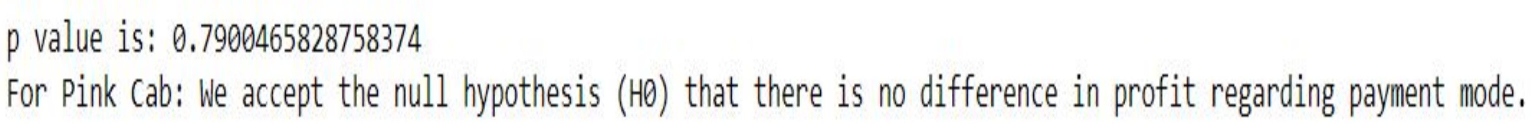
```
p value is: 0.0
For Yellow Cab: We reject the null hypothesis (H0) that there is no difference in profit regarding city.
```

Is there any difference in payment mode and profit

H0: there is no difference in profit regarding payment mode

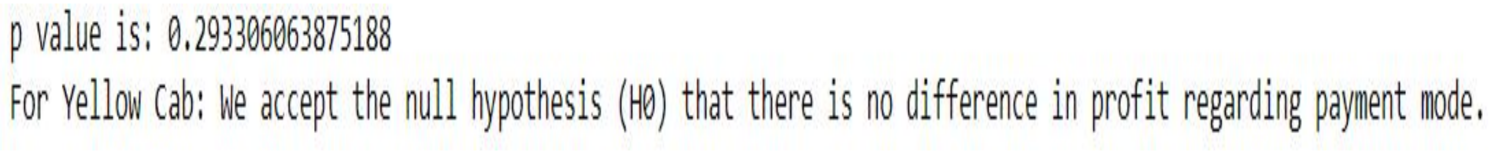
H1: there is difference in profit regarding payment mode

For Pink cab:



```
p value is: 0.7900465828758374
For Pink Cab: We accept the null hypothesis (H0) that there is no difference in profit regarding payment mode.
```

For yellow cab:



```
p value is: 0.293306063875188
For Yellow Cab: We accept the null hypothesis (H0) that there is no difference in profit regarding payment mode.
```

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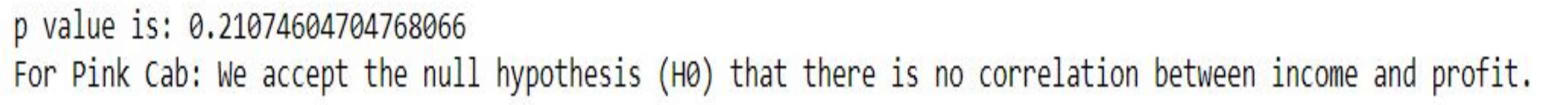
is there any difference in income and profit

H0: there is no correlation between income and profit.

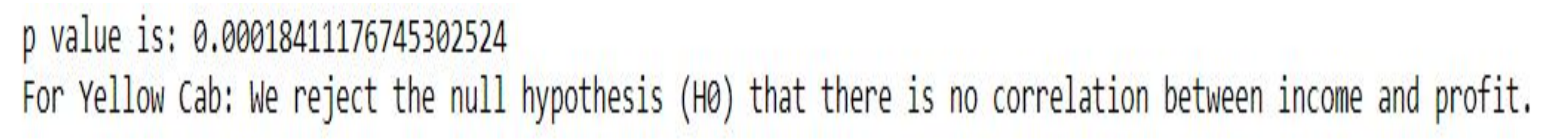
H1: there is correlation between income and profit

For Pink cab:



```
p value is: 0.21074604704768066
For Pink Cab: We accept the null hypothesis (H0) that there is no correlation between income and profit.
```

For yellow cab:



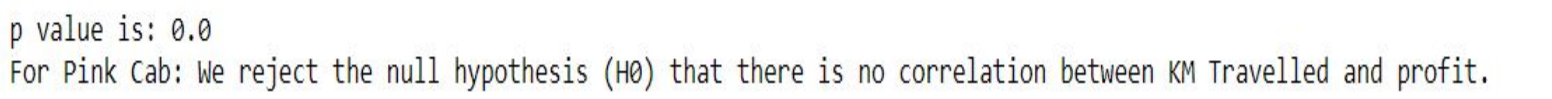
```
p value is: 0.00018411176745302524
For Yellow Cab: We reject the null hypothesis (H0) that there is no correlation between income and profit.
```

Is there any difference between KM Travelled and Profit

H0: there is no correlation between KM Travelled and profit

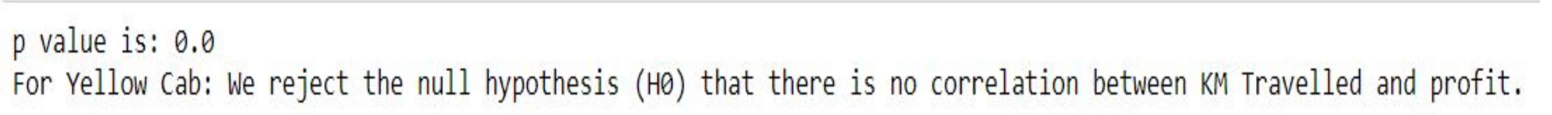
H1: there is correlation between KM Travelled and profit

For Pink cab:



```
p value is: 0.0
For Pink Cab: We reject the null hypothesis (H0) that there is no correlation between KM Travelled and profit.
```

For yellow cab:



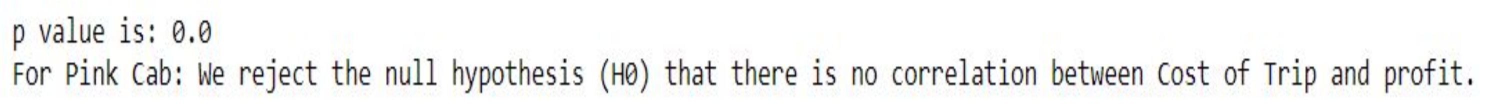
```
p value is: 0.0
For Yellow Cab: We reject the null hypothesis (H0) that there is no correlation between KM Travelled and profit.
```

Is there any difference between Cost of Trip and Profit

H0: there is no correlation between Cost of Trip and profit

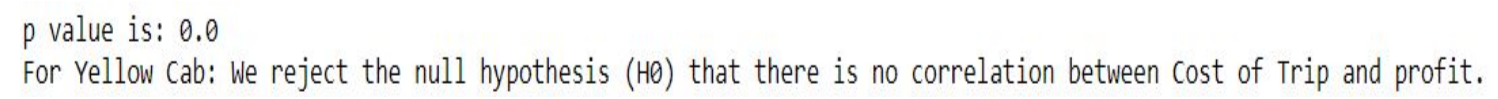
H1: there is correlation between Cost of Trip and profit

For Pink cab:



```
p value is: 0.0
For Pink Cab: We reject the null hypothesis (H0) that there is no correlation between Cost of Trip and profit.
```

For yellow cab:



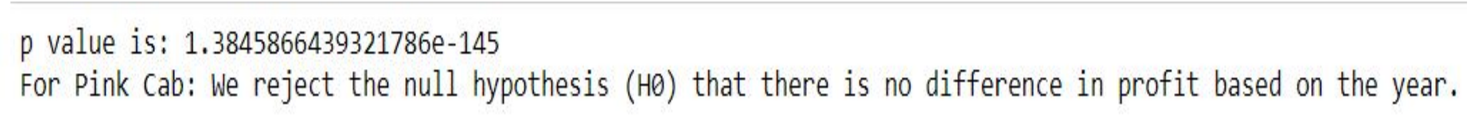
```
p value is: 0.0
For Yellow Cab: We reject the null hypothesis (H0) that there is no correlation between Cost of Trip and profit.
```

Is there any difference between Profit and Year

H0: there is no difference in profit based on the year

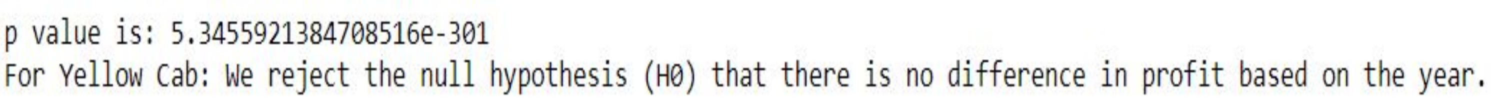
H1 : there is difference in profit based on the year.

For Pink cab:



```
p value is: 1.3845866439321786e-145
For Pink Cab: We reject the null hypothesis (H0) that there is no difference in profit based on the year.
```

For yellow cab:



```
p value is: 5.3455921384708516e-301
For Yellow Cab: We reject the null hypothesis (H0) that there is no difference in profit based on the year.
```

Findings

1. Yellow cab has more users
2. There are more yellow cabs than pink cabs
3. There are more male users than female users for both the companies
4. Yellow cab has more profit than pink cabs
5. Profit for both companies is decreasing year by year
6. 2017 has highest travel
7. December month has the highest travel
8. Both companies users have a average income of around 15k
9. Most users lie between age of 20 and 40
10. NY has more users than others
11. NY has highest profit for both cabs

Thank
You!!!
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