Data Glacier

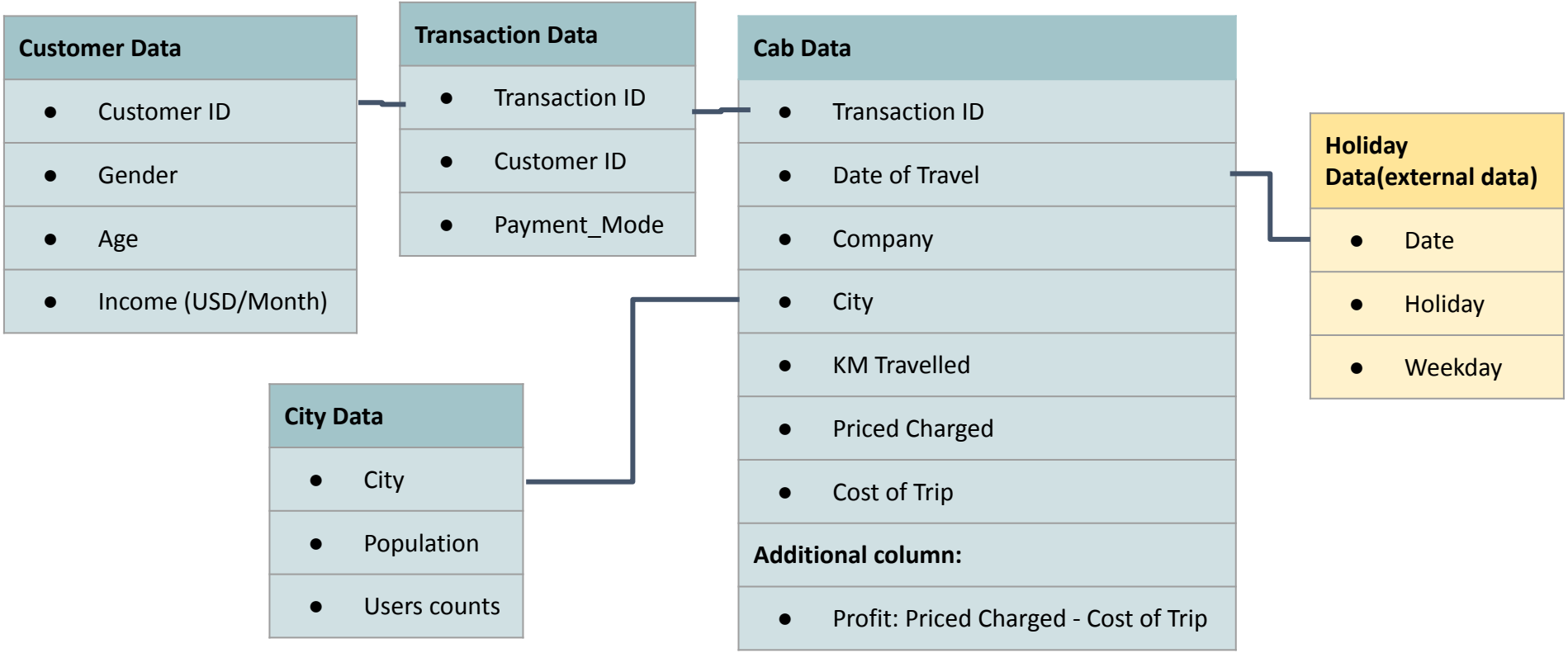
Your Deep Learning Partner

Cab Company Analysis

7/20/2023

Terry Chou

Data

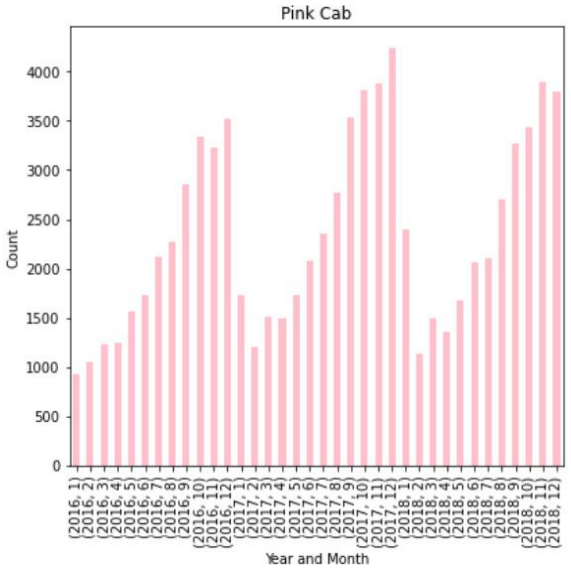

Customer Data
Customer ID
Gender
Age
Income (USD/Month)
Transaction Data
Transaction ID
Customer ID
Payment_Mode
Cab Data
Transaction ID
Date of Travel
Company
City
KM Travelled
Priced Charged
Cost of Trip
Additional column:
Profit: Priced Charged - Cost of Trip
Holiday Data(external data)
Date
Holiday
Weekday
City Data
City
Population
Users counts

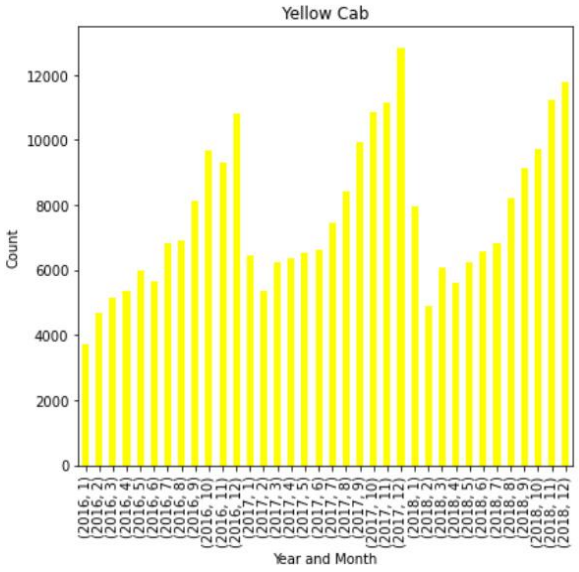
Hypothesis

- Do the demand for cab service has seasonality, and do different companies experience different pattern
- Which company is more profitable, what are factors that influence the profit
- What are the structure for customer age, income, gender, and payment method for each company
- Which company has better customer loyalty
- How do the cab companies perform in different locations/cities
- Do holidays have an impact on the demand for cab service

Seasonality

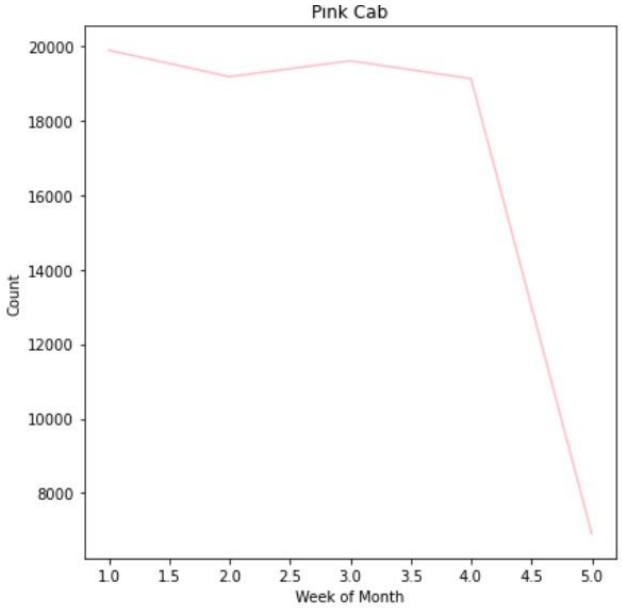
Seasonality (Year & month demand)

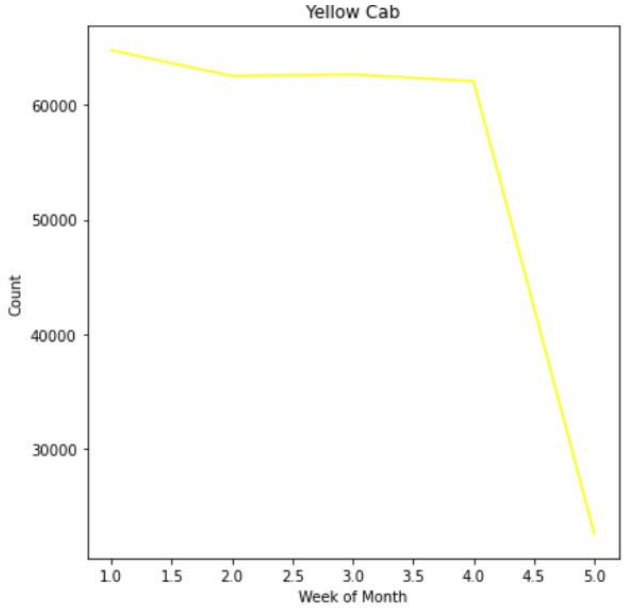




- Highly similar year-month seasonality pattern for demand.
- Low at the beginning of the year.
- Gradually increases until the end of the year.

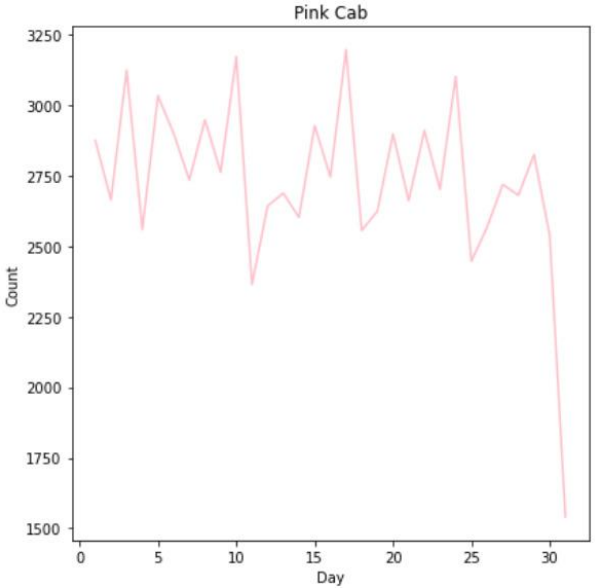
Seasonality (by week)

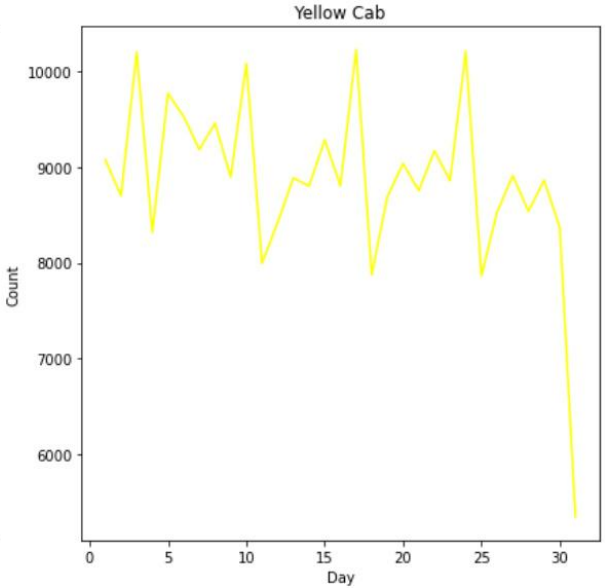




- Have similar pattern for weekly demand.
- Consistently high demand until the final week of the month

Seasonality (by day of the month)





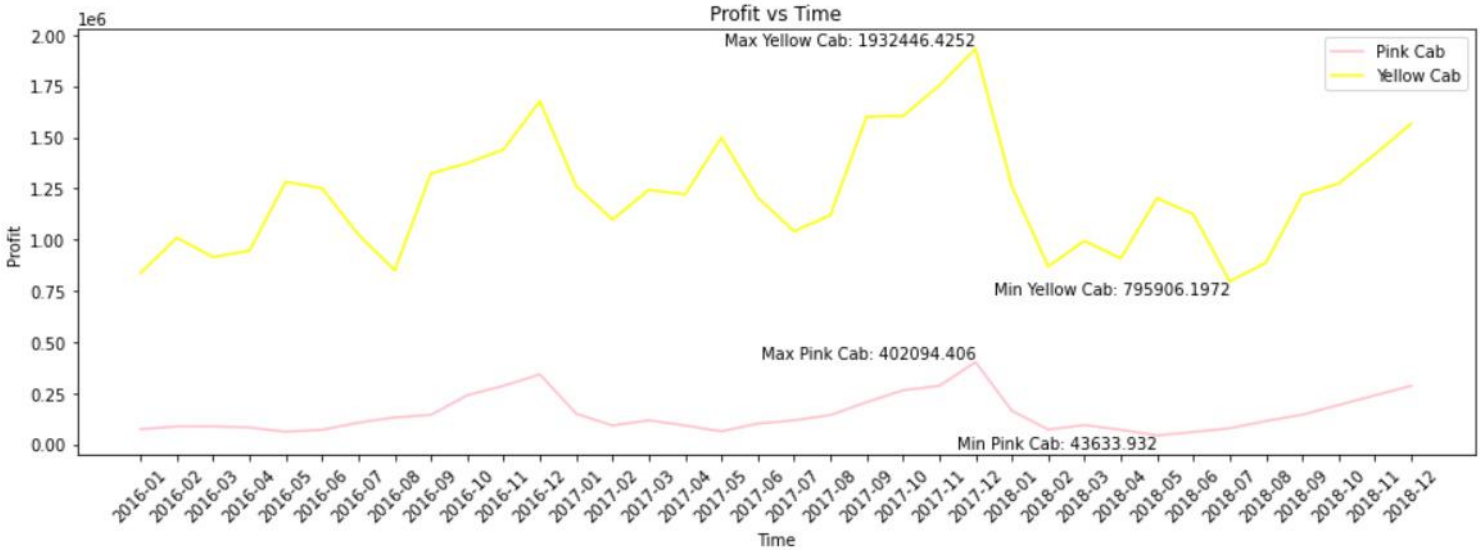
- Have similar pattern of daily demand.
- Experience highly similar peak and trough pattern

Insights

- Both company have the same pattern of seasonality for demand.
- The demand starts low at the beginning of the year and gradually increases until the end of the year.
- The demand for cab decline rapidly at the end of the month

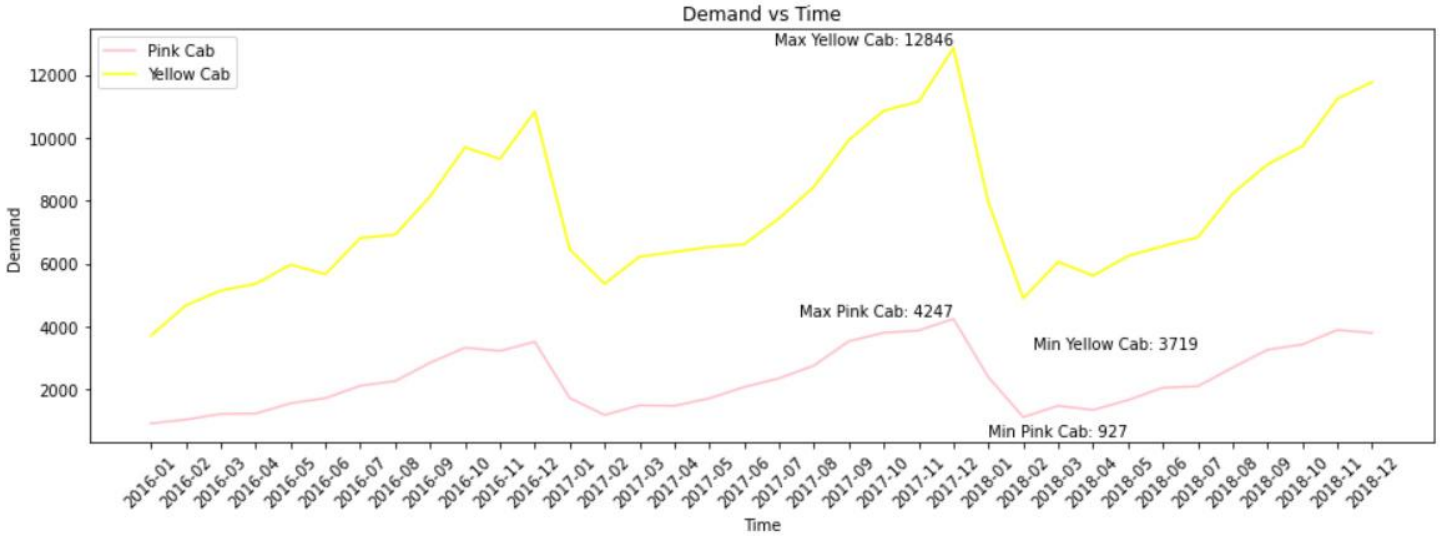
Profitability

Profit Comparison



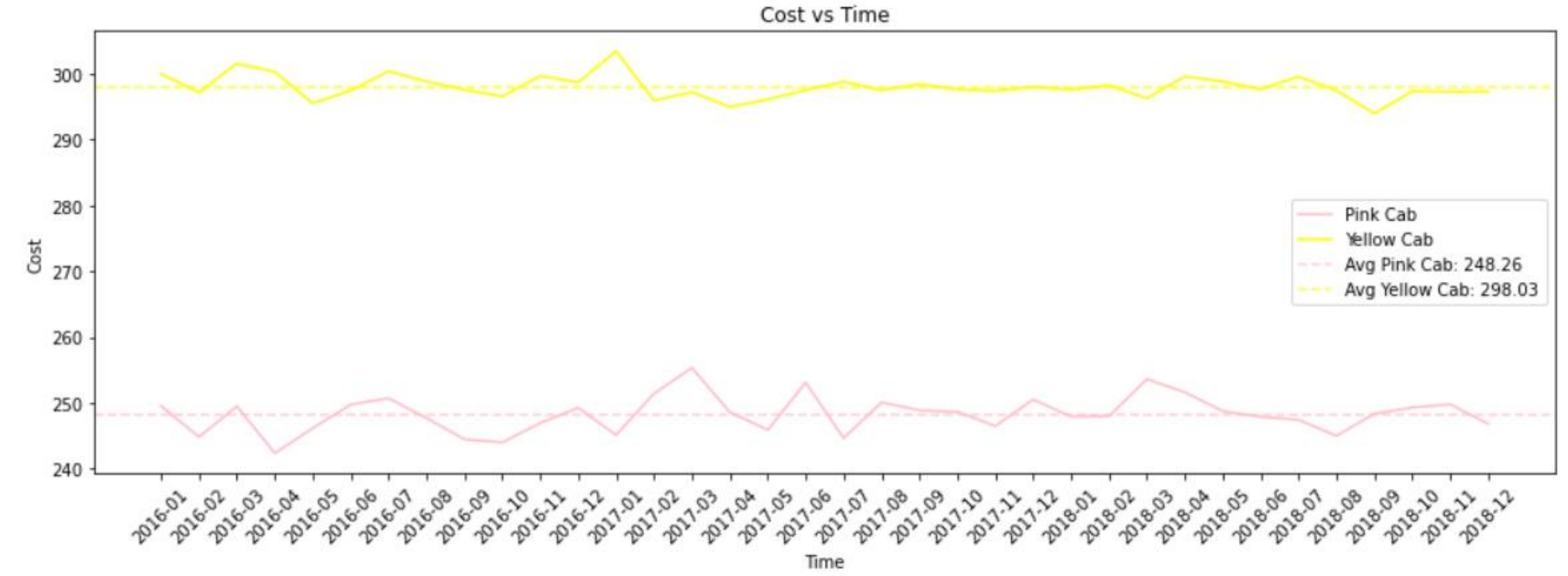
	Yellow Cab	Pink Cab
Max monthly profit	$ 1932446.43	$ 402094.41
Min monthly profit	$ 795906.20	$ 43633.93

Demand Comparison



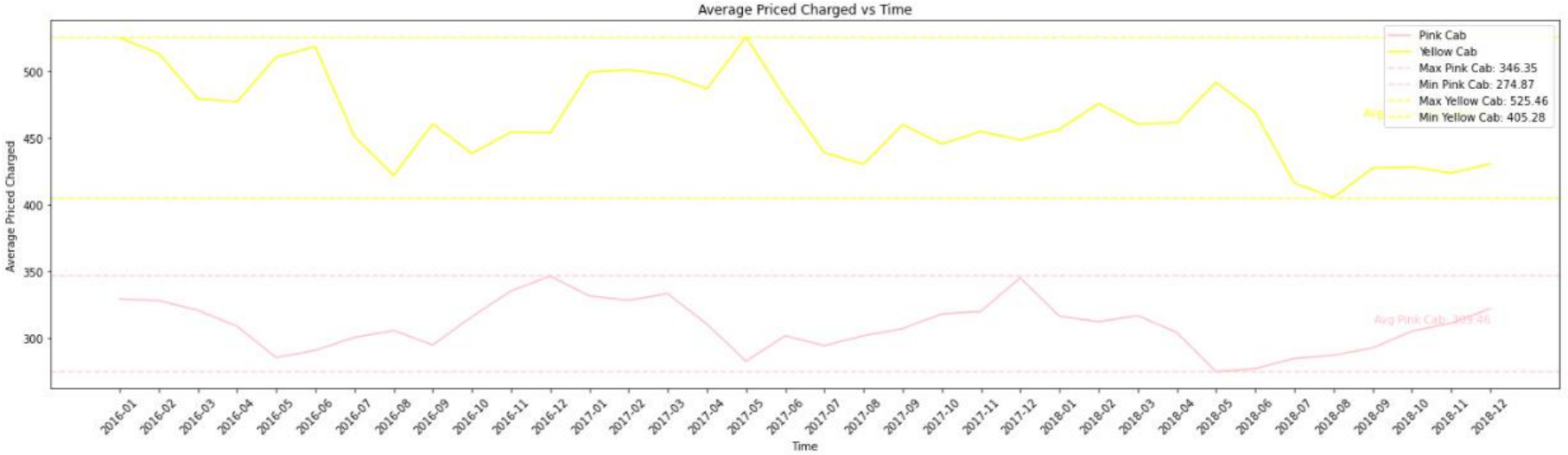
	Yellow Cab	Pink Cab
Max. user counts	12846	4247
Min. user counts	3719	927

Cost Comparison



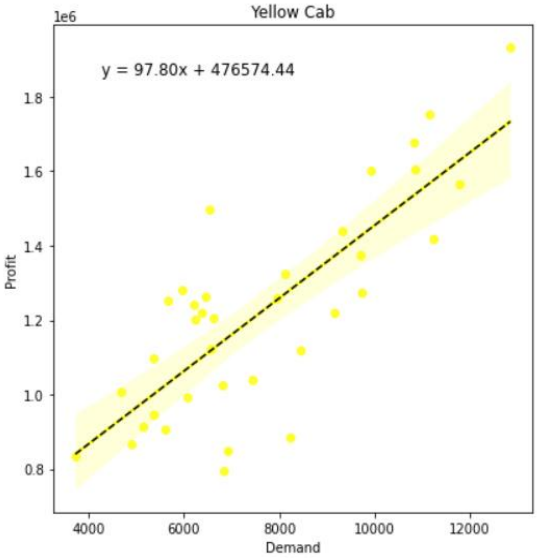
- The cost per trip for both company stays fairly consistent throughout the period.
- Yellow cab average cost: 298.03
- Pink cab average cost: 248.26

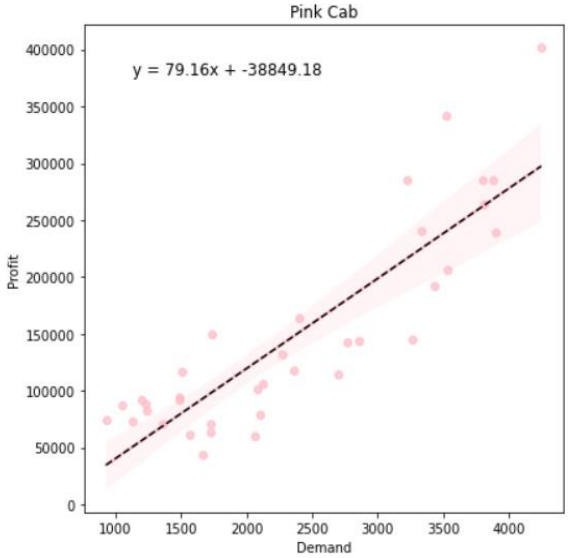
Price Comparison



	Yellow Cab	Pink Cab
Max price	$ 525.46	$ 346.35
Min price	$ 405.28	$ 274.87

Correlation between profit and demand



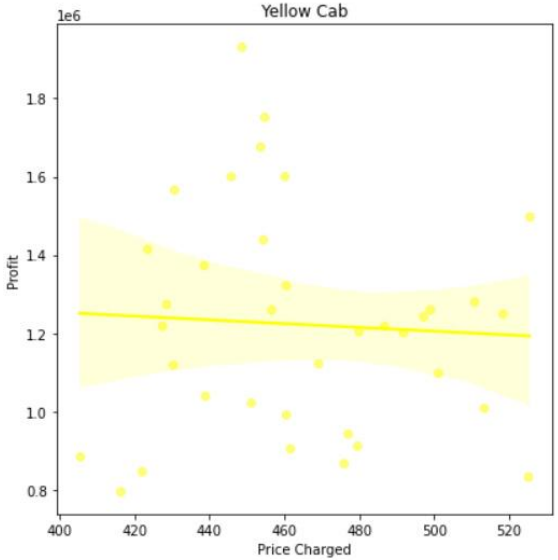


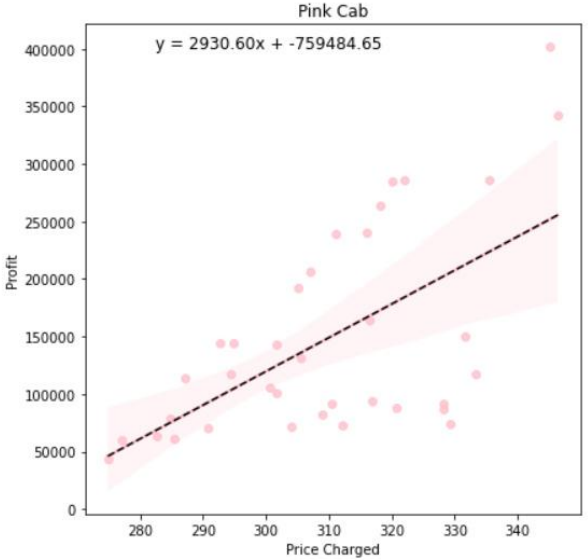
- Yellow Cab:
  - Positive correlation
  - profit = demand * 97.80 + 476574

- Pink Cab:
  - Positive correlation
  - profit = demand * 79.16 -38849

- The change in demand has slightly greater impact on the profit of yellow cab since the yellow cab has a larger slope.

Correlation between profit and price

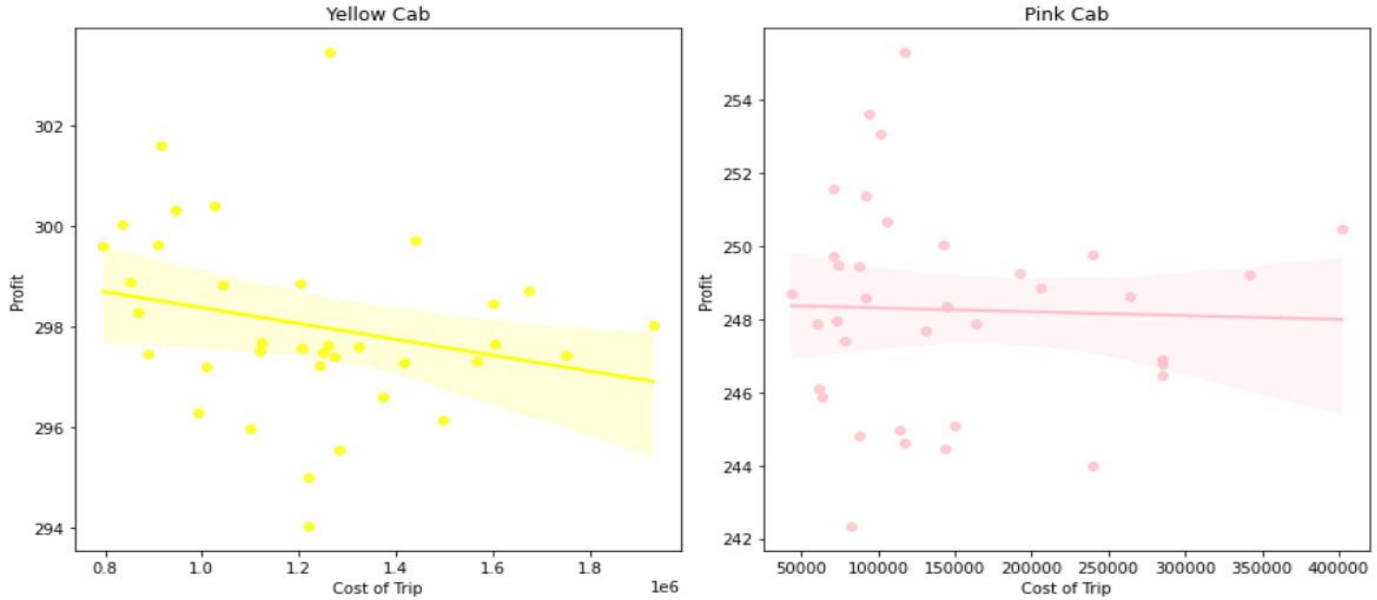




- Yellow Cab:
  - No clear correlation

- PInk Cab:
  - Positive correlation
  - price *2930.6 -759484.65

Correlation between profit and cost



- Weak correlation between profit and cost.

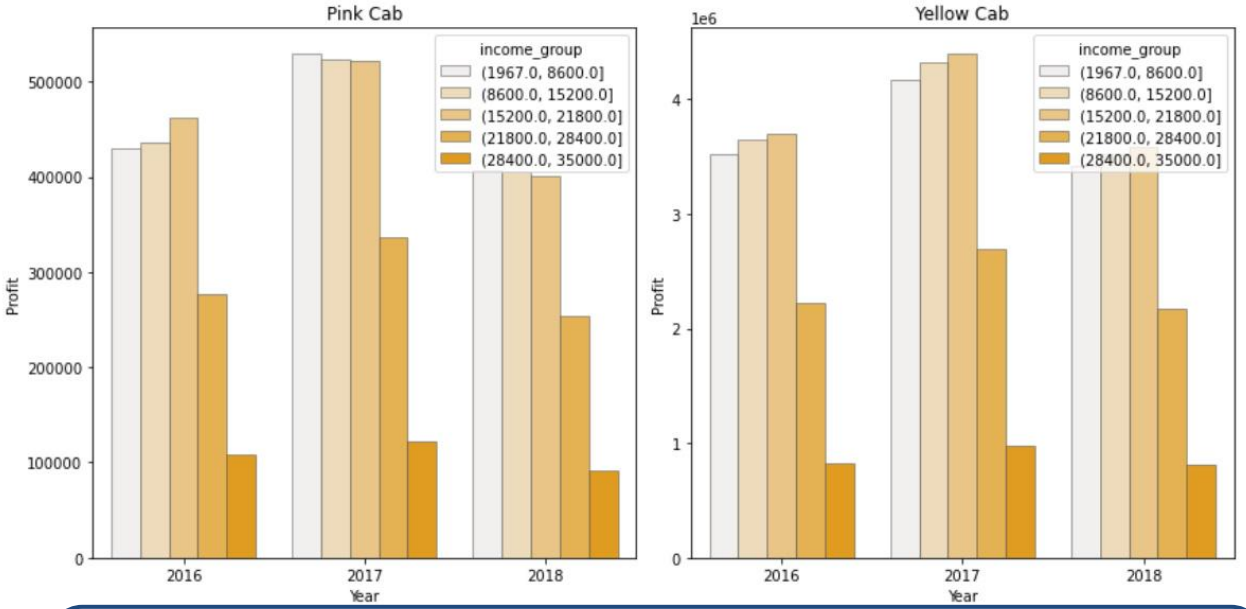
Insights

- **Yellow Cab is significantly more profitable than Pink Cab.**
- Demand has a strong correlation with profit.
- Cost doesn't show correlation with profit
- Price and profit:
    - Positive correlation for Pink Cab; No clear correlation for yellow cab

	Yellow Cab	**Pink Cab**
Profit	High	Low
Demand	High	Low
Price	High	Low
Cost	High	Low

Customer Structure and Attribute

Profit by different Income group

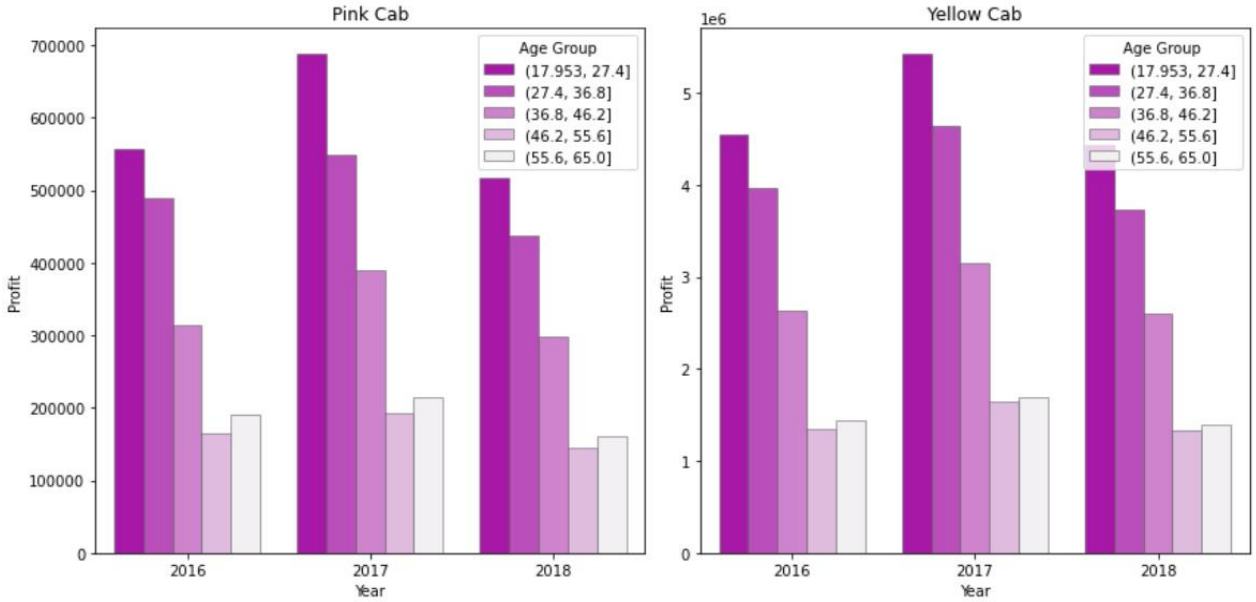


Similar income group proportion each year for both companies

Profit	Income group
Highest	1.9k ~ 8.6k 86.k ~ 15k 15k ~ 21k
Medien	21k~28k
Lowest	28k~35k

Profit	Income group
Highest	1.9k ~ 8.6k 86.k ~ 15k 15k ~ 21k
Medien	21k~28k
Lowest	28k~35k

Profit by different age group



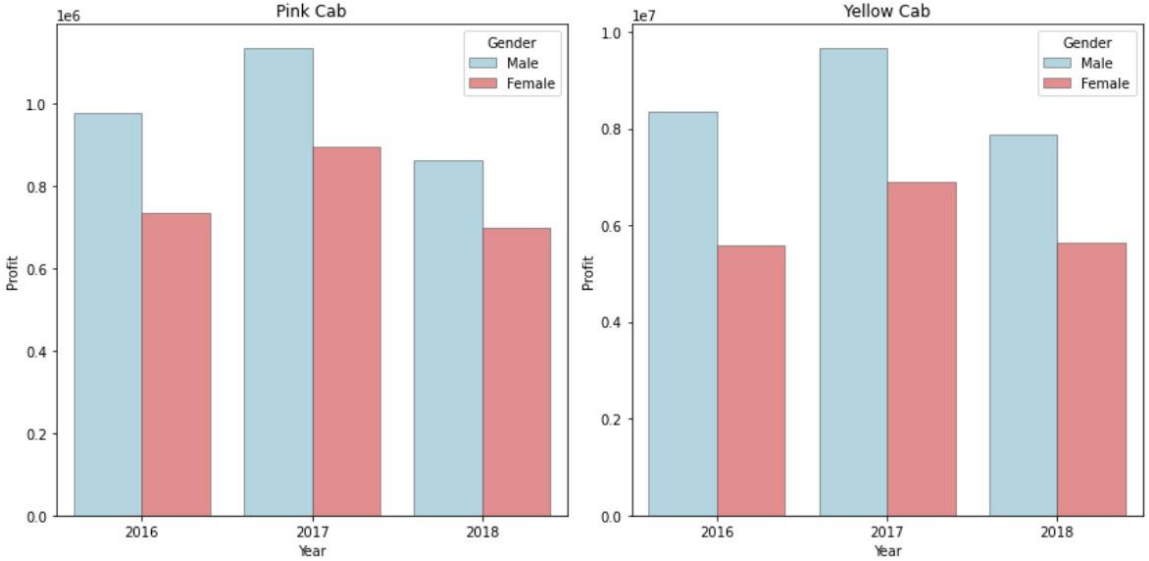
- Pink Cab:
  - 18~27 > 27~ 36 > 36~46 > 56~ 65> 46~56

- Yellow Cab:
  - 18~27 > 27~ 36 > 36~46 > 56~ 65> 46~56

Similar age group proportion each year for both companies

Profit by different gender

-
-

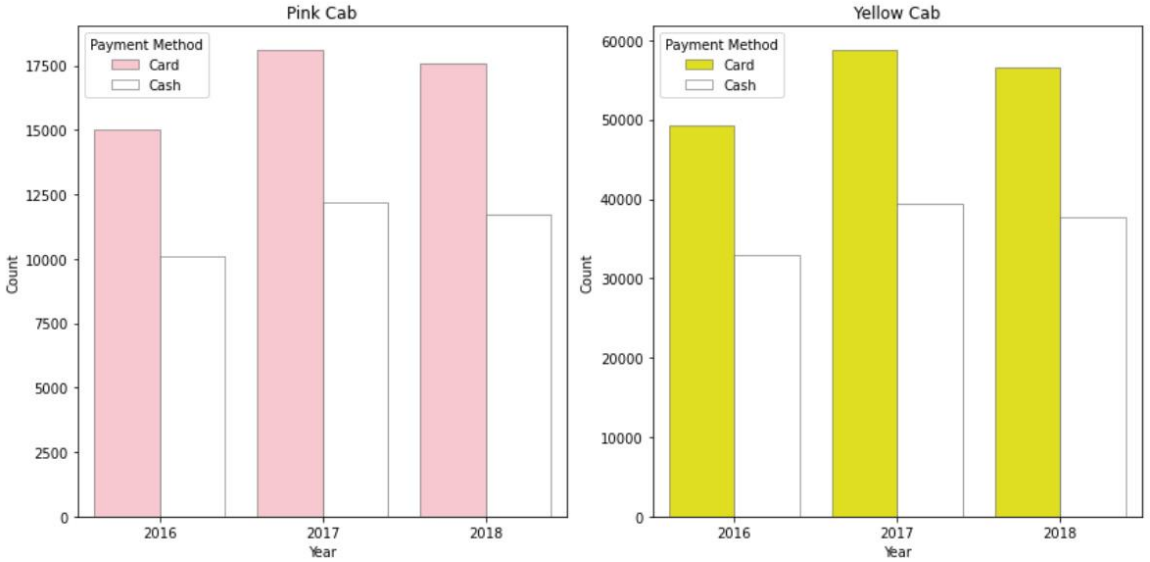


- Pink Cab:
  - Male > female

- Yellow Cab:
  - Male > female

Similar gender proportion each year for both companies

Payment method counts



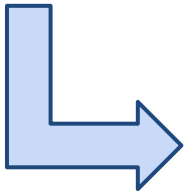
- Pink Cab:
  - Card > cash

- Yellow Cab:
  - Card > cash

Similar payment method proportion each year for both companies

Insights

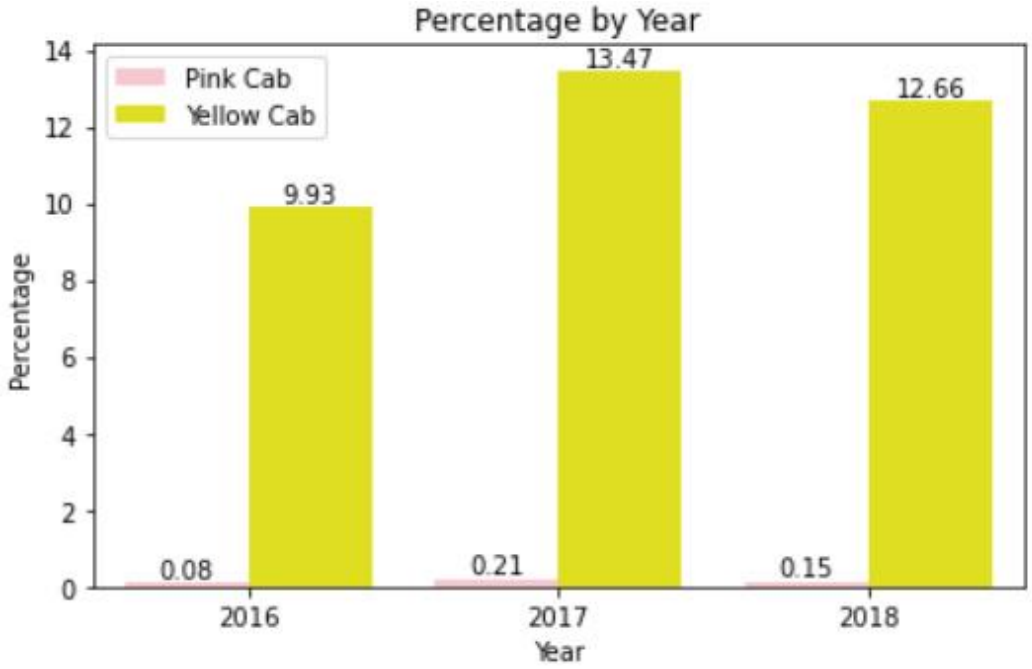
- Both companies have similar profit proportion for income, age, gender
- Both companies have similar payment method proportion (card vs cash)



- No recommendation could be made in terms of which company is better to invest in for this section of analysis.

Customer Loyalty

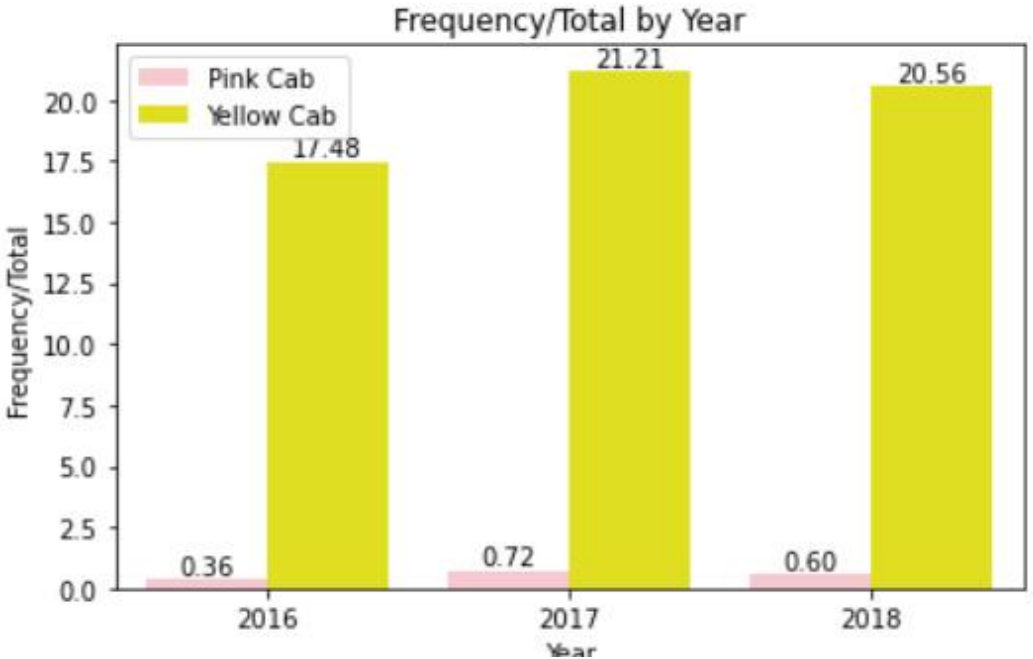
Customer who uses cab service in 6 different month



- Yellow Cab:
  - around **10%** of customers use their service in 6 different month every year.

- Pink Cab:
  - around **0.1% ~ 0.2%** of customers use their service in 6 different month every year.

Customer who uses cab service more than 5 times



- Yellow Cab:
  - **above 15%** of customers use their service more than 5 times each year.

- Pink Cab:
  - **less than 1%** of customers use their service more than 5 times each year.

Insights

- On top of having a larger user base, **yellow cab also has higher percentage of loyal users** that return to use their service.

- **Pink cab do not have significant proportion of loyal users**. They have less than 1% of users that consistently return to use their service.

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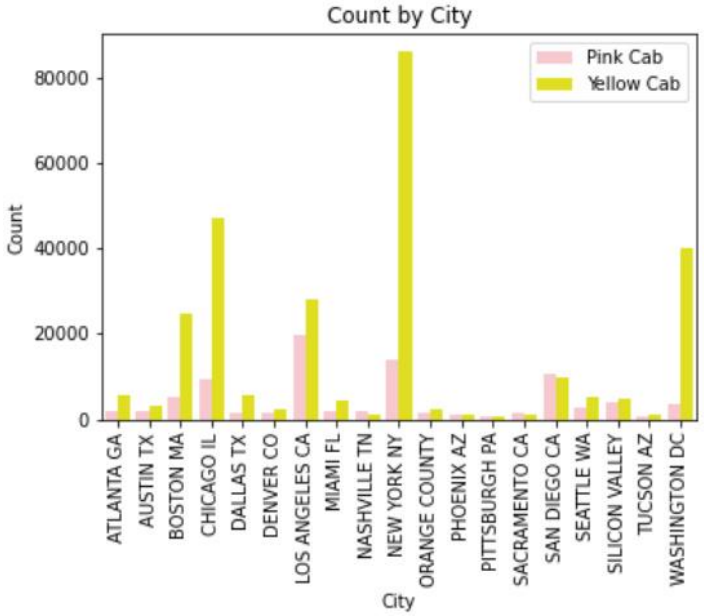
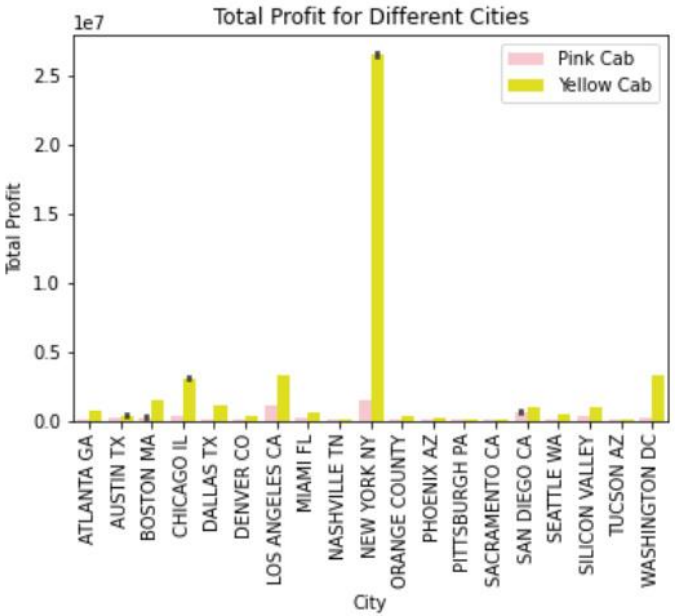
Performance in difference Location

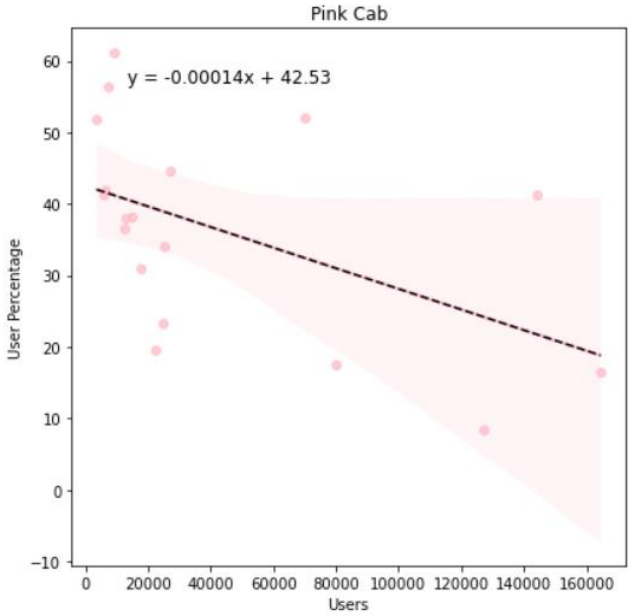
User counts & profit in different cities

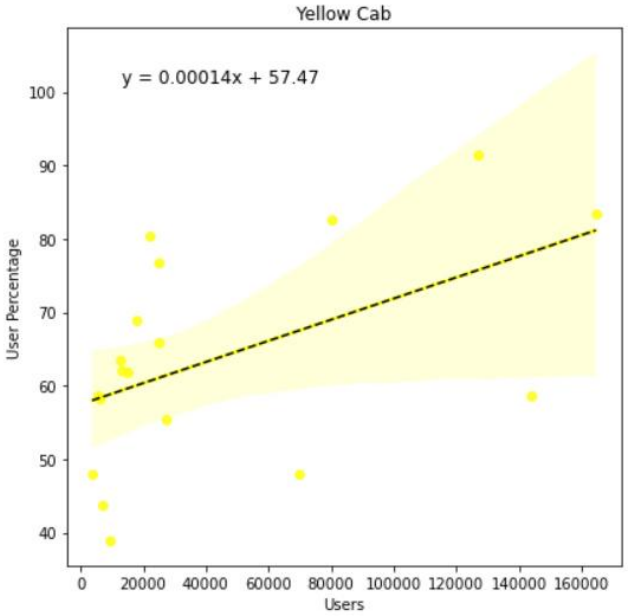




Yellow cab has more users in most cities, and is more profitable by huge margin.

User proportions vs User counts





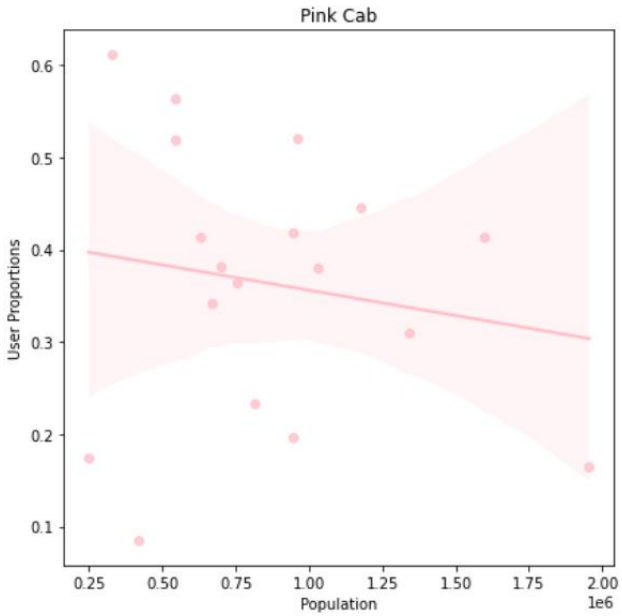
- Pink Cab:
  - User percentage = -0.00014* total users +42.53

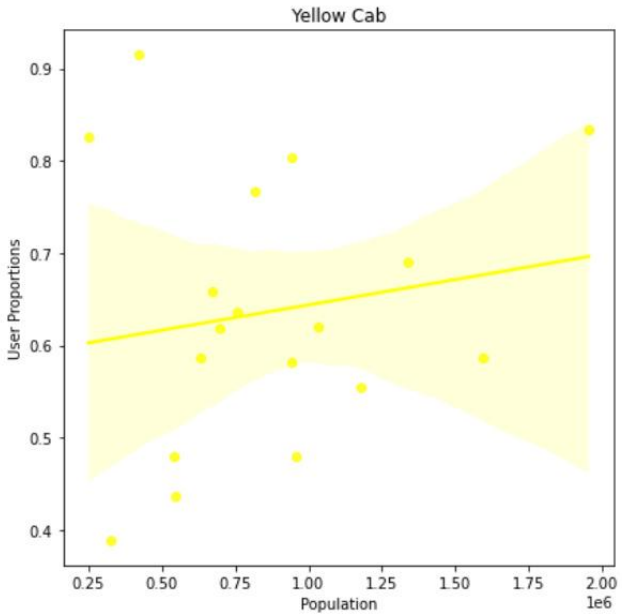
- Yellow Cab:
  - User percentage = 0.00014* total users +57.47

According to the trend line, **as the total user counts get larger**:

- Yellow Cab takes up a **larger** proportion of users
- Pink Cab takes up a **smaller** proportion of users

User Proportions vs Population Size





- Pink Cab:
  - Plots are scattered
  - No clear correlation

- Yellow Cab:
  - Plots are scattered
  - No clear correlation

- No clear relationship between user proportion & population size can be derived for both companies.

Insights

Possible correlation:

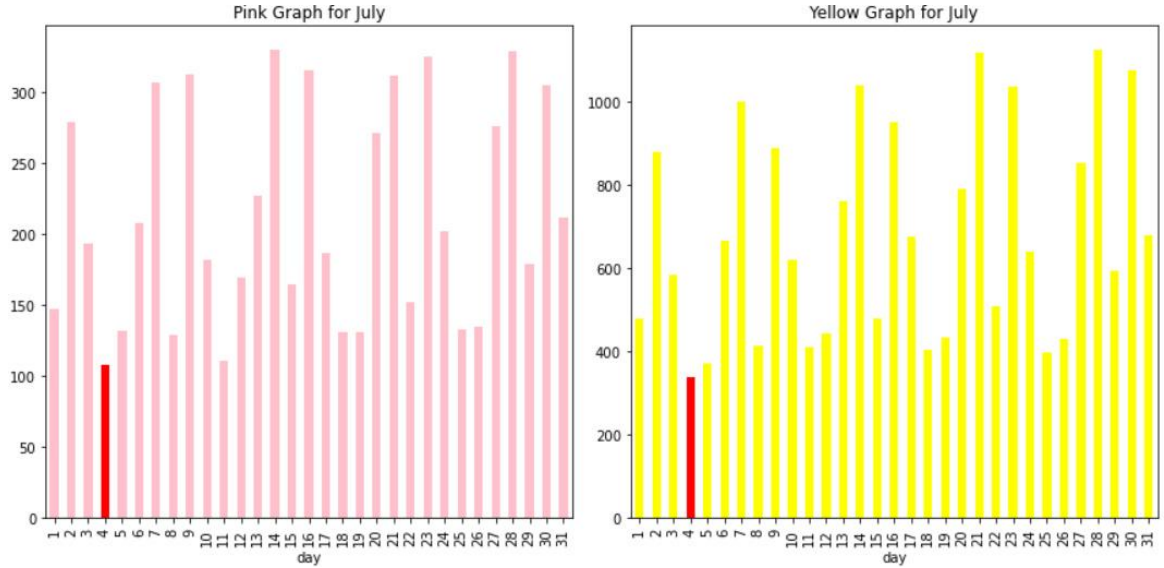
- As **user amount increases** → Yellow Cab takes up a **larger** proportion of users
- As **user amount increases** → Pink Cab takes up a **smaller** proportion of users

On the other hand:

- User proportion and total population don’t express clear relationship

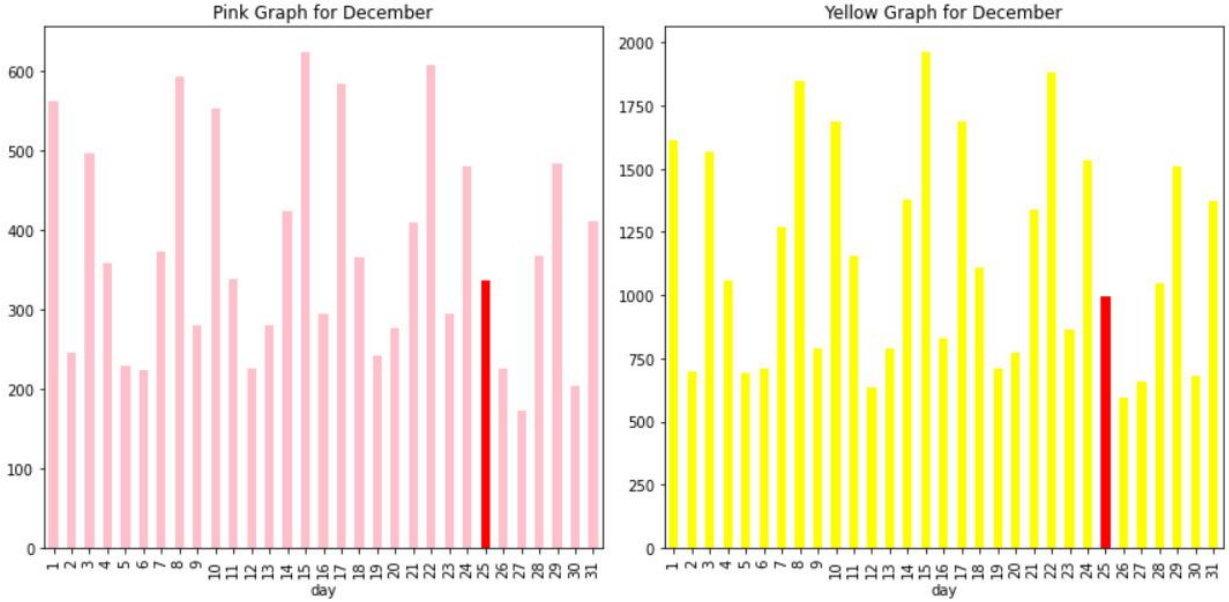
Holiday

Holiday Demand (July 4th)



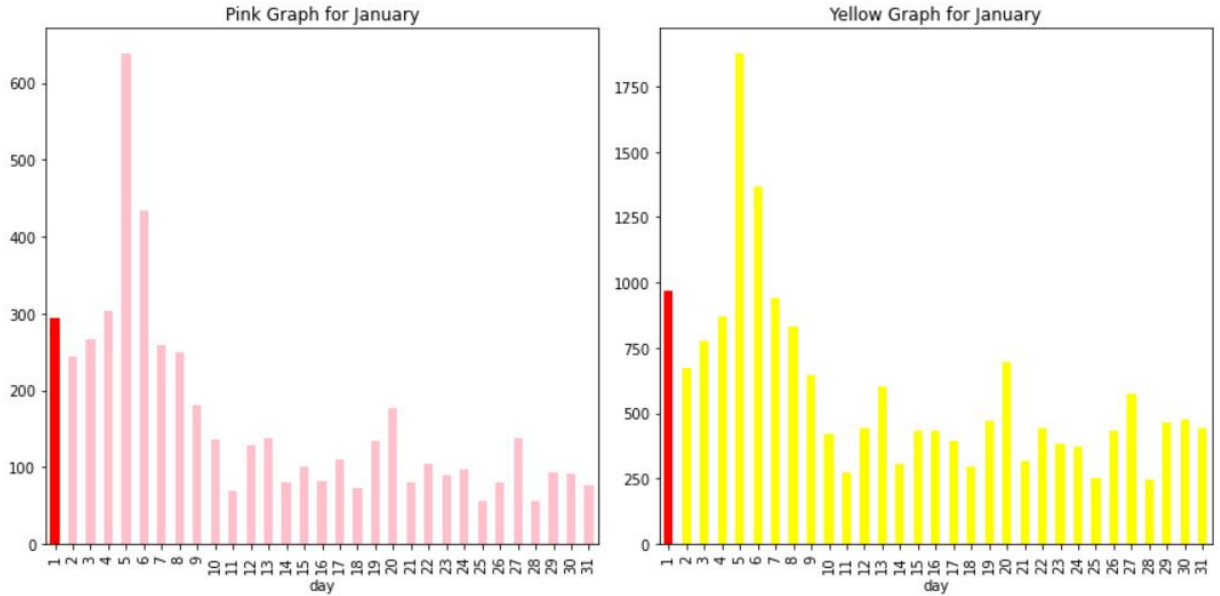
- Demand of July 4th is low
- The seasonality of demand does not express anything unique around July 4th
- Thee impact of this holiday on demand of cab service is **very small**

Holiday Demand (Christmas)



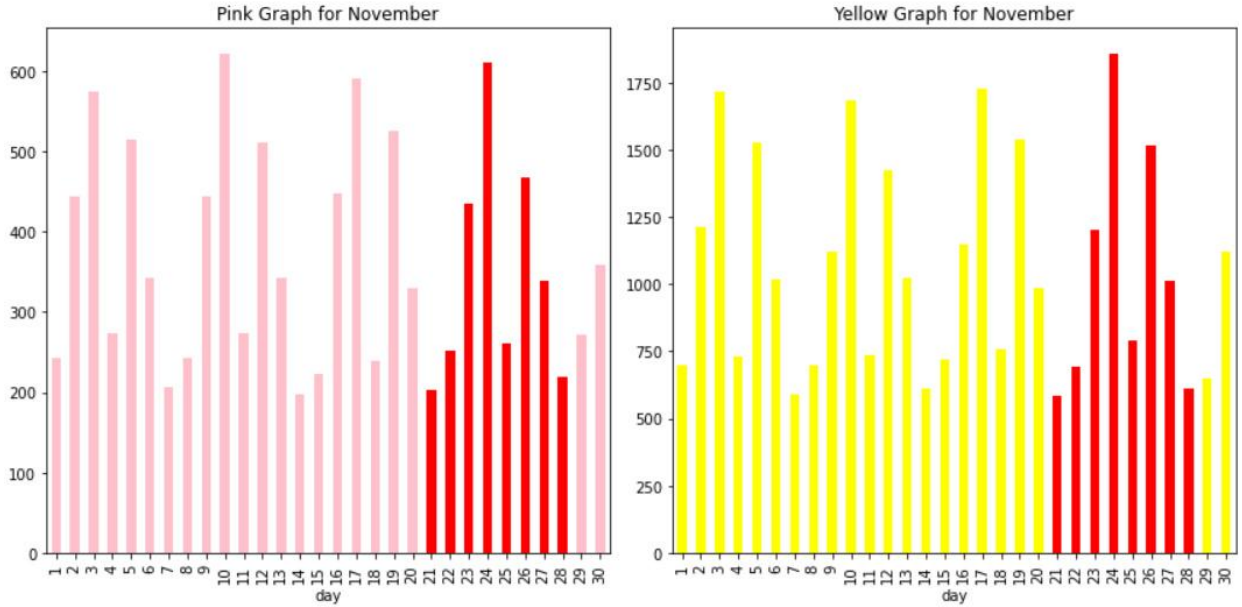
- Demand on Christmas is quite low
- The seasonality of demand does not express anything unique around Christmas
- Thee impact of this holiday on demand of cab service is **very small**

Holiday Demand (New Year)



- Demand New Year day (1/1) is **higher than the days that follow closely**
- Demand is very high on 1/5, but it's **hard to say whether it's due to the impact of new year day**.

Holiday Demand (Thanksgiving)



- The demand in the Thanksgiving week is **almost identical to the previous demand patterns**
- The influence of thanksgiving on demand of cab service is **very little**

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Conclusion

- Yellow & Pink Companies have **similar characteristics** in
  - Seasonality of demand
  - Customer income, gender, age, payment method structure
- XYZ company should invest in **Yellow Cab**
  - Yellow Cab is **more profitable** throughout the entire period
  - Yellow Cab has significantly **higher proportion of loyal customers**
  - Takes up the **majority of business in most cities**

Thank You