Classifying Customer Feedback (Grab Services)

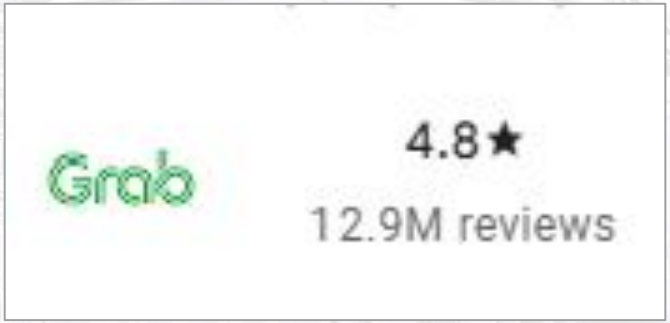
Irfan, Zheng Gang, Ng Wei

Content

- Why is it important?: Sentiment Analysis for Grab
- Challenge when analysing app reviews
- Reddit Data & Initial Findings
- Modelling & Evaluation
- Conclusion & Recommendations
- Streamlit Demo

Why is it important?: Sentiment Analysis for Grab

How are we doing?



How are we doing?

Grab

4.8★

12.9M reviews

How are we doing?

Grab

4.8★

12.9M reviews

Rating of 4.8 stars means that our customers are happy?

Sentiment Analysis of App Store Reviews*

*Based on Google play store comment reviews using Hugging Face BERT Sentiment Analysis. Not drawn to scale.

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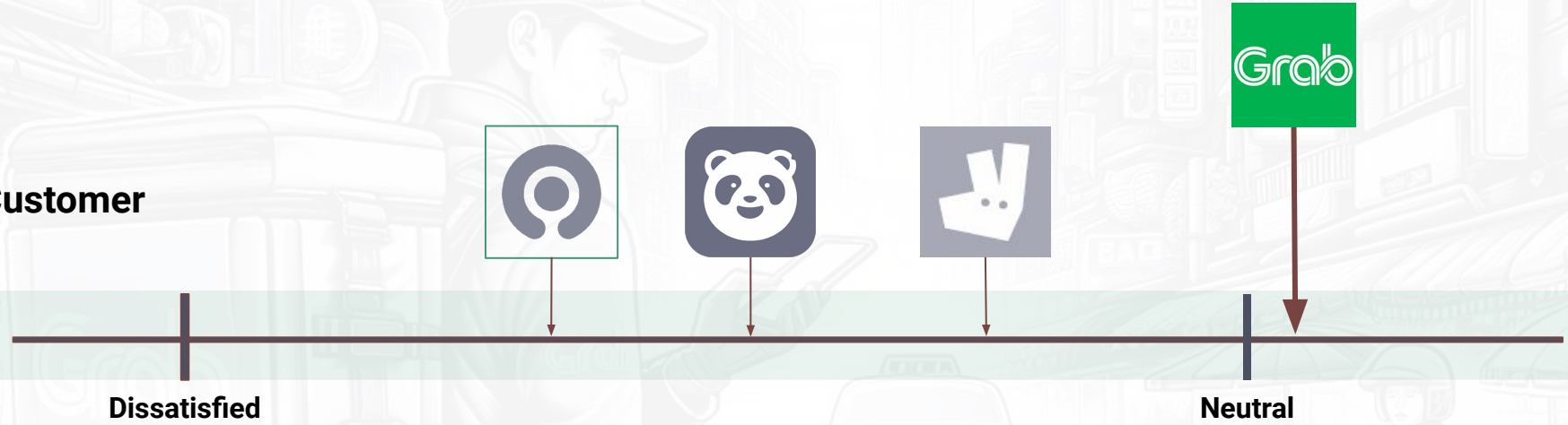

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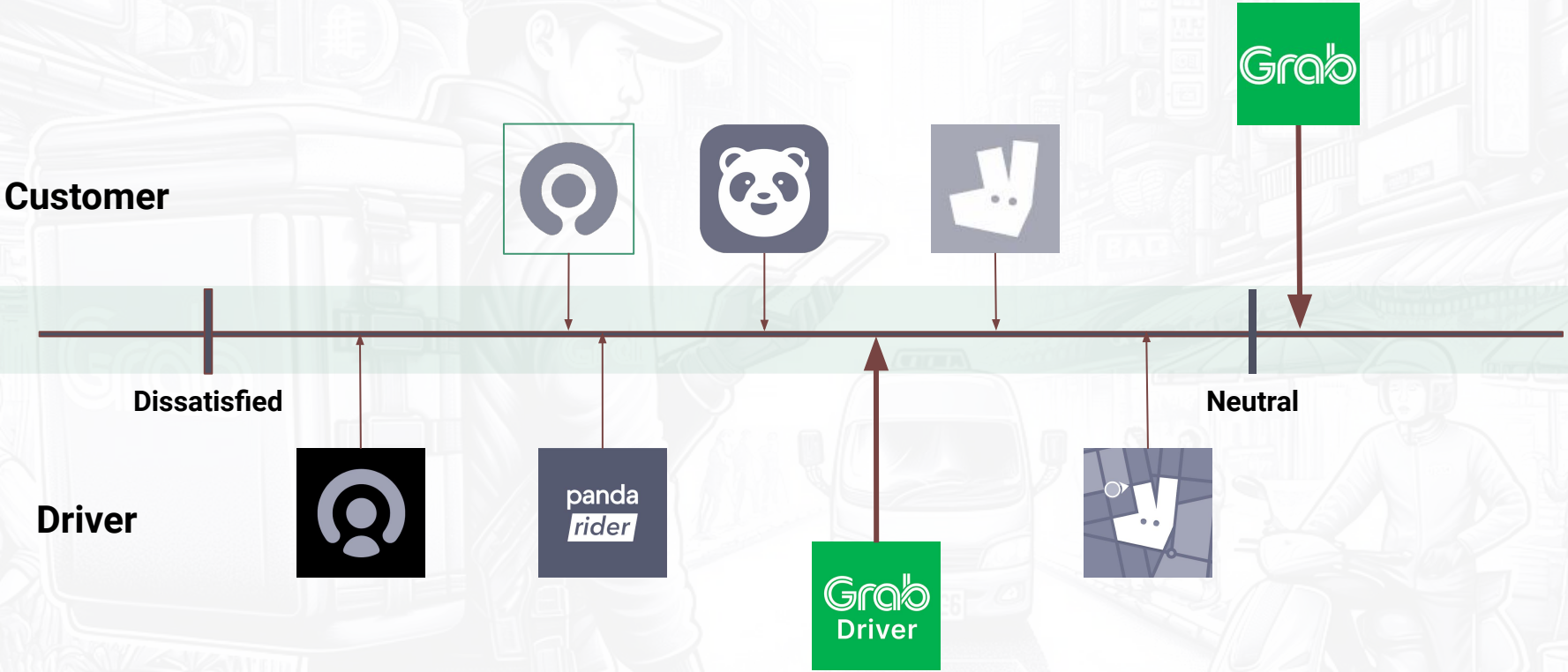

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Sentiment Analysis of App Store Reviews*

The sentiment of driver app for Grab is second after D'roo

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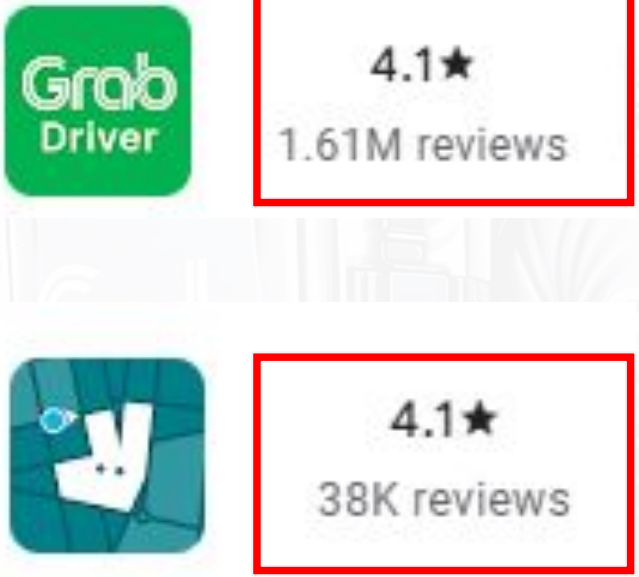


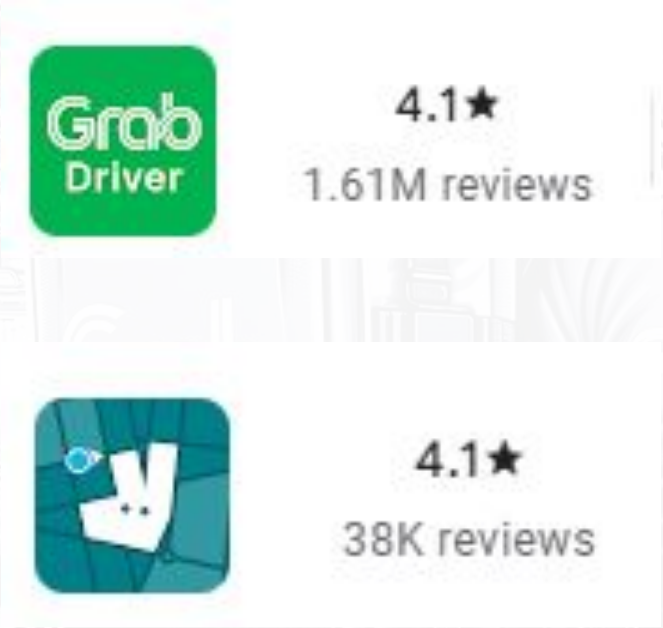
Same Rating

Sentiment Analysis shows otherwise

Grab Driver

4.1★
1.61M reviews

4.1★
38K reviews



It is important to analyse the app store reviews to gain insights on our users' sentiments.

App Ratings do not show the full picture.

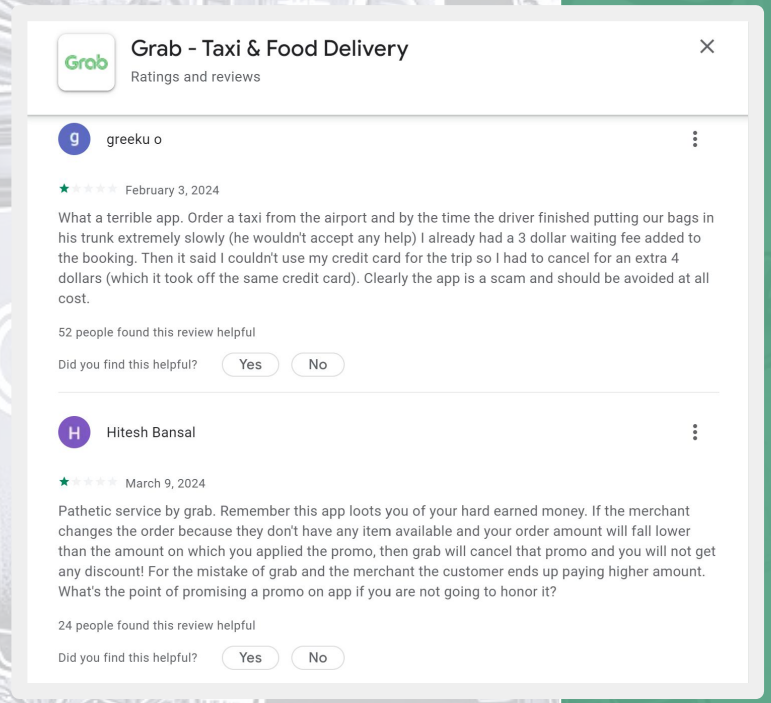
Persona & Problem Statement

Greg

Profile: 30-year-old, Product Manager

- **Oversees the product feature pipeline.**
- **Need to differentiate and prioritize features between ride hailing and delivery due to limited tech resources.**
- **Aim to extract actionable insights via reviewing app reviews on app store.**

Reviews.....



Grab - Taxi & Food Delivery

Ratings and reviews

g greeku o

★ February 3, 2024

What a terrible app. Order a taxi from the airport and by the time the driver finished putting our bags in his trunk extremely slowly (he wouldn't accept any help) I already had a 3 dollar waiting fee added to the booking. Then it said I couldn't use my credit card for the trip so I had to cancel for an extra 4 dollars (which it took off the same credit card). Clearly the app is a scam and should be avoided at all cost.

52 people found this review helpful

Did you find this helpful? Yes No

H Hitesh Bansal

★ March 9, 2024

Pathetic service by grab. Remember this app loots you of your hard earned money. If the merchant changes the order because they don't have any item available and your order amount will fall lower than the amount on which you applied the promo, then grab will cancel that promo and you will not get any discount! For the mistake of grab and the merchant the customer ends up paying higher amount. What's the point of promising a promo on app if you are not going to honor it?

24 people found this review helpful

Did you find this helpful? Yes No

[Google Play Store]

Reviews.....

Ride Hailing

Grab - Taxi & Food Delivery

Ratings and reviews

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Reviews.....

Ride Hailing

Delivery

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[Google Play Store]

Greg

Role: Product Manager

Challenge:

Overwhelmed by vast user reviews; struggles to classify reviews between delivery and ride hailing.

Problem Statement

How can we **distinguish** between customer feedback related to Grab's **ride-hailing** and **delivery** **fast** and **accurately?**

Research (Reddit)

Why Reddit ?

Easy to use Public API

Why Reddit ?

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Industry Specific Threads

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Industry Specific Threads

Substantial Data Volume

Why Reddit ?

Easy to use Public API

Industry Specific Threads

Substantial Data Volume

Negative Sentiment

Our Data……

Uber

Grab equivalent

Ride Hailing

Subreddit with **53k members**

Subreddit.....

Uber

Grab equivalent

Ride Hailing

Subreddit with **53k members**

UberEats

Grabfood equivalent

Food Delivery

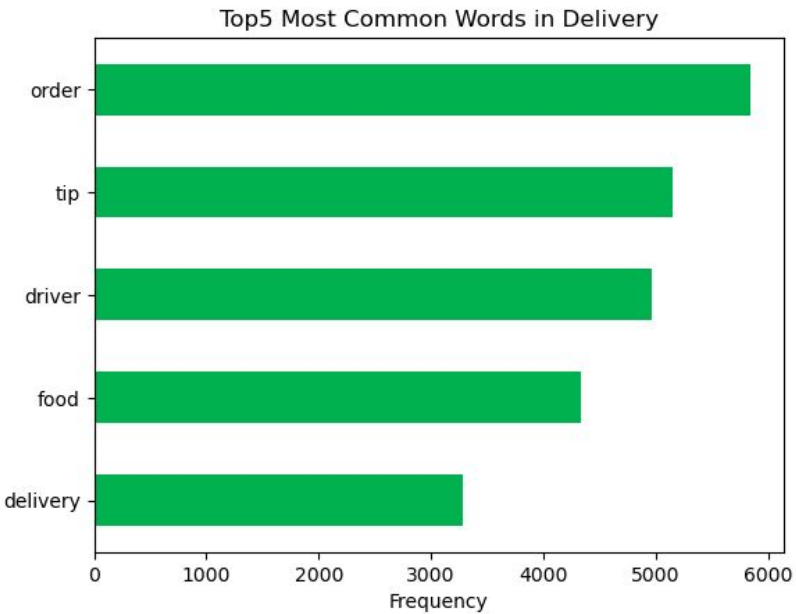
Subreddit with **143k members**

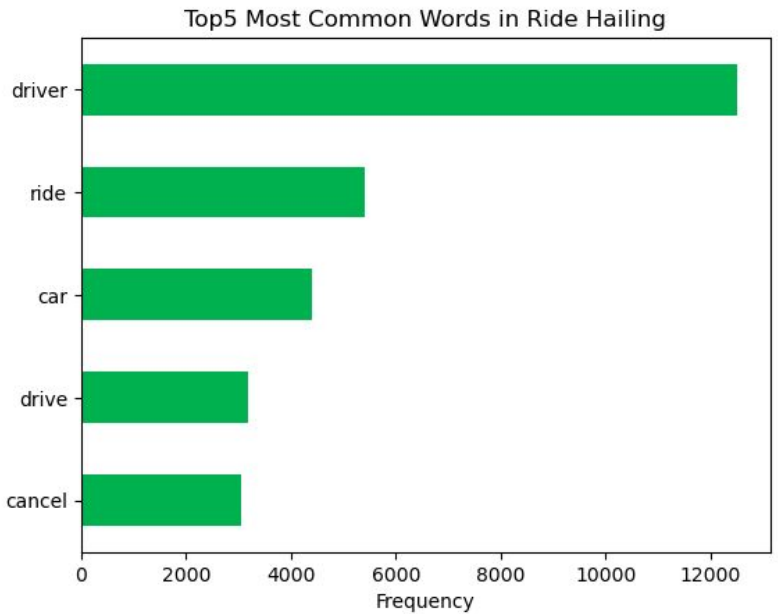
Initial Findings

Key Term Differences

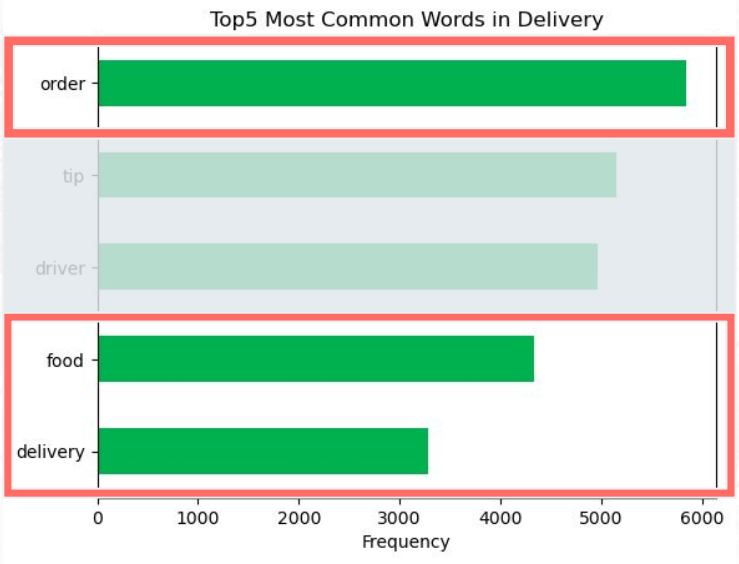
Delivery	Ride Hailing
Order	Ride
Customer	Passenger

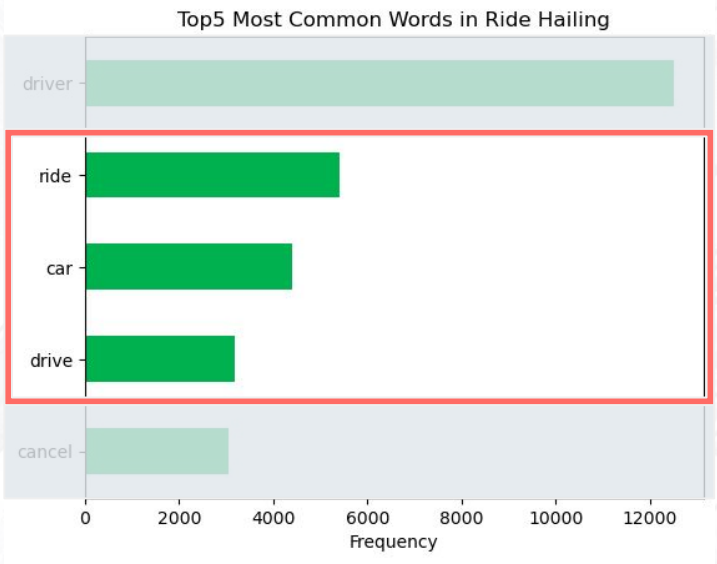
Frequency analysis





Frequency analysis



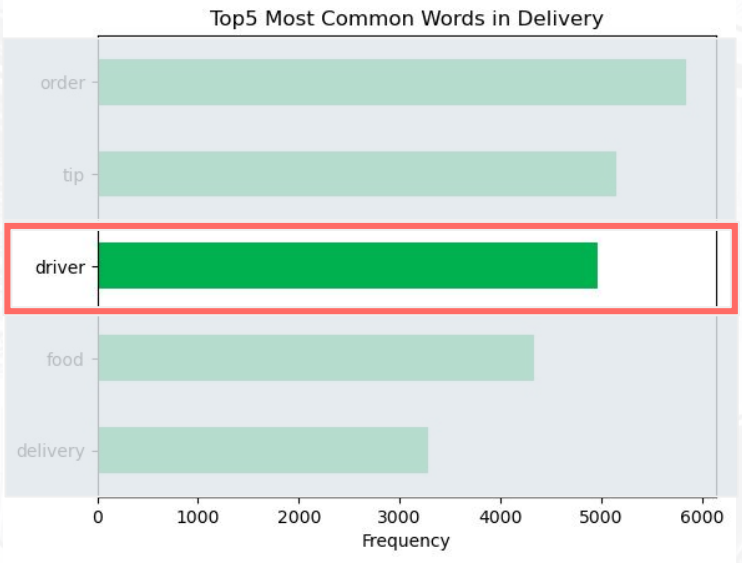


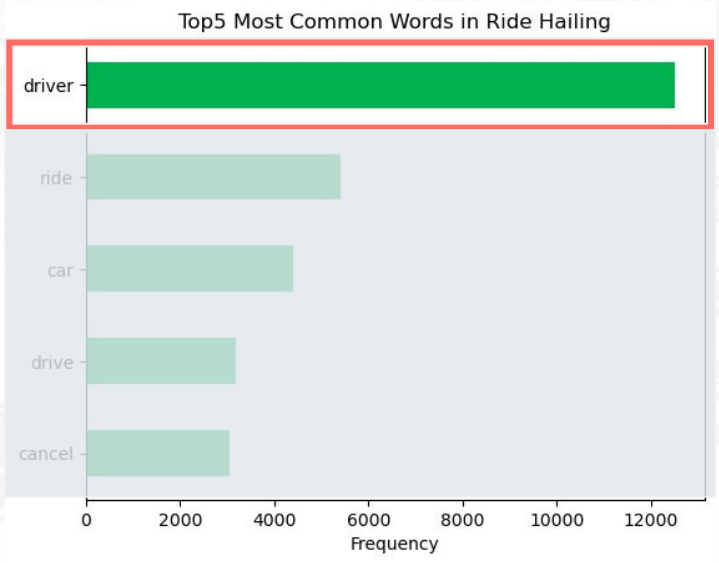
As expected, we see service type specific words rank high in our frequency analysis:

Delivery: Order, Food, Delivery

Ride Hailing: Ride, Car, Drive

Frequency analysis





However, we also see a word that rank high in frequency for both.
Example: Driver

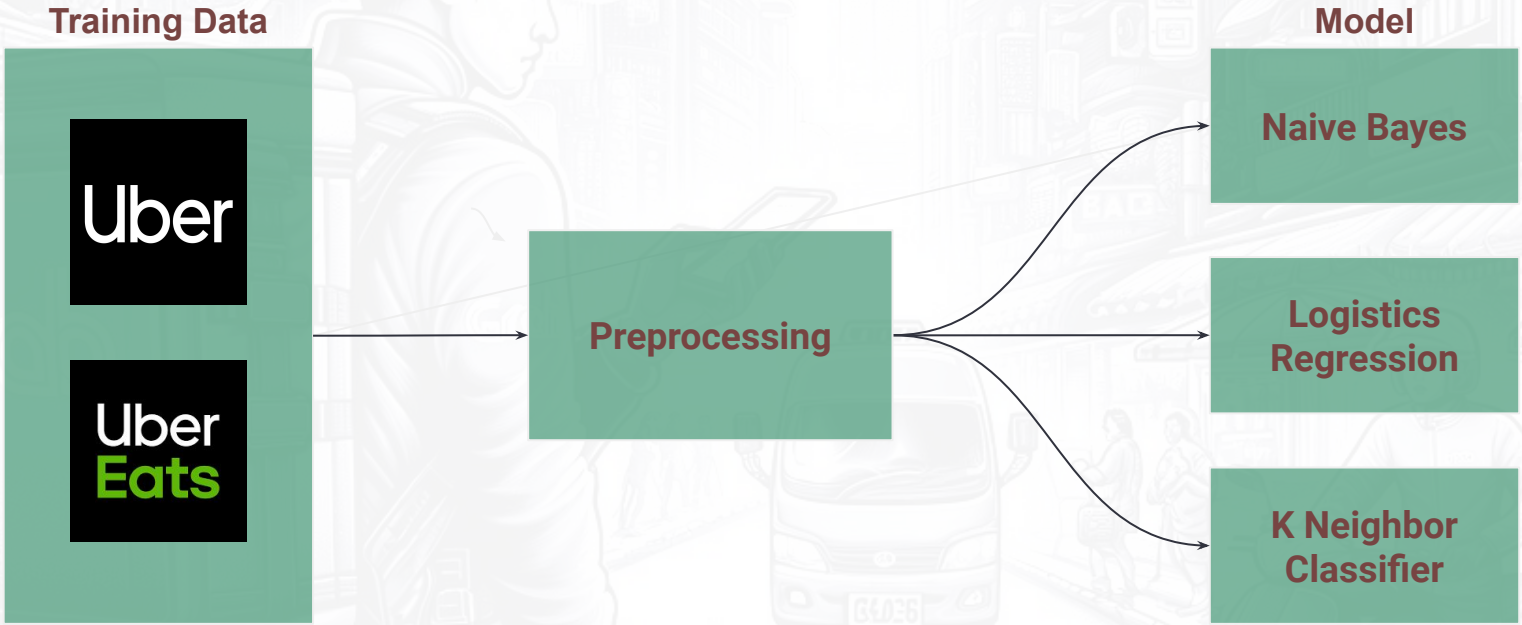
We do not remove them as their frequency plays a part.
Example: Driver appears much more in ride hailing than in delivery.

Problem Statement

How can we **distinguish** between customer feedback related to Grab's **ride-hailing** and **delivery** **fast** and **accurately?**

Modelling

Modelling Process



Model Selection

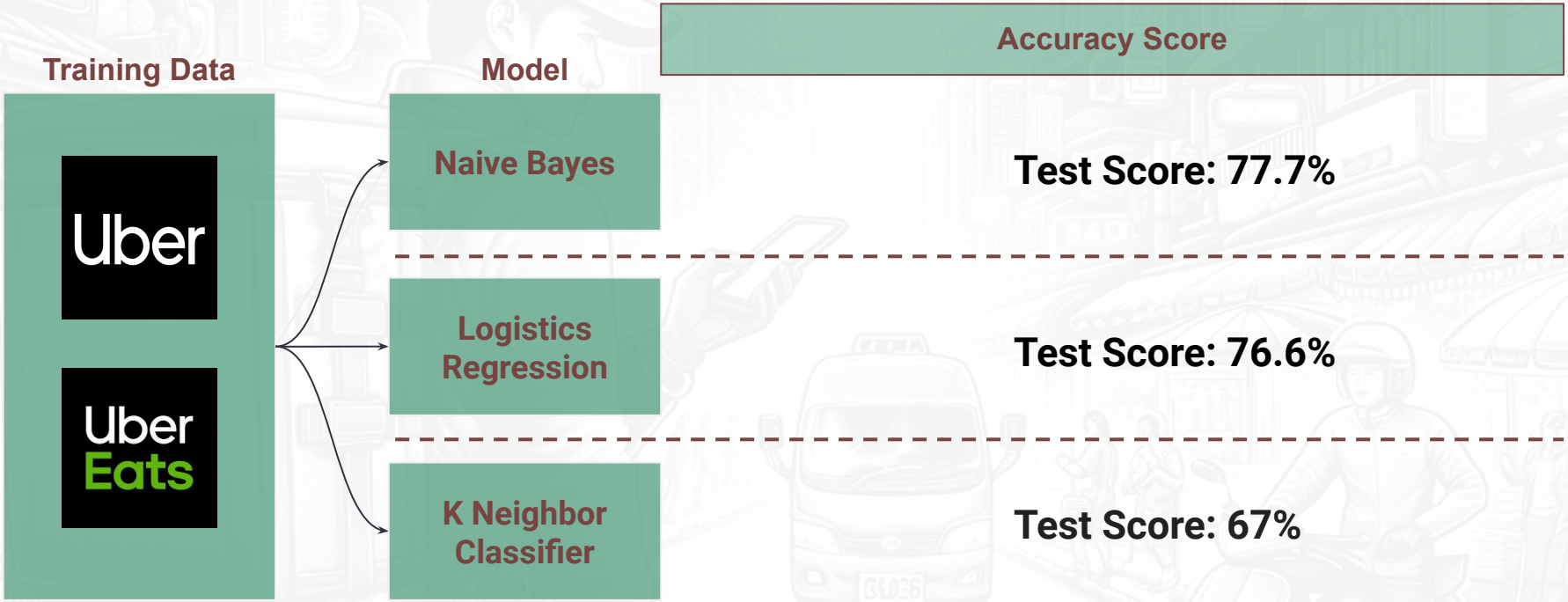
Maximizing Accuracy Score

- Select model with highest accuracy score
- Accuracy score measures the proportion of posts correctly predicted to the total number of posts

Why?

- Predicting a ride-hailing post as delivery has the same negative impact as predicting a delivery post as ride-hailing.

Subject training data to different models...



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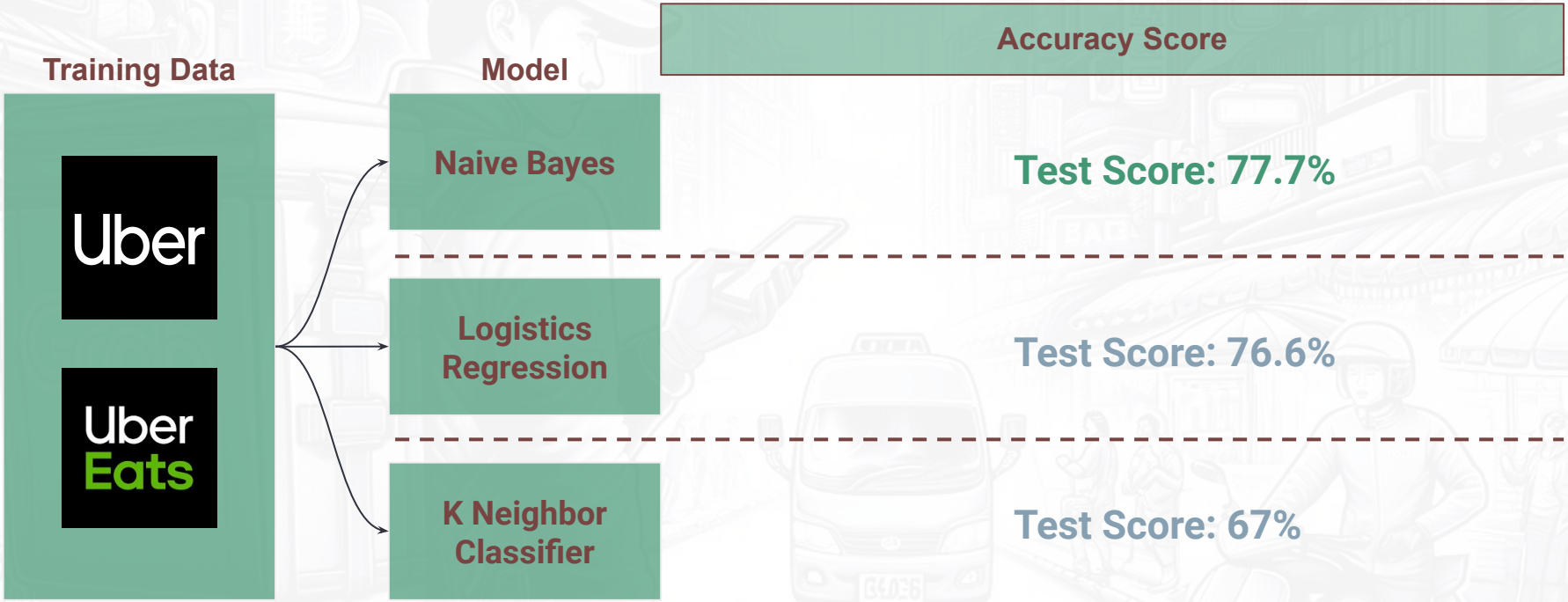

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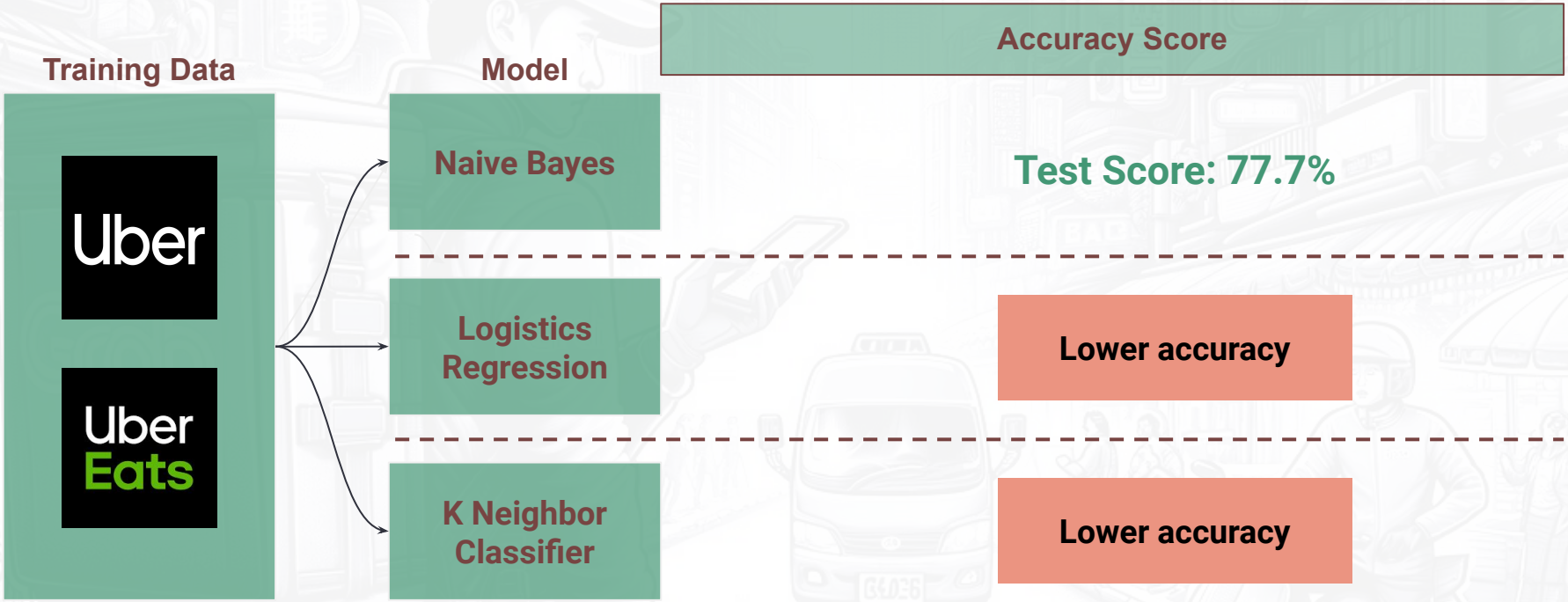


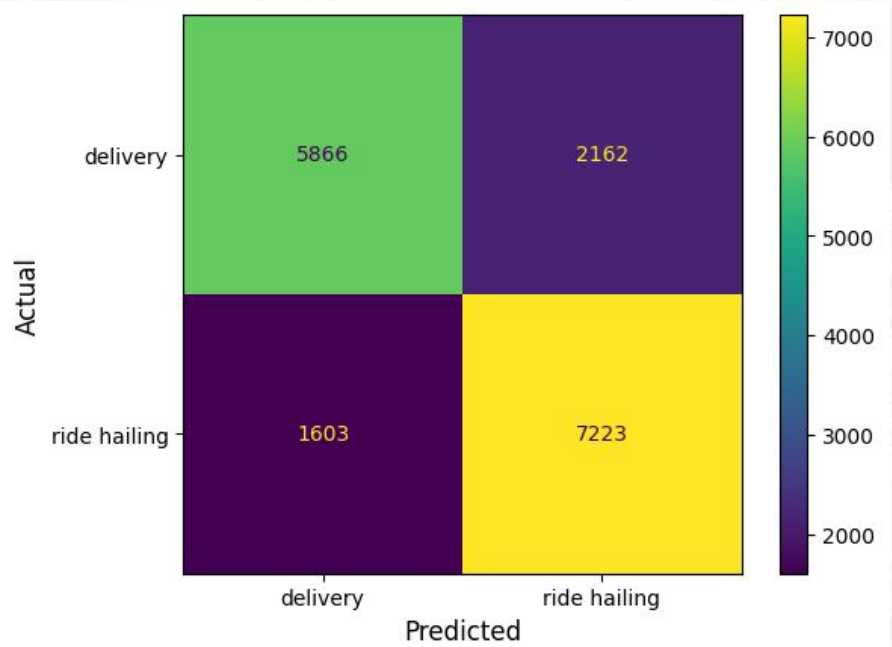
Comparing computational intensity...

Classification Algorithms: KNN, Naive Bayes, and Logistic Regression
by Brandon Wohlwend

Efficiency: Naive Bayes classifiers are incredibly fast compared to more sophisticated methods. This is because they decouple the class conditional feature distributions, so you can independently estimate each feature's distribution and then multiply them together to obtain the required result.

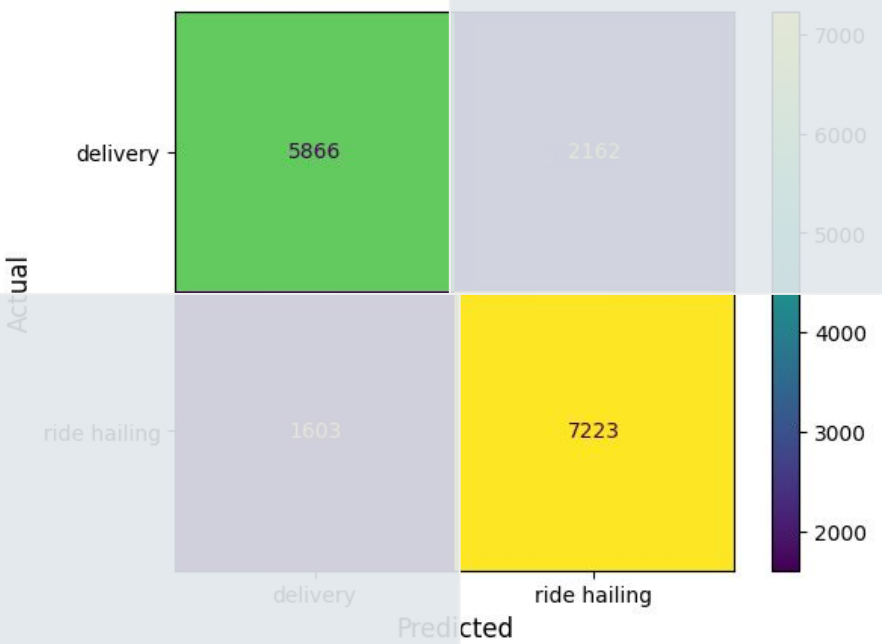
Model Evaluation

Confusion Matrix



Confusion Matrix

Correctly Predicted 73% of delivery comments



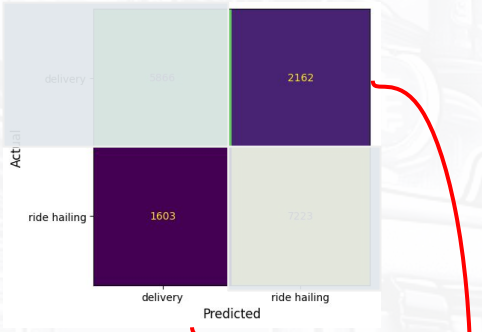
Correctly Predicted 81% of ride hailing comments

Confusion Matrix

Wrong
Predicted: Ride Hailing
Actual: Delivery

Wrong
Predicted: Delivery
Actual: Ride Hailing

Among those that was wrongly classified….



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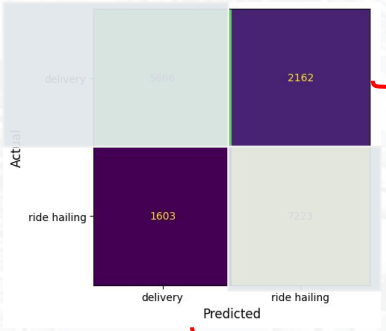

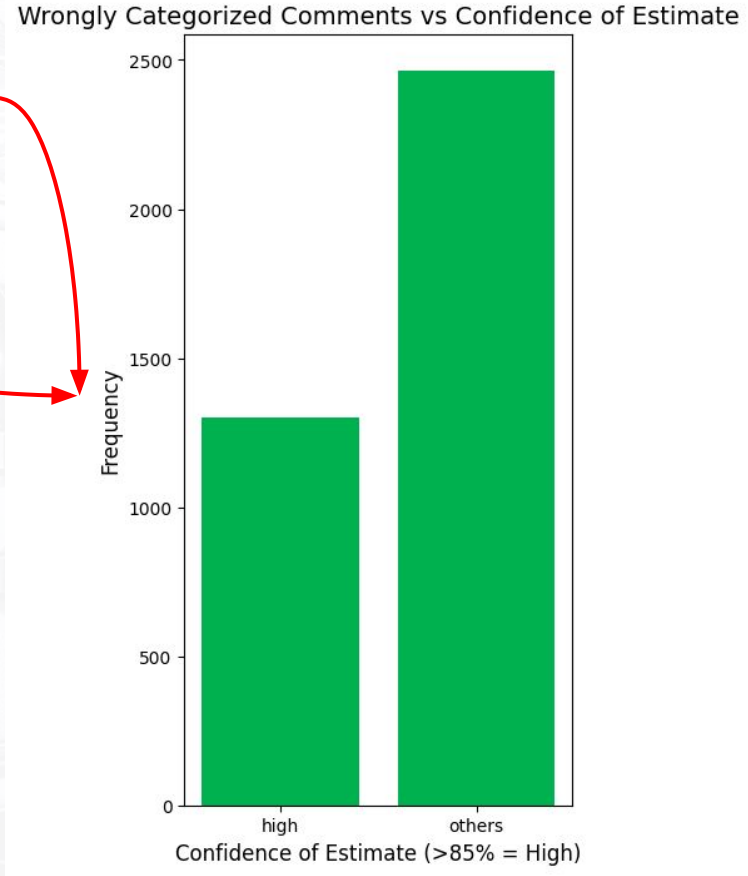

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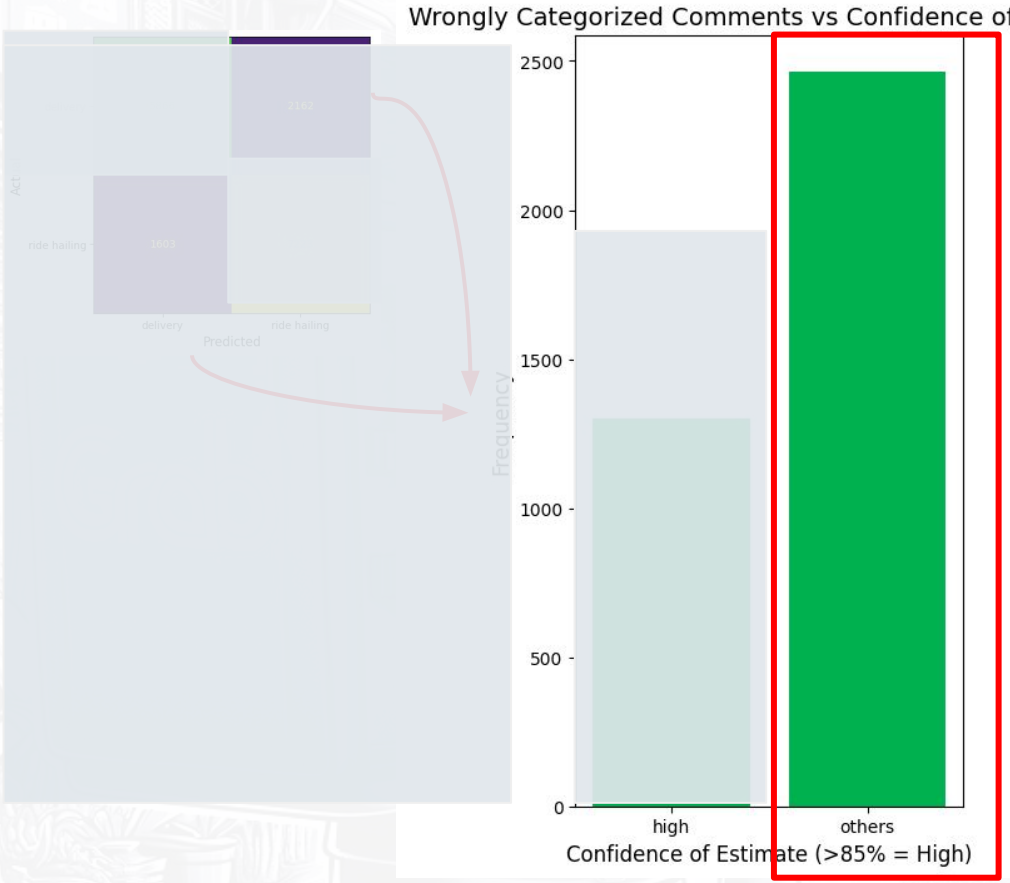

Comments classified with low level of confidence

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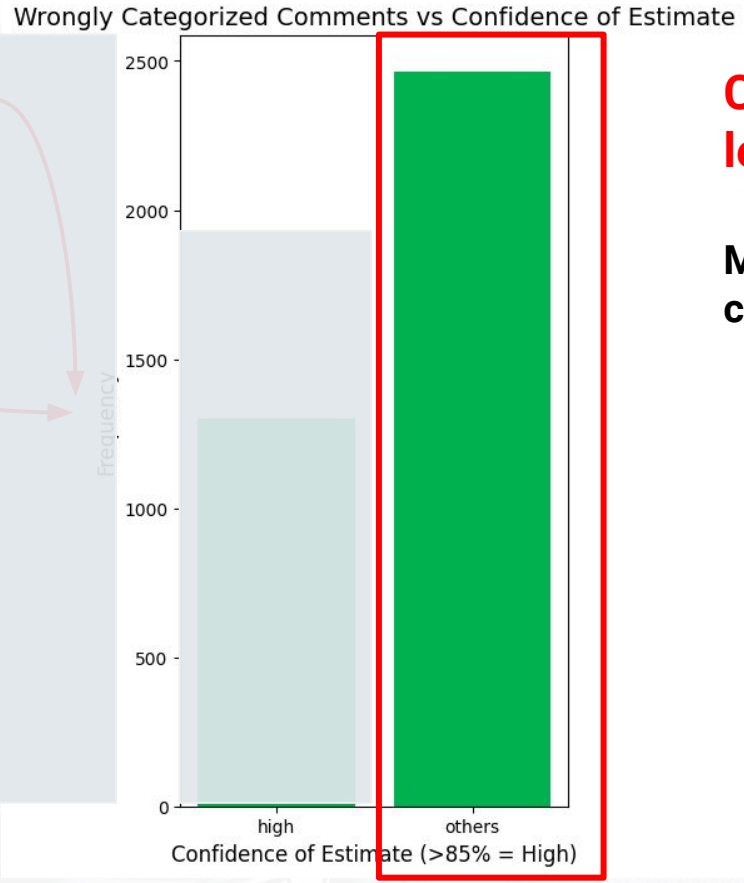

Comments classified with low level of confidence

Model is unsure of which classification comment belongs to.

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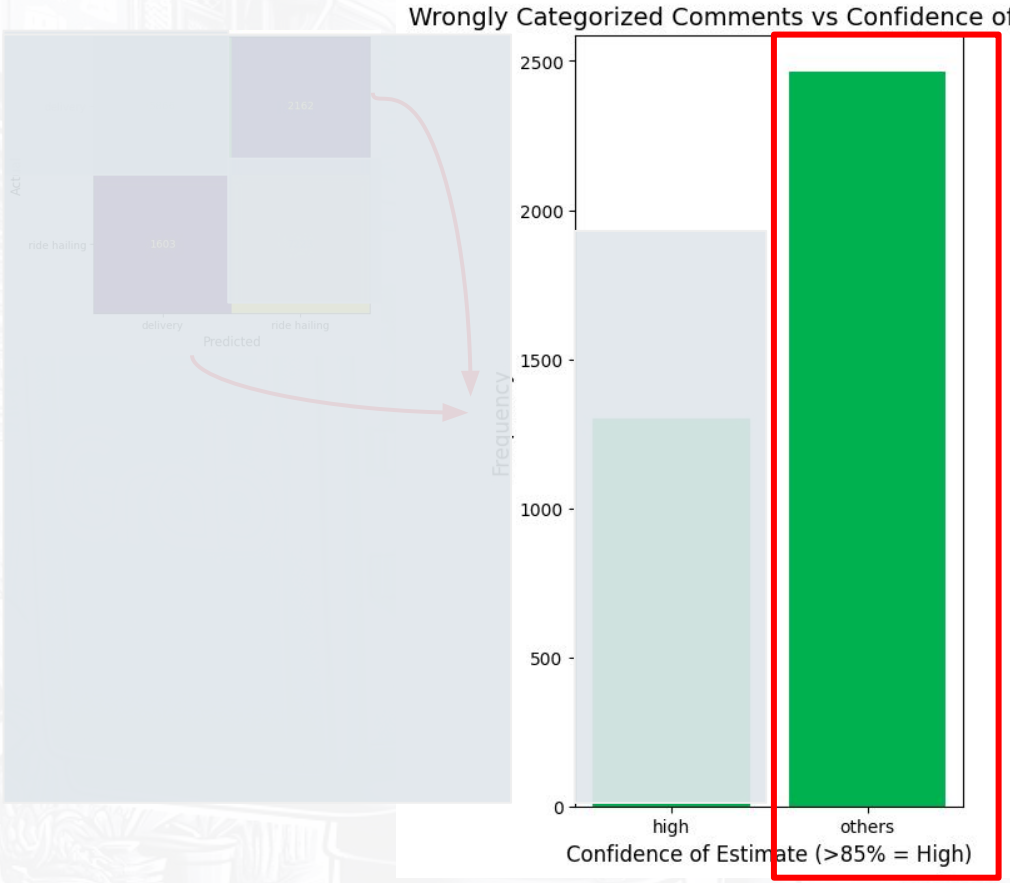


Comments classified with low level of confidence

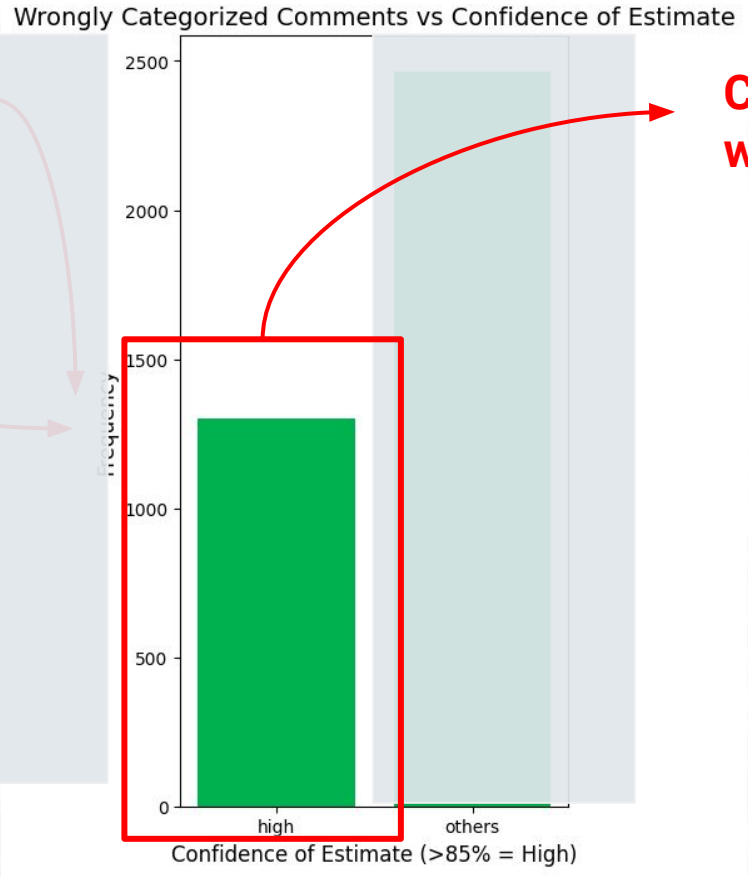
Model is unsure of which classification comment belongs to.

Due to:

General comments

E.g. “glad you could get that off your chest

Among those that was wrongly classified….



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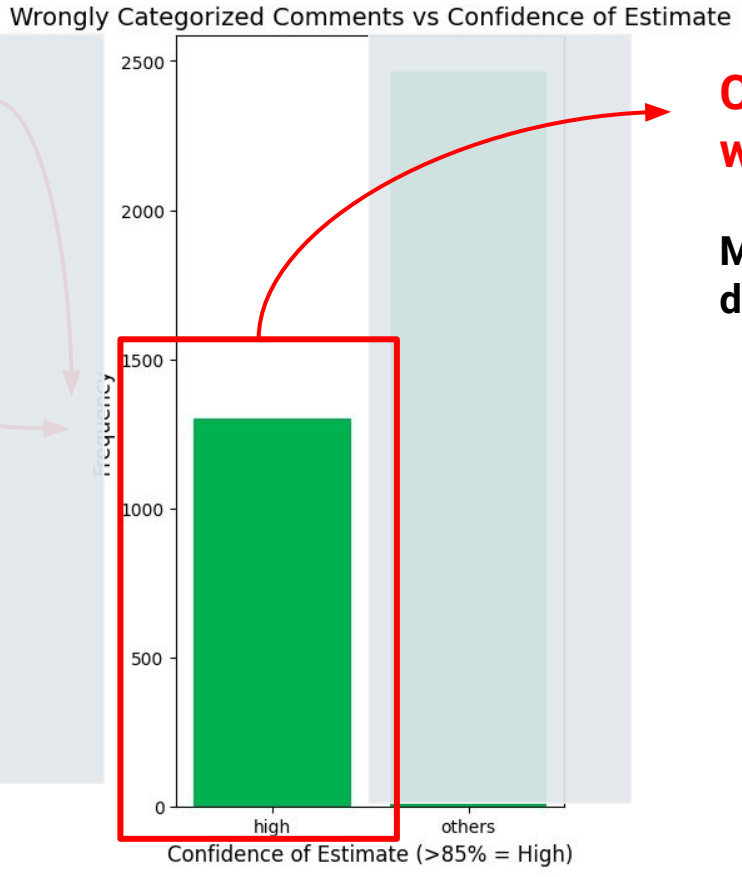

Comments wrongly classified with high level of confidence

Model is very sure but prediction differs from the actual

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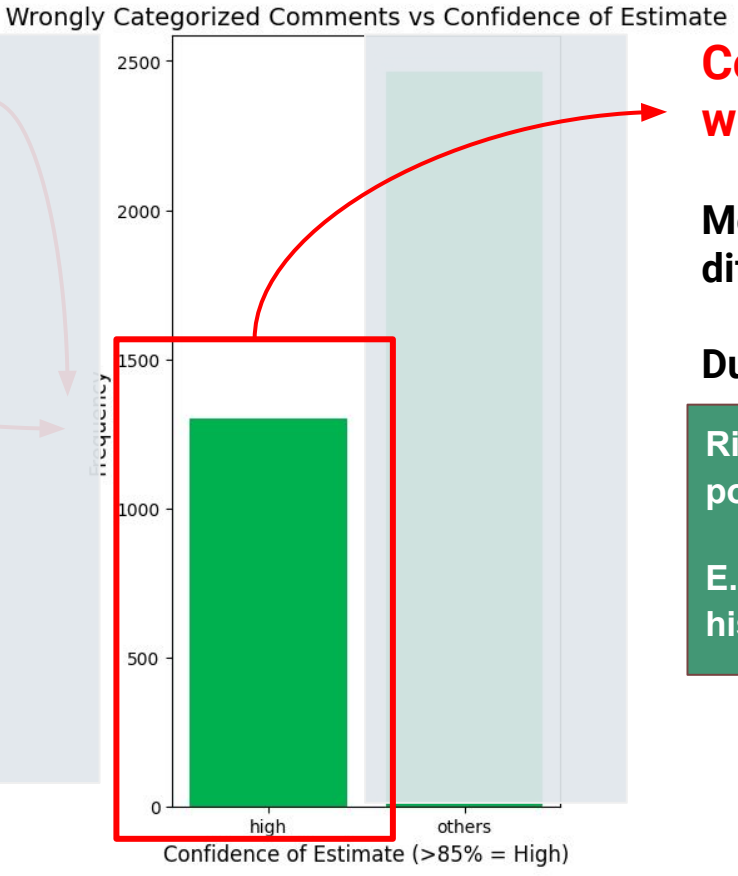


Comments wrongly classified with high level of confidence

Model is very sure but prediction differs from the actual

Due to:

Ride hailing comments that were posted in delivery thread (vice versa)

E.g. “I wouldn't take him & his dog to his destination” in delivery thread.

Our classifier in action - Streamlit

Our classifier in action - Streamlit

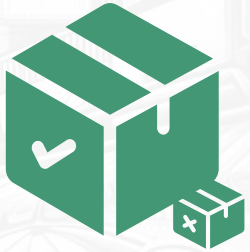
Test:
414 Grab App Reviews

Our classifier in action - Streamlit

Test:
414 Grab App Reviews

Model

Our classifier in action - Streamlit



Test:
414 Grab App Reviews

Model

Accuracy:
82.37%

Conclusion and Recommendation

Problem Statement:

How can we distinguish between customer feedback related to Grab's ride-hailing and delivery fast and accurately?

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Accuracy:

- **77.7% on test data set**
- **82.37% on Grab app reviews**

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Fast:

- **Naive Bayes → computationally inexpensive**
- **Based on prior streamlit demo →**
  - **< 10 sec in streamlit vs 2 hours of manual work**

“I now have more time for value-adding task”

Recommendation

1. Extend training data to include Southeast Asia languages like those from hardware zone forums to address linguistic nuances (e.g., "rider" vs. "driver").

2. Consider a multi-class classifier instead of binary to cover more categories (e.g., GrabPay, app performance).

3.

Thank you