NYC TAXI CLASSIFICATION

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Metis project 4

DATA

NYC Taxi & Limousine Commission

January 2019

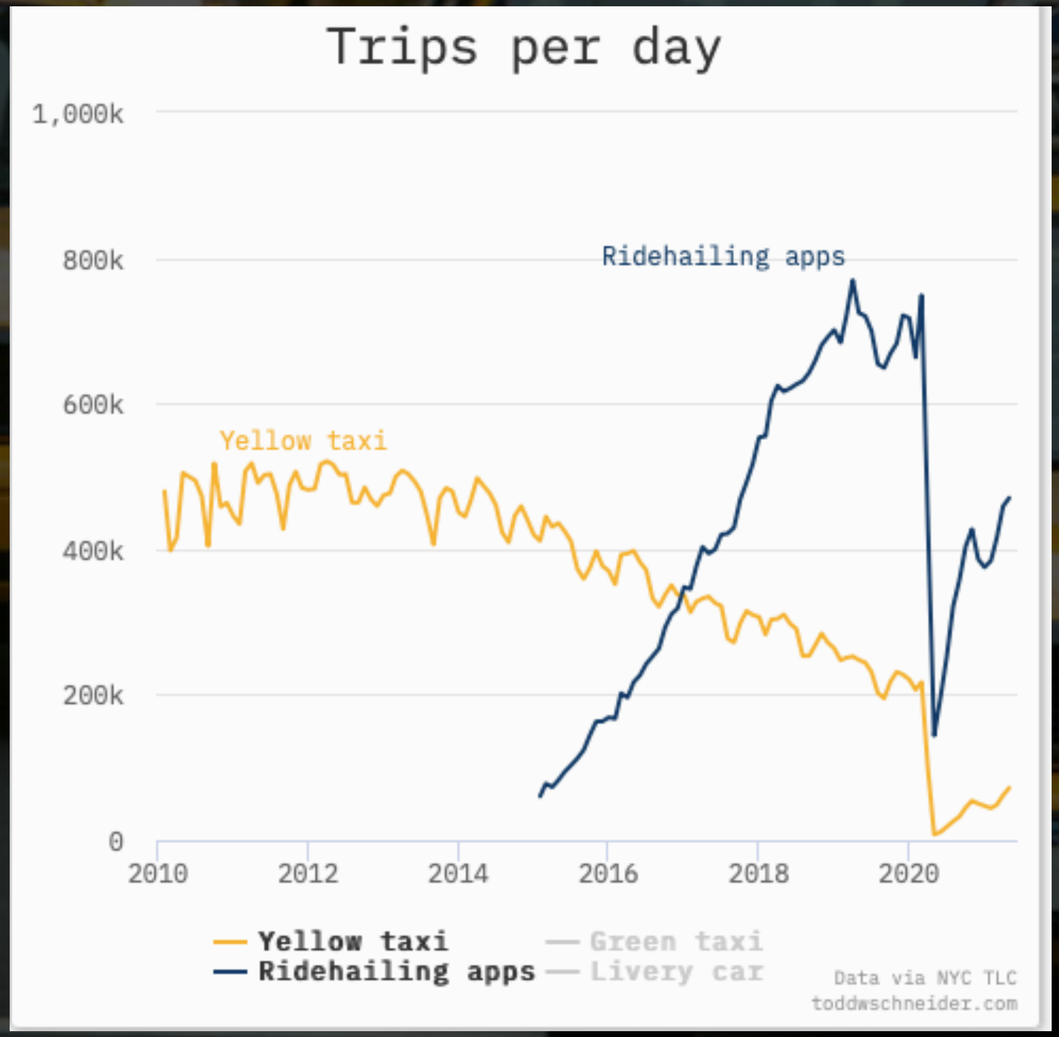
- Date and time of both pickup and drop-off
- Type of ride
- Number of passengers
- Total distance
- Total amount
- Extra charges applied
- Pickup and drop-off location

Final Dataset:

- 5.9 million observations
- 86 features

NEED | Maximizing Profits

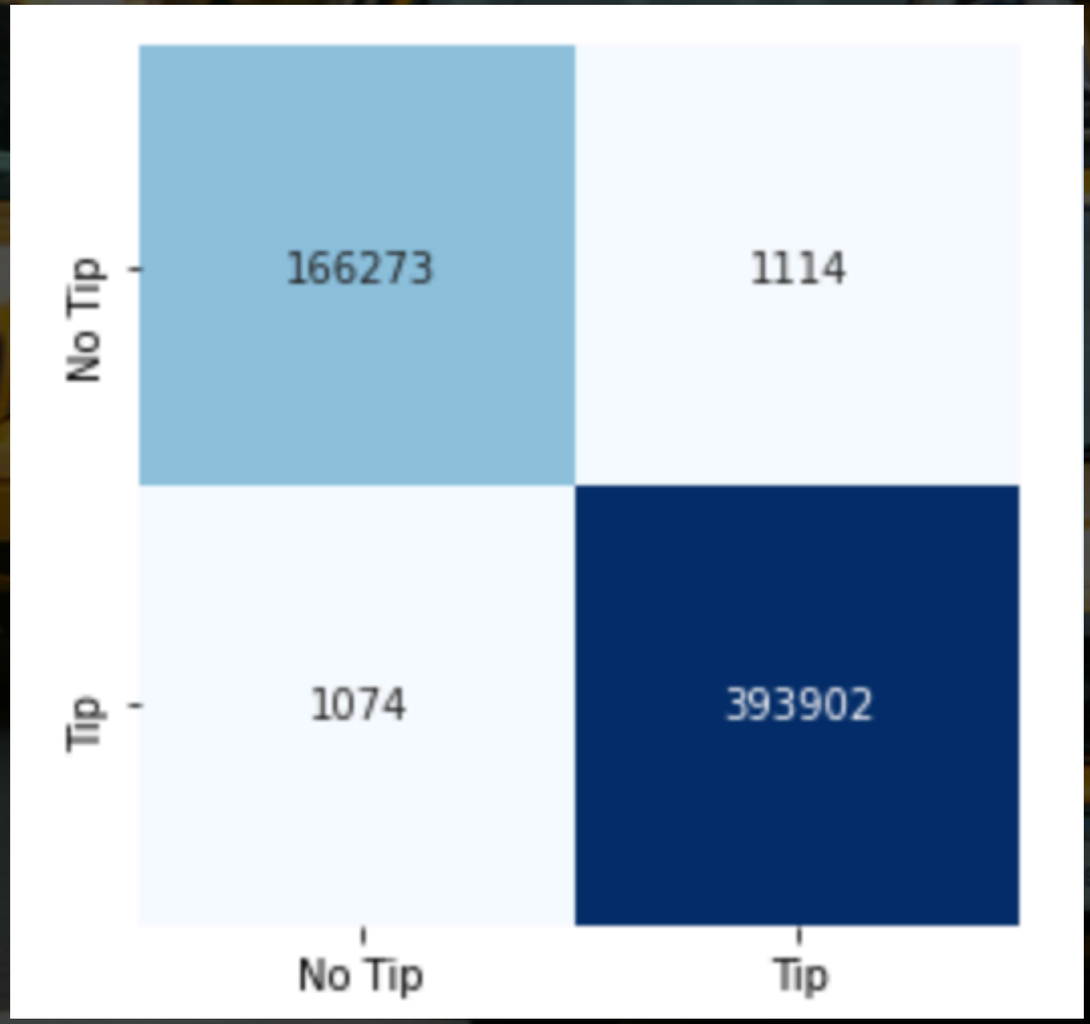
- Over $100 million brought it between yellow and green cars in January 2019 alone.
- With the introduction of ride sharing cars into the market, competition has never been stronger
- Focus on precision, minimizing false positives
- Graph pulled from toddwschneider.com



Initial Scoring

- Metrics across all baseline models were performing very well.
- Still too many false positives
- Missing categorical features for interpretation

Logistic Regression Confusion Matrix

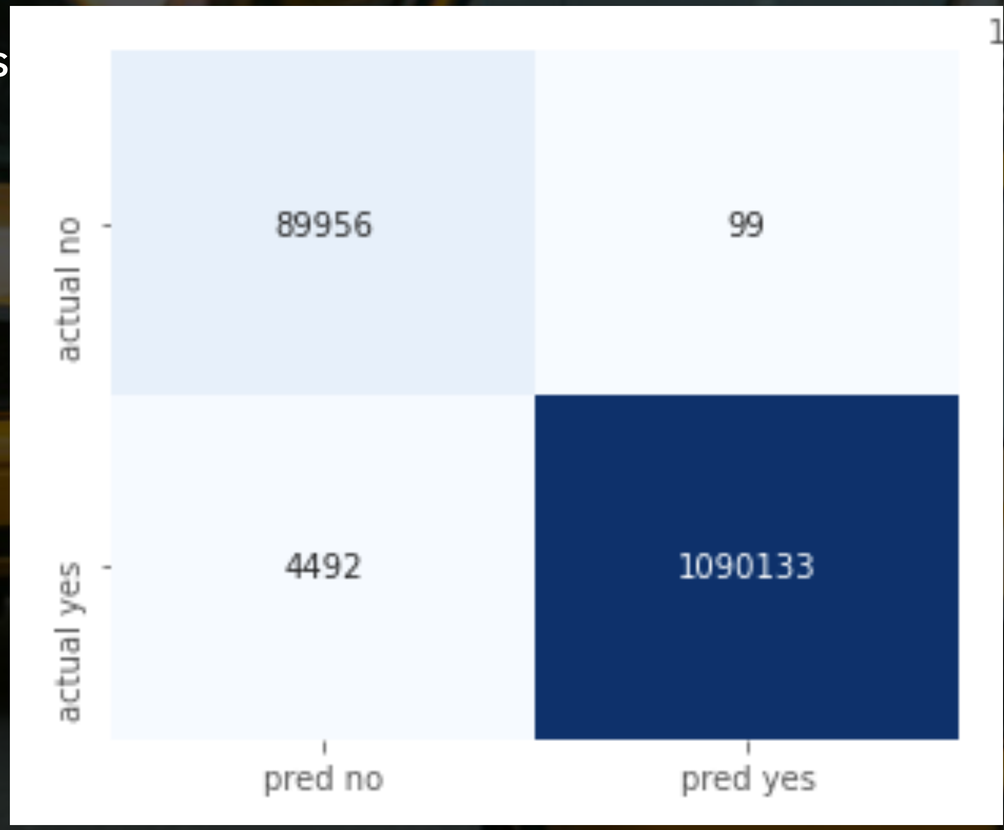


Continuing with Logistic Regression

- After adding all categorical features, false positives jumped significantly to over 8 thousand.

- After tuning Hyperperameters, I was able to drop the false positives to under
  - C=.8
  - Class Weight: 0:12, 1:1
- Precision and Recall stayed at 99%

- Log los



Feature importance Coefficients

5 largest positive coefficients:

- Ratecode_standard
- JFK ride
- Ratecode_negotiated
- Credit payments
- Newark ride

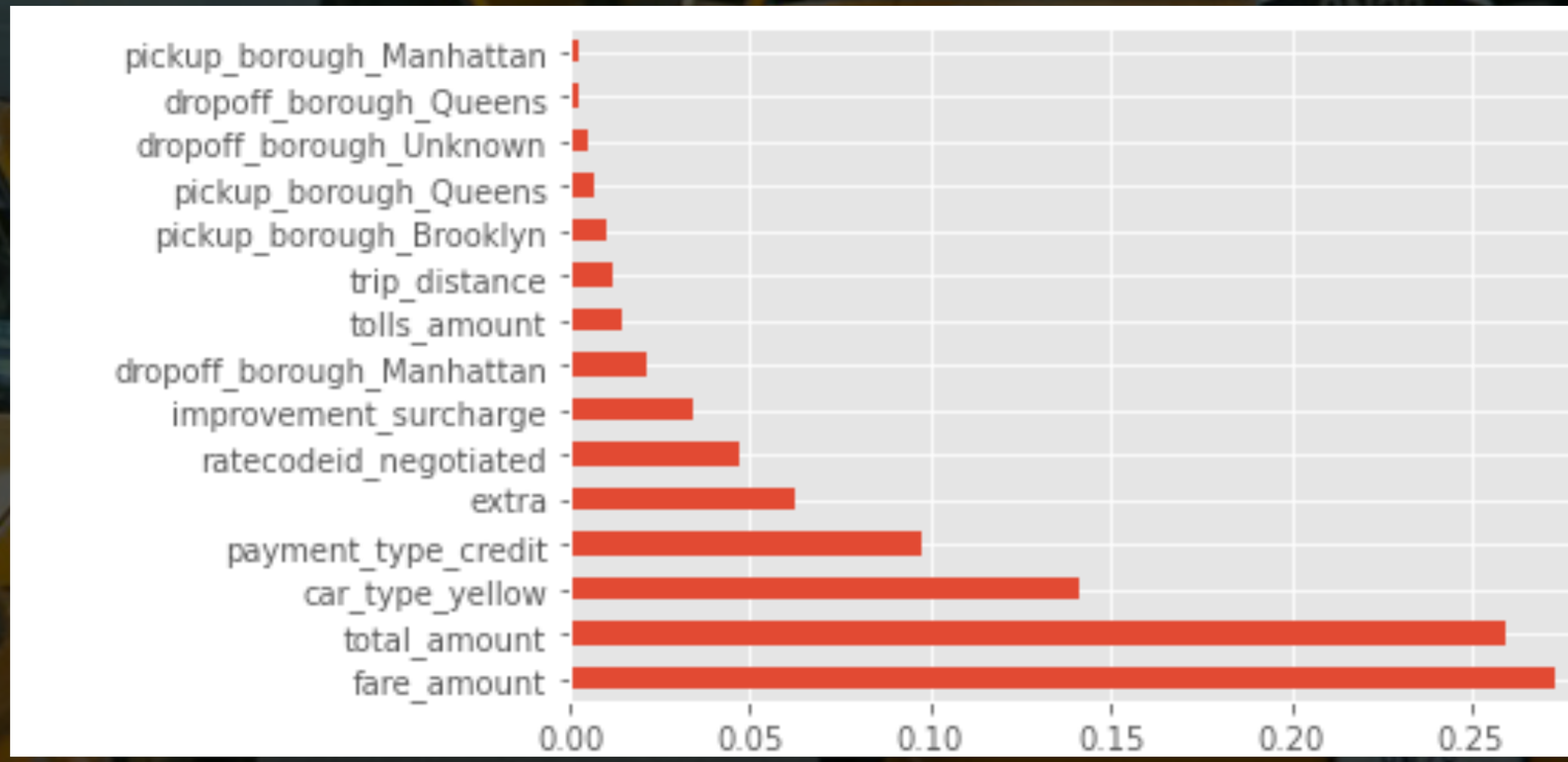
5 largest negative coefficients:

- Fare amount
- Tolls
- Extra fees
- 7am
- 8am

Feature importance

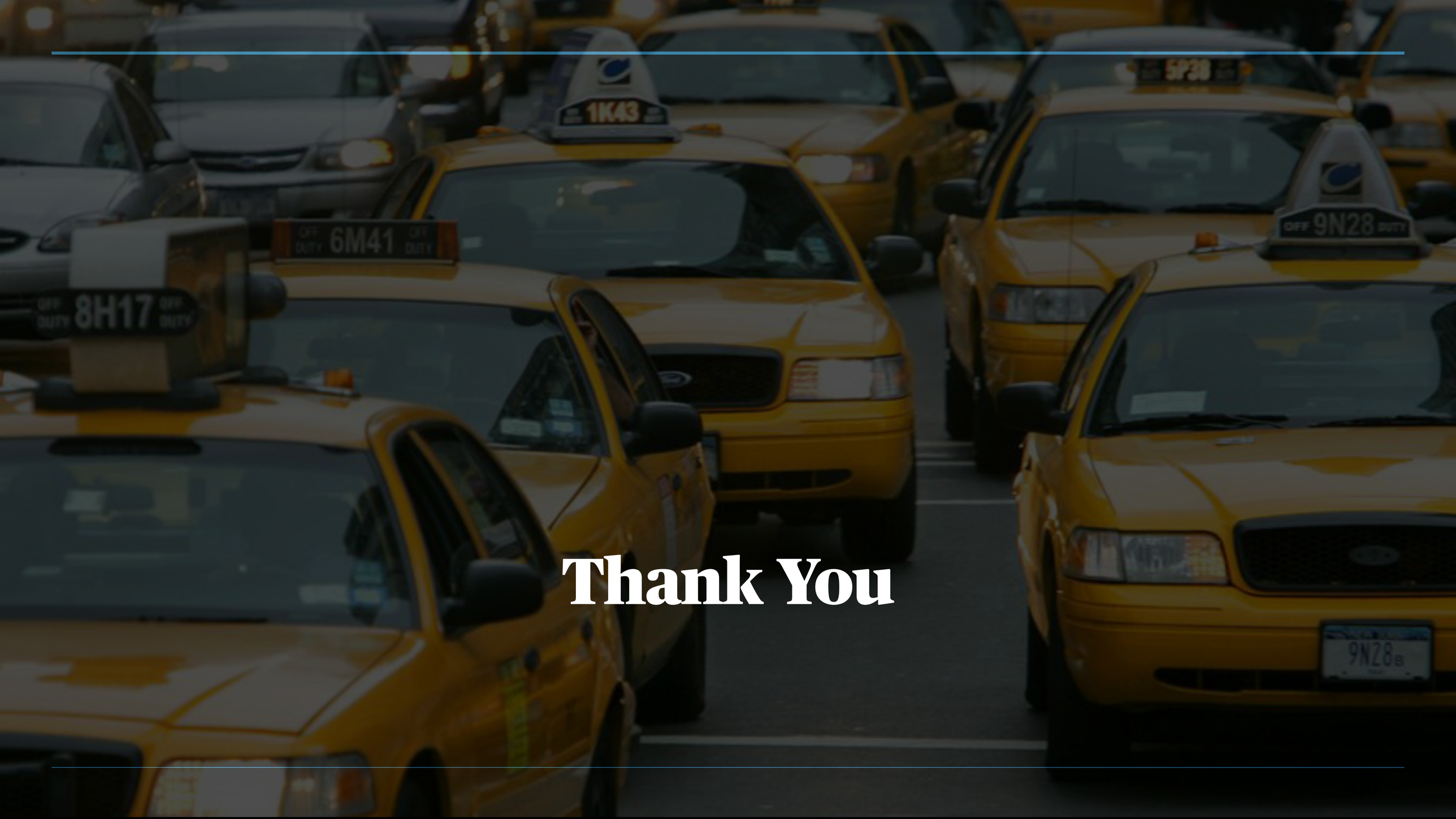
- Using the tree models I also worked with, I extracted feature importances

- Most impactful features include
  - Fare amount
  - Being a yellow cab
  - Paying with credit
  - Negotiating your own fare
  - Being dropped off in Manhattan



Future work

- In the future I would like to move to a cloud computing service, to allow these models to be done on a larger scale
- Combining multiple models together into an ensemble to see if it improves scores.



Thank You