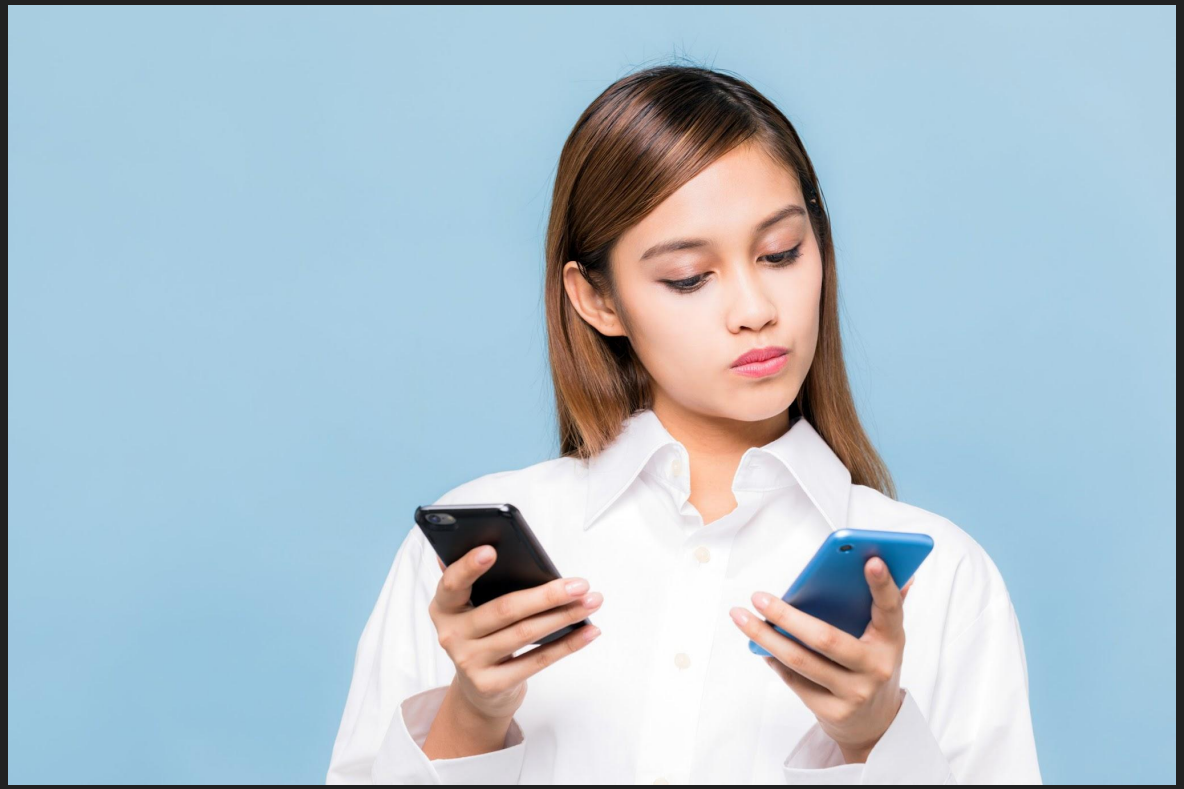
Hammer Consultants

Churn Predictor
For Telecom Customer Retention Plan

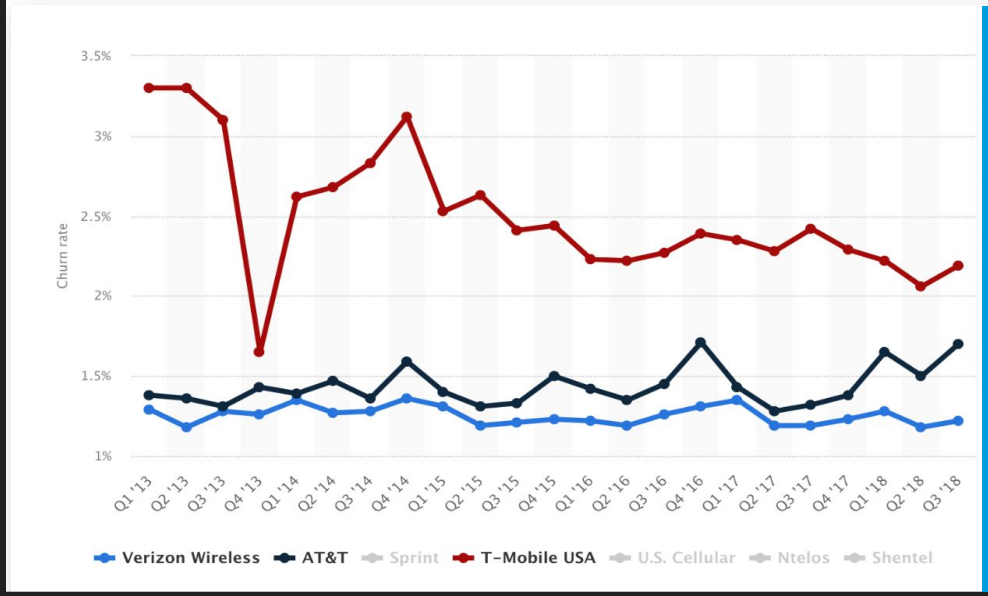
October 2023

Goal: Predict Telecom Customer Churn Using a Binary Classifier



Stakeholder: Telecom Providers Looking to Reduce Churn!

Average monthly churn rate for wireless carriers in the United States from 1st quarter 2013 to 3rd quarter 2018

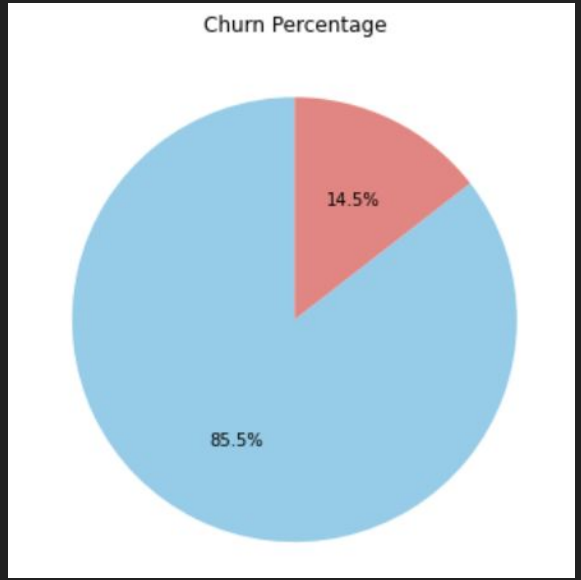


Understand the Data

1. Dataset containing 3333 rows and 21 columns
2. Data from SyriaTel of 3333 customers over 9 months
3. No missingness, target variable is churn
4. Metric for optimization - recall: we want to catch as many people who may churn as possible, without much concern for false positives
    a. It is 6X more expensive to acquire a new customer as it is to stop a customer from churning

Churn Rate & Features to Predict

- 14.5% of customers churn in the dataset
- There are 6 Features that have a >7% correlation to churn and are included in the model



Dummy Classifier

Decision Tree Confusion Matrix

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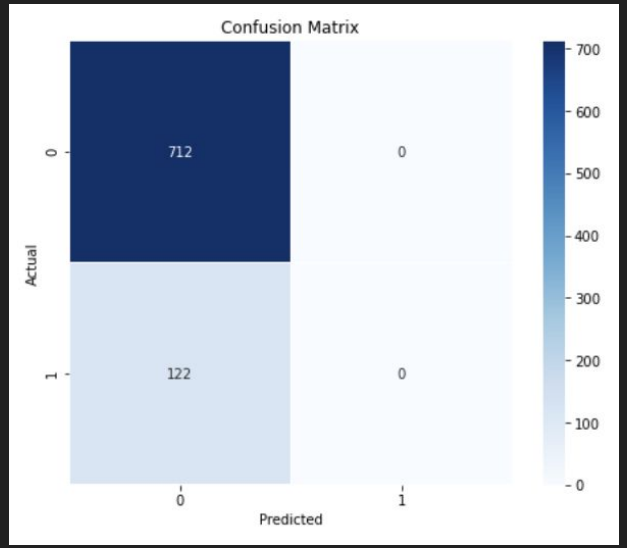


This model can act as the null hypothesis

Accuracy: 0.85

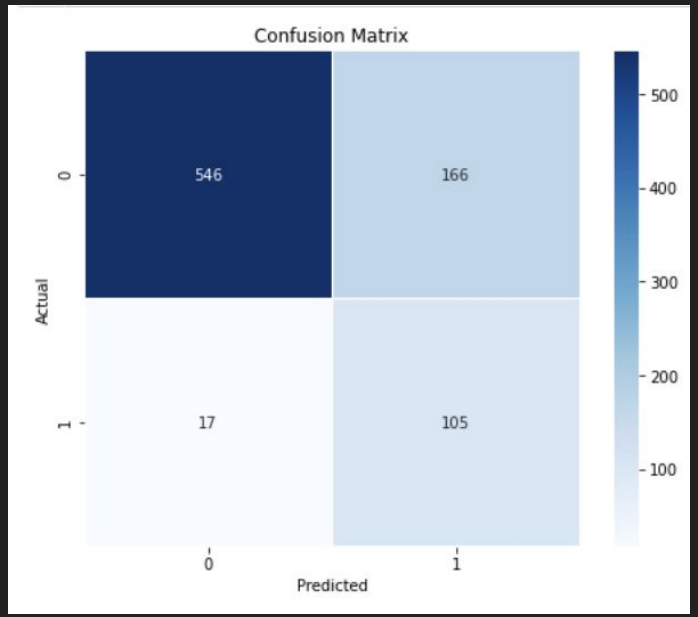
Precision: 0.00

Recall: 0.00

AUC: 0.50

Decision Tree

Decision Tree Confusion Matrix



The model's decision making process is modeled like a tree, with nodes representing features and branches of possible outcomes

After hyperparameter tuning we get:

Accuracy: 0.78

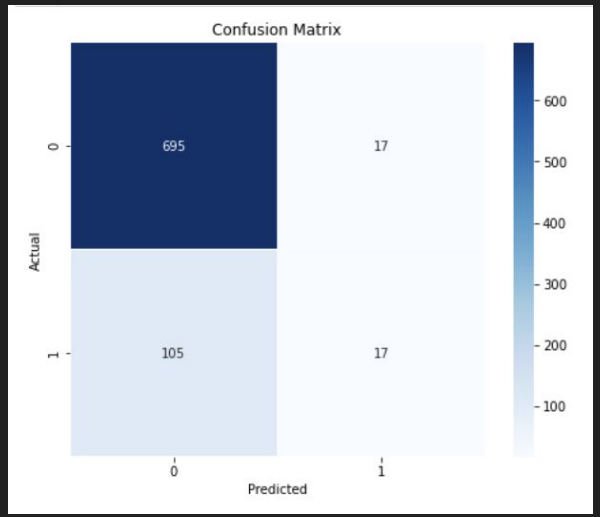
Precision: 0.39

Recall: 0.86 (0.64 before hyper-parametrization)

AUC: 0.81

Logistic Regression

Logistic Regression Confusion Matrix



The model's decision making process estimates the probability of an event happening based on a given dataset of independent variables

*Note: Hyperparameter tuning does not improve the model here:

Accuracy: 0.76

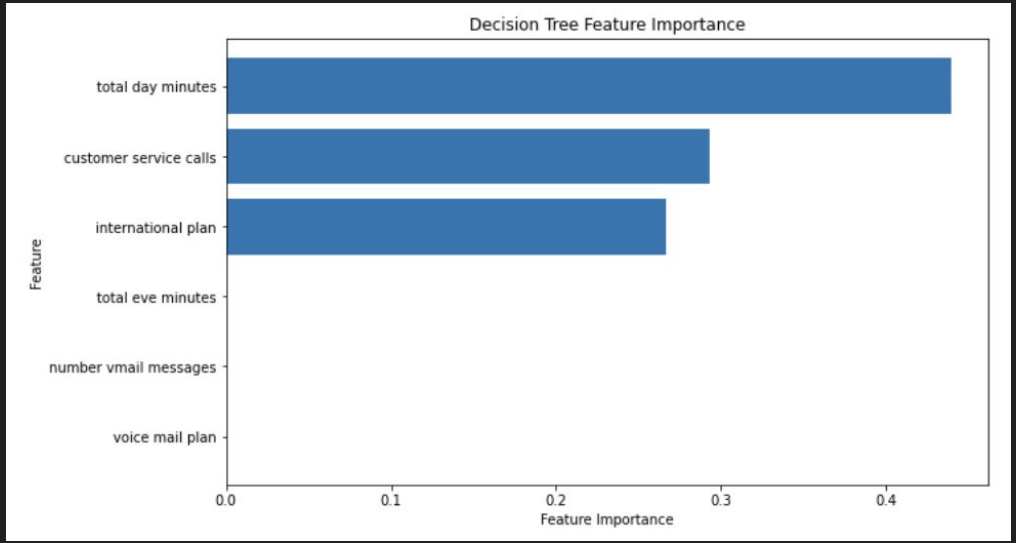
Precision: 0.35

Recall: 0.74

AUC: 0.75

Feature Importance from Decision tree

- Telecom companies should provide discounts for those who speak on the phone more
- Should consider unlimited phone plan / international phone plans for customers

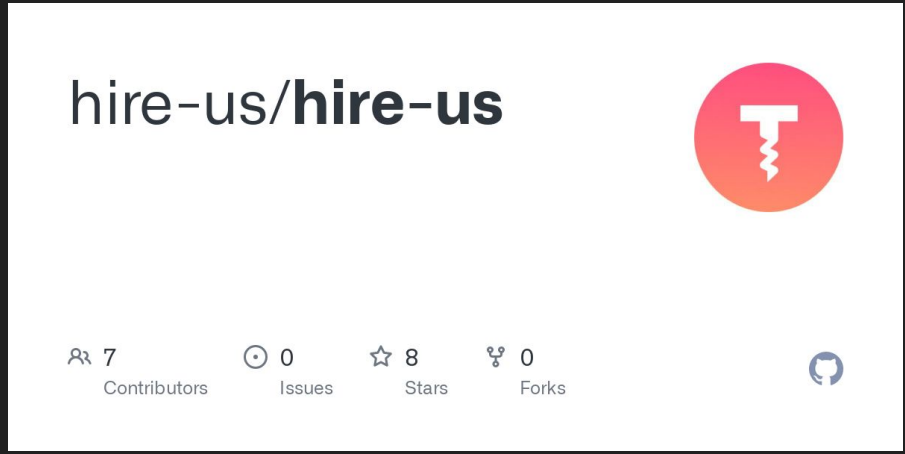


Recommendations & Next Steps

Decision tree is the best model found with an recall of 0.86.

Telecom companies are encouraged to hire Hammer Consulting for access to the model so they know which customers are at risk of churning.

Next steps: more data, more features, use of neural net model & random forest



Contact Information

Michael Hammer
Email: michaelhammerb@gmail.com
Github: https://github.com/michaelhammer1
LinkedIn: https://www.linkedin.com/in/michaelhammerb/