Customer Churn Prediction for SyriaTel

Using Machine Learning to Reduce Customer Loss

Business Problem

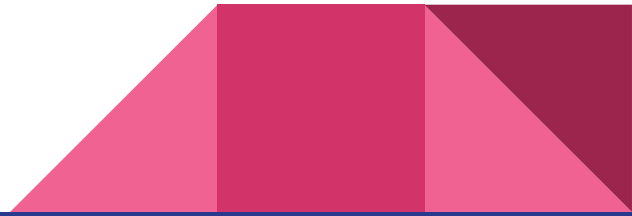
The SyriaTel company is losing customers through customer churn. The company would like to know if they are able to predict customers who are likely to leave.

The goal of this project is to develop a model that helps SyriaTel to predict which customers are likely to churn using the historical data. By identifying the potential churners early, SyriaTel is able to take action needed to ensure that they retain their clients.

Data Overview

- Has 3,333 rows and 21 columns ; rows are the customers and columns are the customer features.
- The churn colum is the one of interest to this project in boolean ie. True/False
- Data has no missing values
- Account length is the duration of the customer relationship
- International plan, voicemail plan are the categorical service flags
- Total day minutes, total intl calls, customer service calls are the customer Usage behavior
- State, and phone number: Likely not useful for prediction

Key Feature: Churn (Yes or No)



Data Preparation

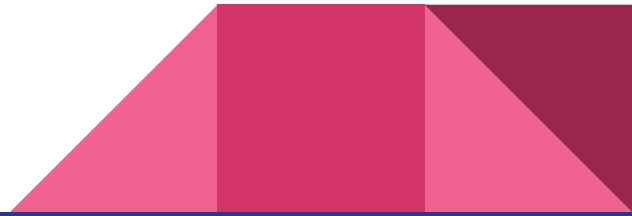
In this section we prepared the data for machine learning by:

- Dropping the irrelevant columns (state, phone number)
- Converting the categorical variables to numeric
- Separating the features and target variable
- Split data into training and testing sets (80/20)
- Scaling ensures that the feature values need to be standardized

Modeling

We tested with two models below and chose to use recall as the key metric:

- Logistic Regression
- Decision Tree



Evaluation

Decision Tree is clearly the stronger model.

Metric (Churn)	Logistic Regression	Decision Tree
Recall	0..18	0.73
Precision	0.60	0.73
F1-Score	0.27	0.73
Accuracy	0.86	0.73

Recommendations

- The recommendation is to use the Decision Tree model to flag high-risk customers i.e those predicted to churn
- Prioritize the metric recall to maximize the number of churners caught.
- Implement regular monitoring and retraining as customer behavior or offerings change.
- Apply retention strategies such as discounts, customer service follow-up and promotions to those high-risk customers.
- Additional data collection such as customer satisfaction surveys understand what to improve to ensure clients are retained.

Conclusion

Decision Tree is the best model to be able to flag potential churners and intervene early and reduce the churn.