Telecom User Churn Prediction using ML

Introduction

- The churn rate/customer churn, is the rate at which customers stop doing business with an entity.

- The churn rate of a company is a reflection on the quality of the service the business is providing.

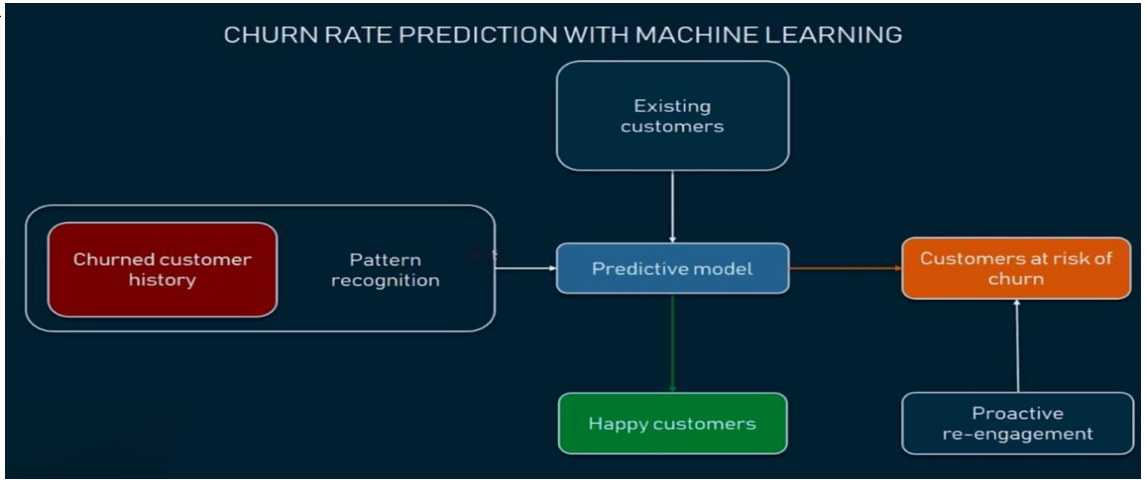
- In order to optimize the company performance & revenue, a good churn predictive model is required.

Customer Churn Prediction Model

- Telecom industry churn data set is integrated with ML framework.

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	...	DeviceProtection
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No	...	No
1	5575-GNVDE	Male	0	No	No	34	Yes	No	DSL	Yes	...	Yes
2	3668-QPYBK	Male	0	No	No	2	Yes	No	DSL	Yes	...	No
3	7795-CFOCW	Male	0	No	No	45	No	No phone service	DSL	Yes	...	Yes
4	9237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No	...	No

5 rows × 21 columns



- Writing an algorithm to award long run customers considering tenure.

Pipeline

- Pipeline is used to limit data pre-processing and fit-transform multiple times.

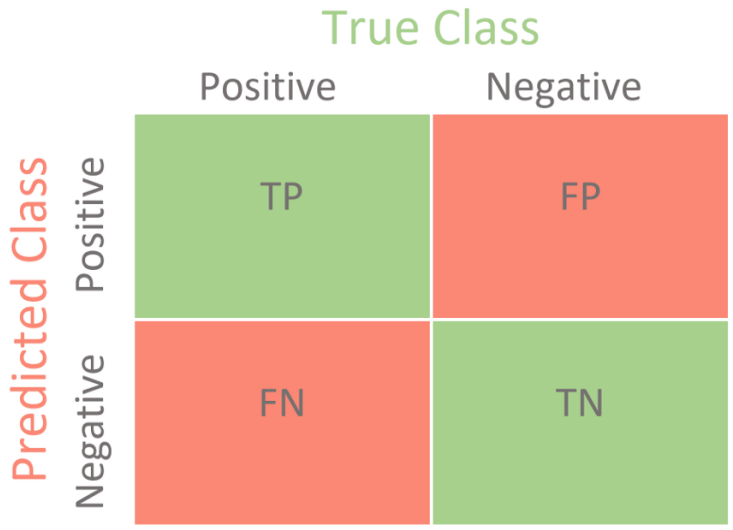
- Logistic Regression,XGBoost,ADBoost,Decision Tree,Random Forest and Support Vector machine are used.

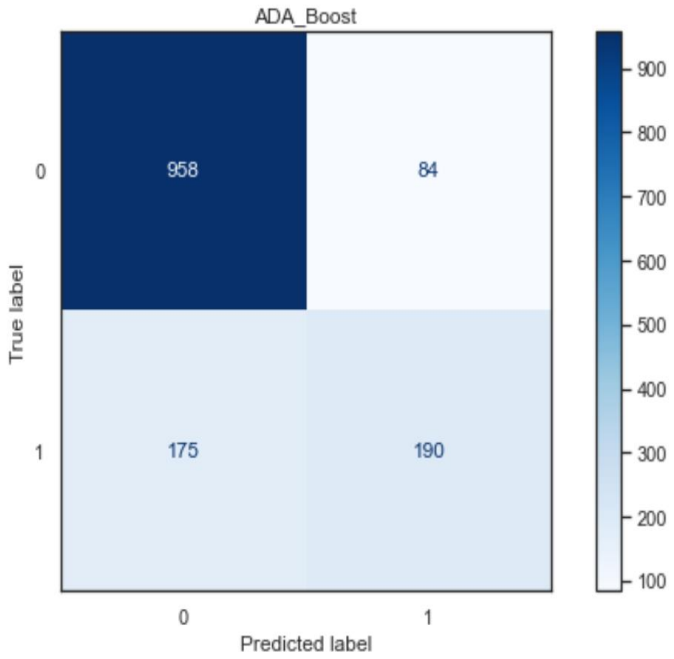
Cross Validation

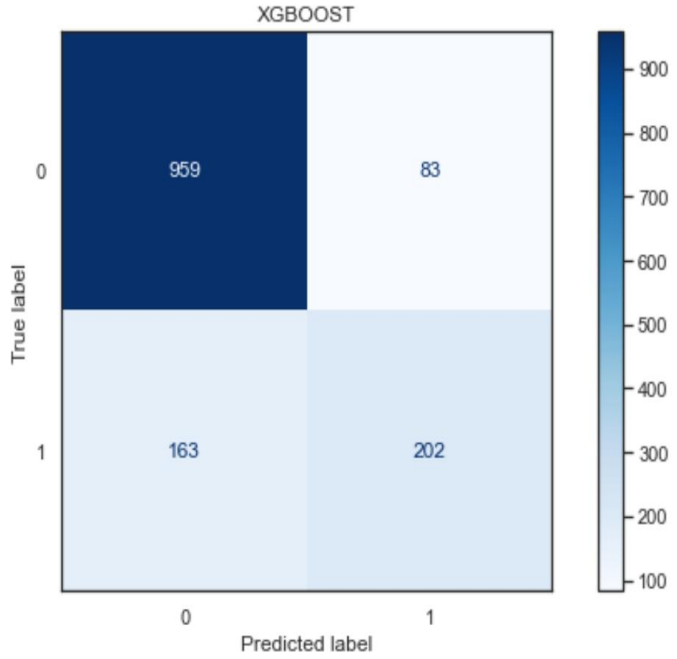
- To avoid overfitting we used stratified cross validation

Neural Networks and Confusion Matrix

- Keras Sequential Models are used with an epoch of 100
- We have used Adam to optimize learning rate







Model Testing & Accuracy

Model	Accuracy Score Obtained	Recall Score Obtained
Decision tree	73.91%	82.24%
Logistic Regression	82.1%	91.2%
Random Forest	79.77%	91.5%
XG Boost	82.51%	92.03%
ADA Boost	82.01%	91.9%
SVC	82.37%	91.45%
XG Boost with Hyper Parameter Tuning	80.50%	92.03%
Logistic Regression with Cross validation	82.50%	87.03%
Ensemble Learning using Max Voting	82.23%	91%
Neural Network Modeling	76%	87%

Predicting tenure and awarding long run customers

- Linear Regression is used to predict the tenure with 85% accuracy.
- Based on tenure predicted discount is given.
- If tenure is between 12 to 24 months we have given 10% and greater than 24 months we have given 15% discount.


Thank you!