TELECOM – CHURN CASE STUDY

INTRODUCTION

IN THE TELECOM INDUSTRY, CUSTOMERS ARE ABLE TO CHOOSE FROM MULTIPLE SERVICE PROVIDERS AND ACTIVELY SWITCH FROM ONE OPERATOR TO ANOTHER. IN THIS HIGHLY COMPETITIVE MARKET, THE TELECOMMUNICATIONS INDUSTRY EXPERIENCES AN AVERAGE OF 15-25% ANNUAL CHURN RATE. GIVEN THE FACT THAT IT COSTS 5-10 TIMES MORE TO ACQUIRE A NEW CUSTOMER THAN TO RETAIN AN EXISTING ONE, **CUSTOMER RETENTION** HAS NOW BECOME EVEN MORE IMPORTANT THAN CUSTOMER ACQUISITION.

FOR MANY INCUMBENT OPERATORS, *RETAINING HIGH PROFITABLE CUSTOMERS IS THE NUMBER ONE BUSINESS GOAL.*

TO REDUCE CUSTOMER CHURN, TELECOM COMPANIES NEED TO **PREDICT WHICH CUSTOMERS ARE AT HIGH RISK OF CHURN.**

PROJECT OBJECTIVE

- To predict customer churn

- Understanding customer behavior during churn

- EDA ,evaluate the accuracy and performance of the model
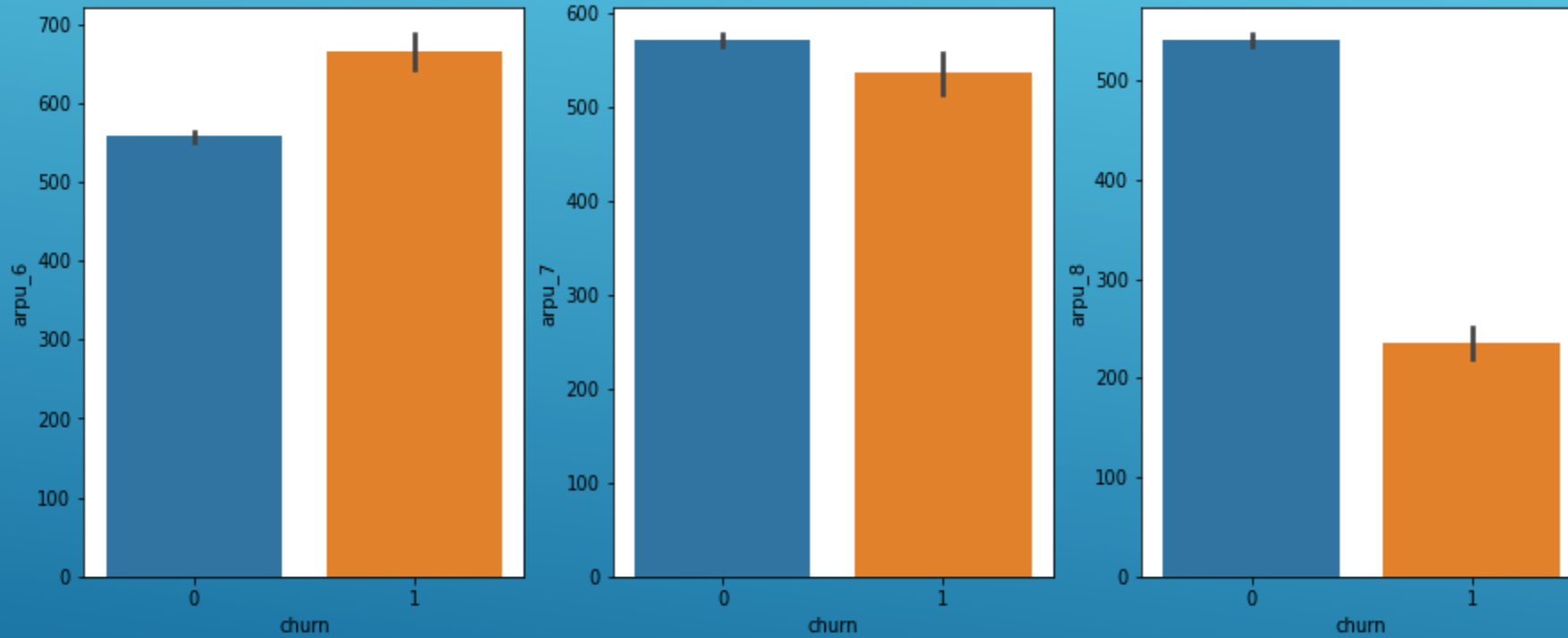
- summary

Steps and methods used

> IMPORTED REQUIRED LIBRARIES
> READING & UNDERSTANDING THE DATA
> HANDLING MISSING VALUES
> EXTRACTING HIGH VALUE CUSTOMERS
>EDA
> MODELLING
> LOGISTIC REGRESSION
> PRECISION AND RECALL TRADEOFF
> MAKING PREDICTIONS ON THE TEST SET
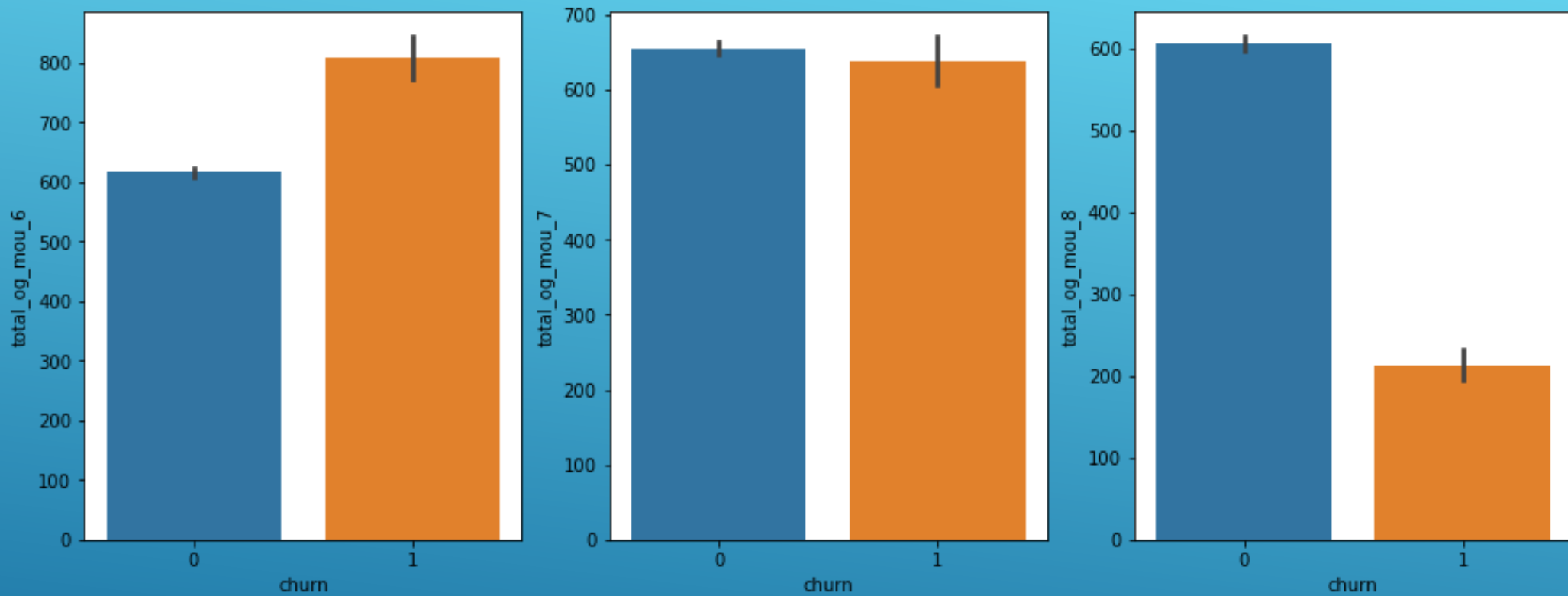> CONCLUSION

EDA
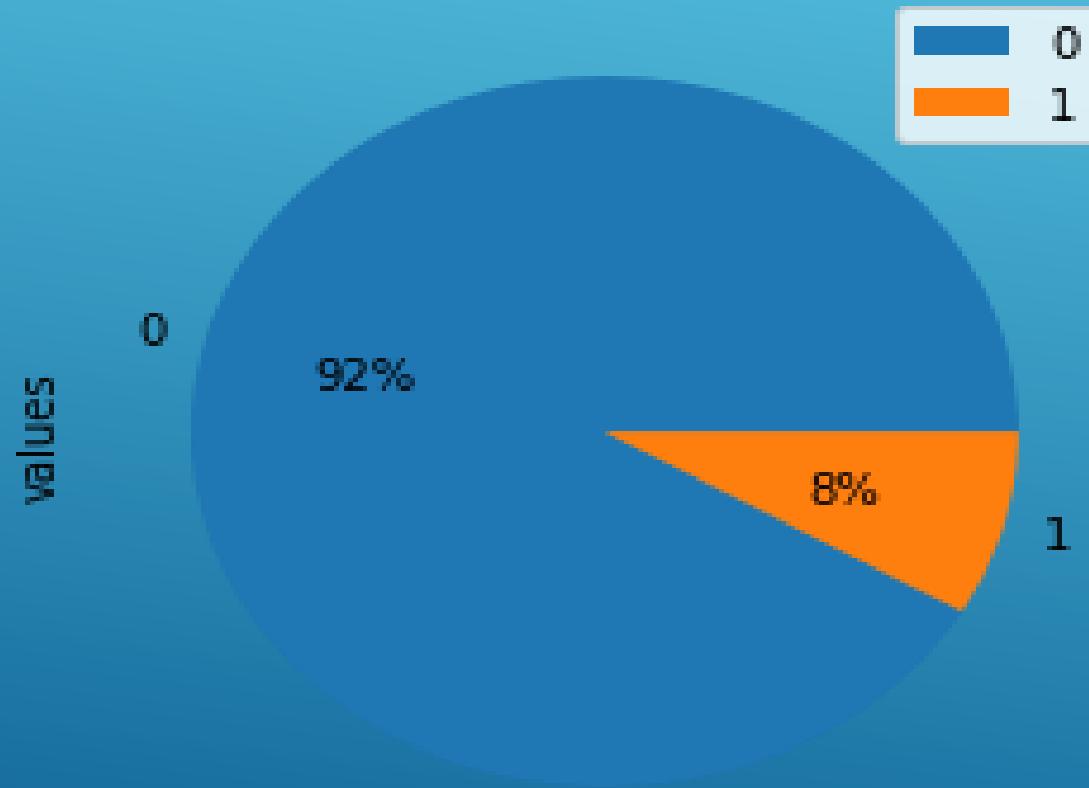
Churn is converted to 0 and 1
92% is of 0 value and 8% is 1

EDA

observation : arpu indicate average revenue per user from above graph we can see that average revenue per person decreases in 8th month because of number of churn customer increases.

OBSERVATION: TOTAL OUTGOING CALLS TIMING IN MINUTES IS DENOTED BY TOTAL_OG_MOU AS WE CAN OBSERVED FROM ABOVE GRAPH THAT NUMBER OF OUTGOING CALL MINUTES DROP IN 8TH MONTH IT INDICATES CHURN.
OBSERVATION : TOTAL INCOMING CALLS TIMING IN MINUTES IS DENOTED BY TOTAL_IC_MOU AS WE CAN OBSERVED FROM ABOVE GRAPH THAT NUMBER OF INCOMING CALL MINUTES DROP IN 8TH MONTH IT INDICATES CHURN.
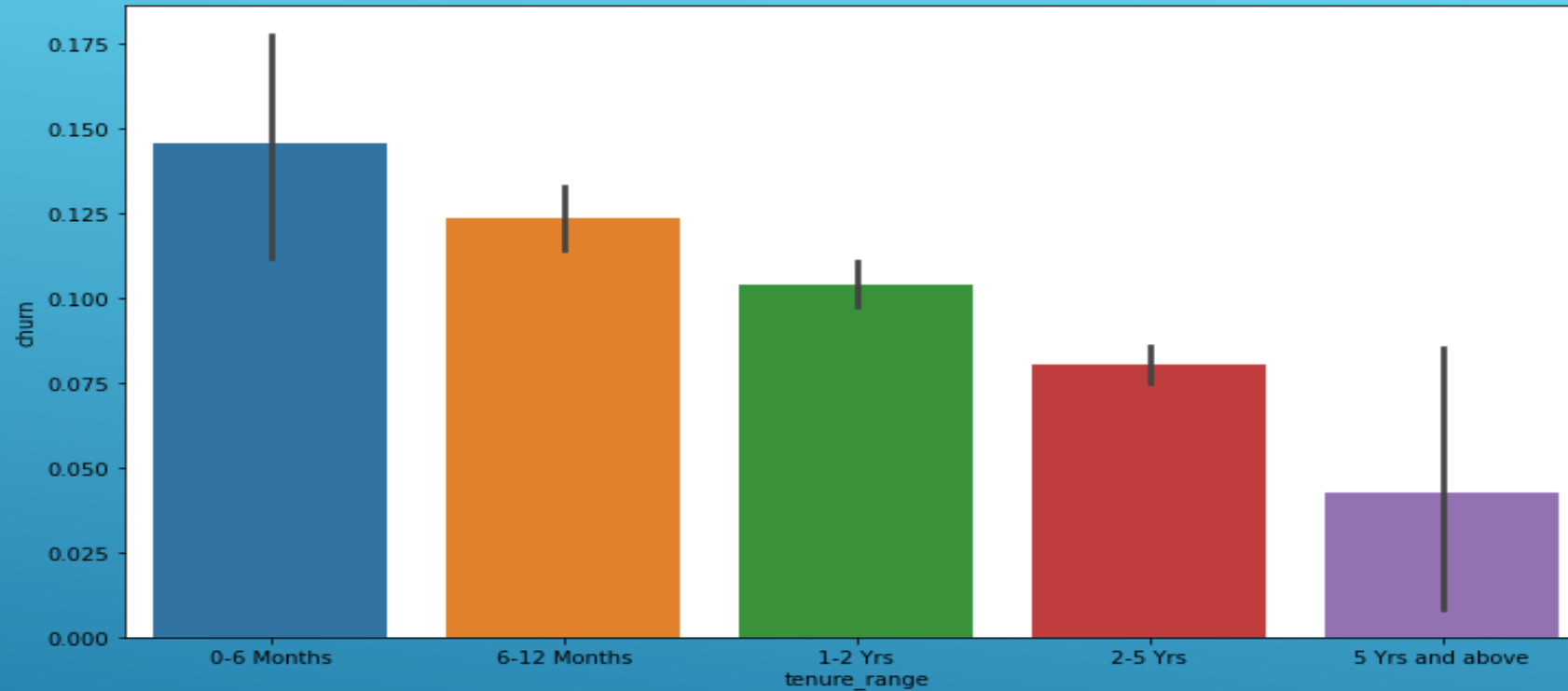
THE AVERAGE REVENUE PER USER IS GOOD PHASE OF CUSTOMER IS GIVEN BY ARPU_6 AND ARPU_7. SINCE WE HAVE TWO SEPERATE AVERAGES, LETS TAKE AN AVERAGE TO THESE TWO AND DROP THE OTHER COLUMNS.
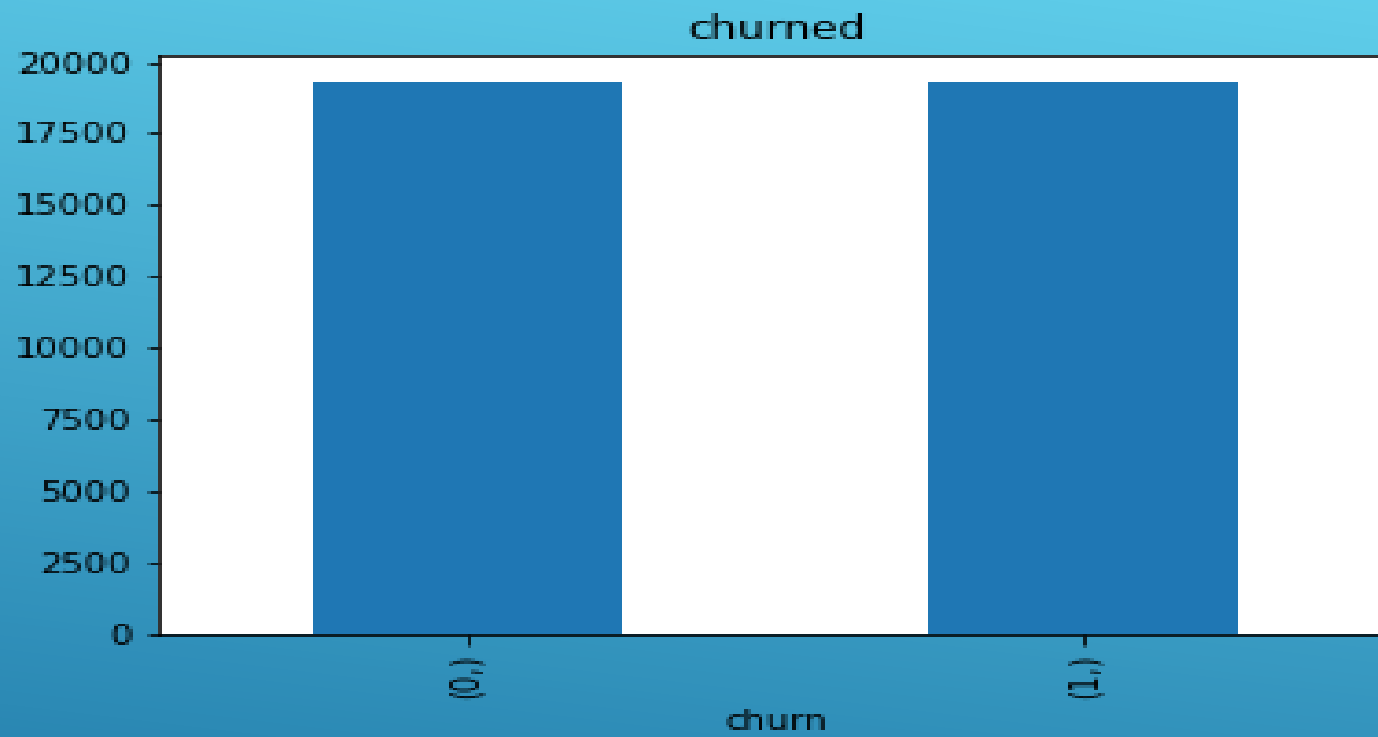
THROUGH SMOTE WE COPE UP THE CLASS IMBALANCE PROBLEM
VISUALIZING THE COUNTS OF UNIQUE ROWS IN THE Y_TRAIN_SM OF THE DATAFRAME

Logistic regression model using RFE method

The overall accuracy of the model is: 0.8096832814122533

```python
# Let's see the sensitivity of our Logistic regression model
print("Sensitivity = ",TP / float(TP+FN))

# Let us calculate specificity
print("Specificity = ",TN / float(TN+FP))

# Calculate false postive rate - predicting churn when customer does not have churned
print("False Positive Rate = ",FP/ float(TN+FP))

# positive predictive value
print ("Precision = ",TP / float(TP+FP))

# Negative predictive value
print ("True Negative Prediction Rate = ",TN / float(TN+ FN))
```
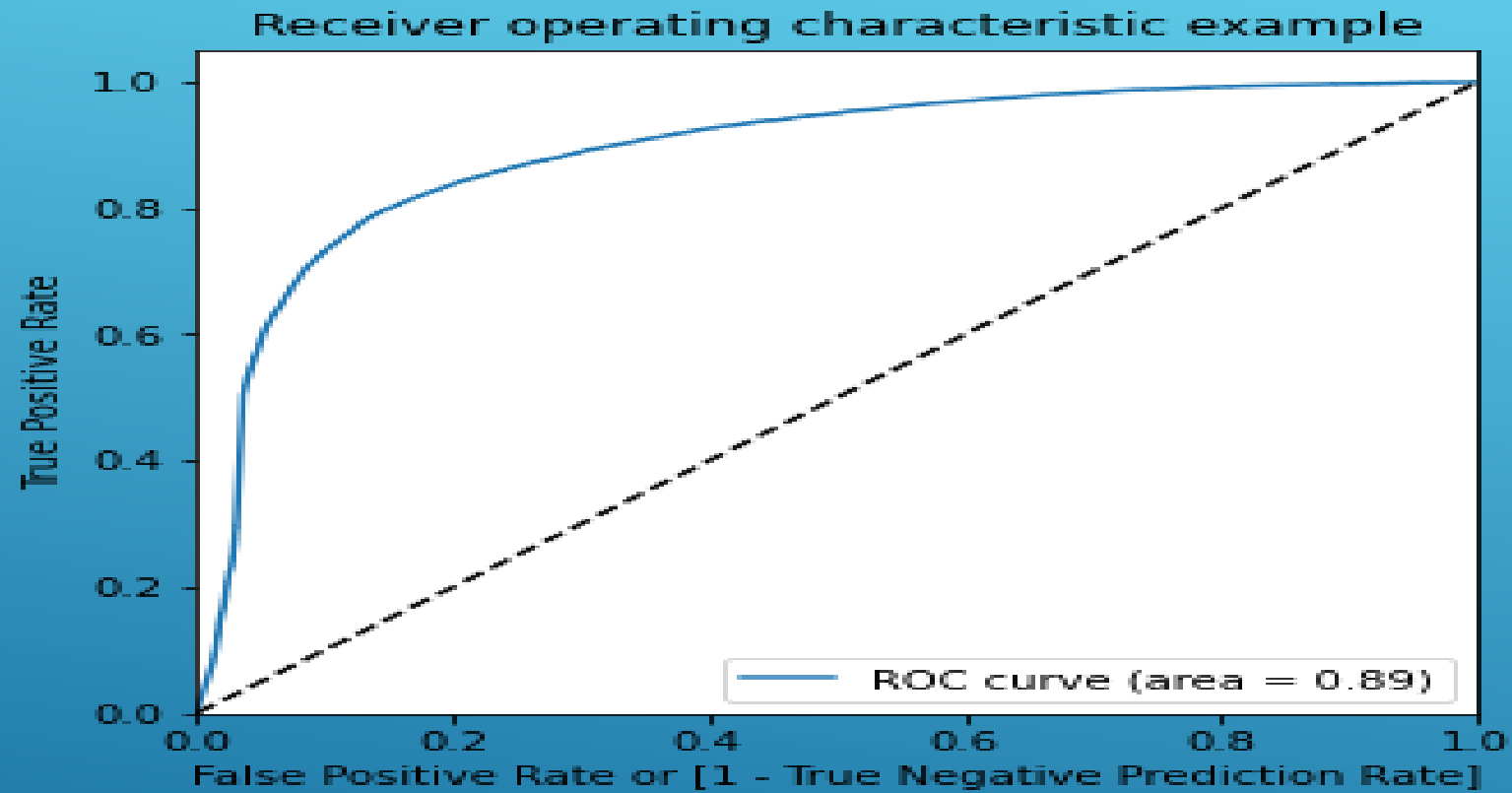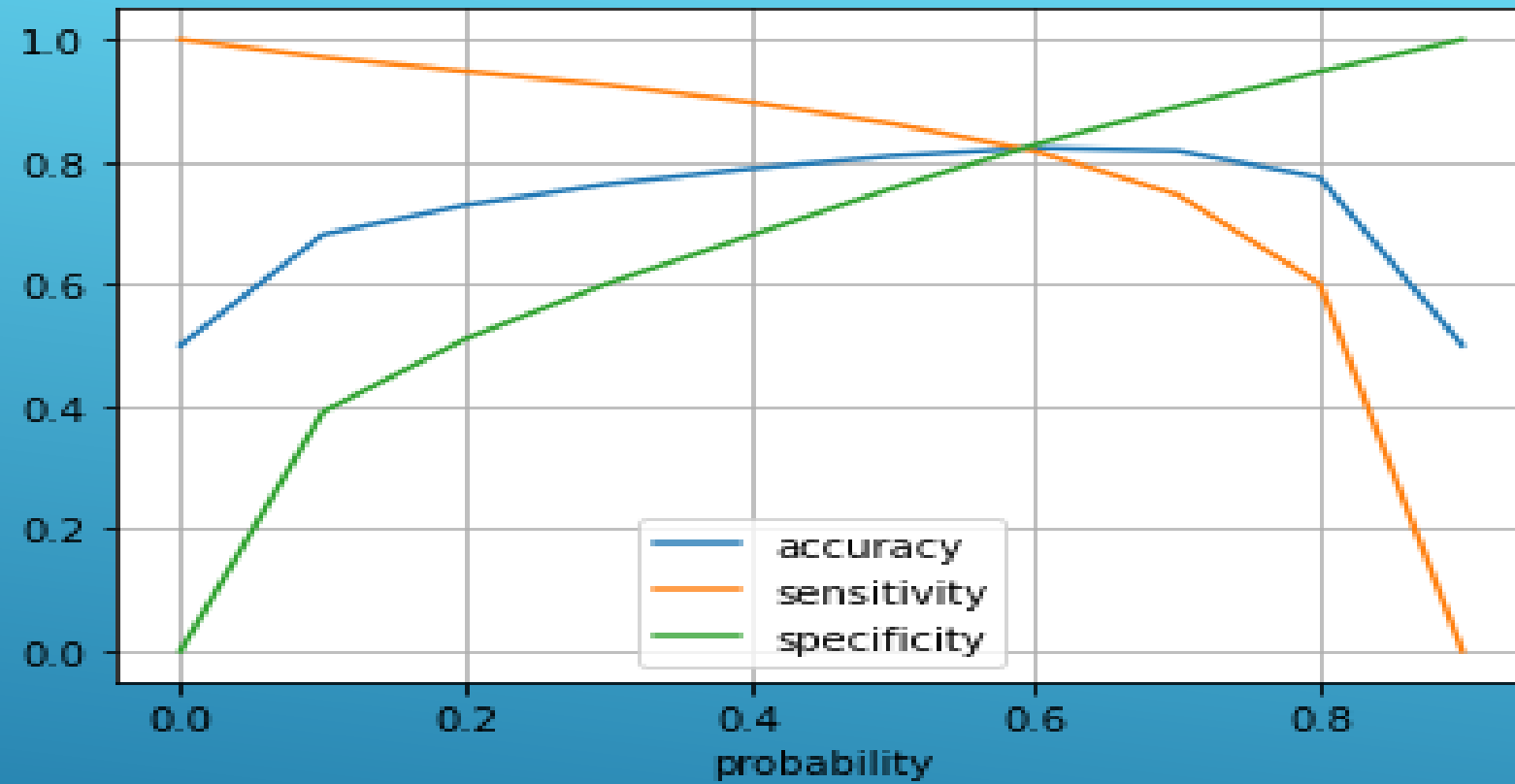
```
Sensitivity =   0.8624091381100727
Specificity =   0.7569574247144341
False Positive Rate =   0.24304257528556594
Precision =   0.7801418439716312
True Negative Prediction Rate =   0.8461895641070288
```

Plotting the curve for the obtained metrics

Plotting accuracy sensitivity and specificity for various probabilities

▶ The overall accuracy of the model now is: 0.815965732087274

```
Sensitivity =  0.84646936656628245
Specificity =  0.7854620976116303
False Positive Rate =  0.21453790238836967
Precision =  0.79779789576770663
True Negative Prediction Rate =  0.8364943323196019
```

Receiver operating characteristic example
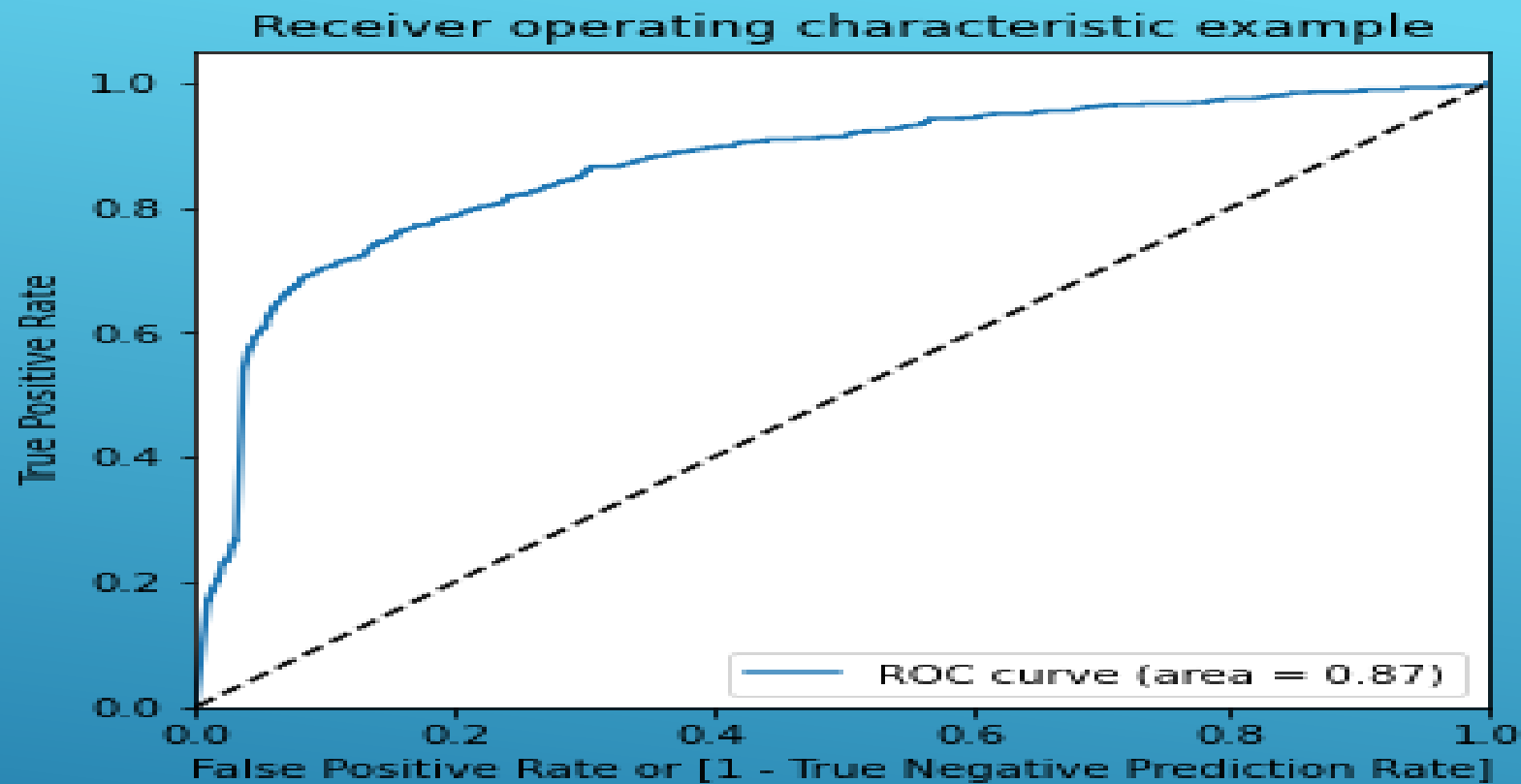
ROC curve for the test DataFrame
The accuracy of the predicted model is: 80.9 %
The sensitivity of the predicted model is: 84.6 %

As the model created is based on a sensitivity of the model, i.e. the True positive rate is given more importance as the actual and prediction of churn by a customer

Conclusion

➢ The Importance of the case study is to help the telecom industry make more profit

➢ It has become known that predicting churn is one of the most important sources of income to Telecom companies

➢ Hence this case study aimed to build a system that predict the churn of customers in Telecom company

➢ To reduce the customer churn companies has to follow best practices such as analysis of churn when it happens, stay competitive, define roadmap for the new customers, offer discounts etc