

# **Telecom Churn Case Study**

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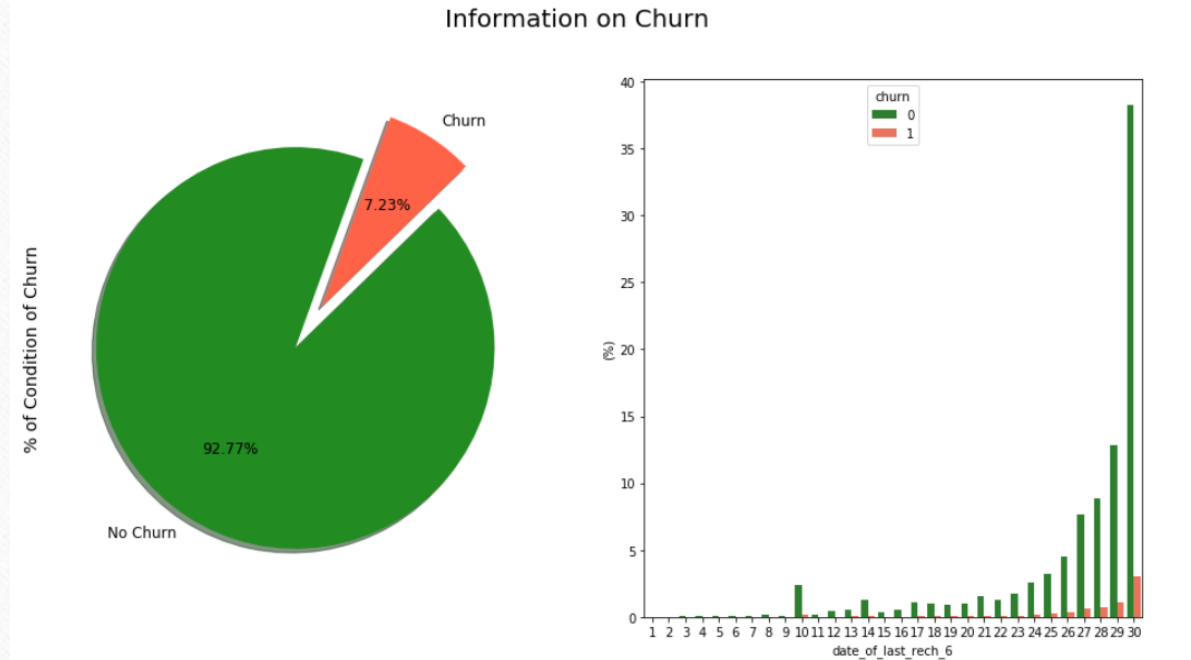
# Data Understanding

- Data Description:

- Total unique customers: 99999
- Variables: 226
- Missing Values: 40 (having > 50% NaN)
- No of high value customers: 29906

- Churn

- 2418 are tagged as churned from high value customers
- Non churners have majority of 91.91%.





# Model Building

- Before handling imbalance -

Before handling the imbalance, counts of label '1': 1483  
Before handling the imbalance, counts of label '0': 18983  
Before handling the imbalance, churn event rate : 7.25%

- After handling the imbalance –

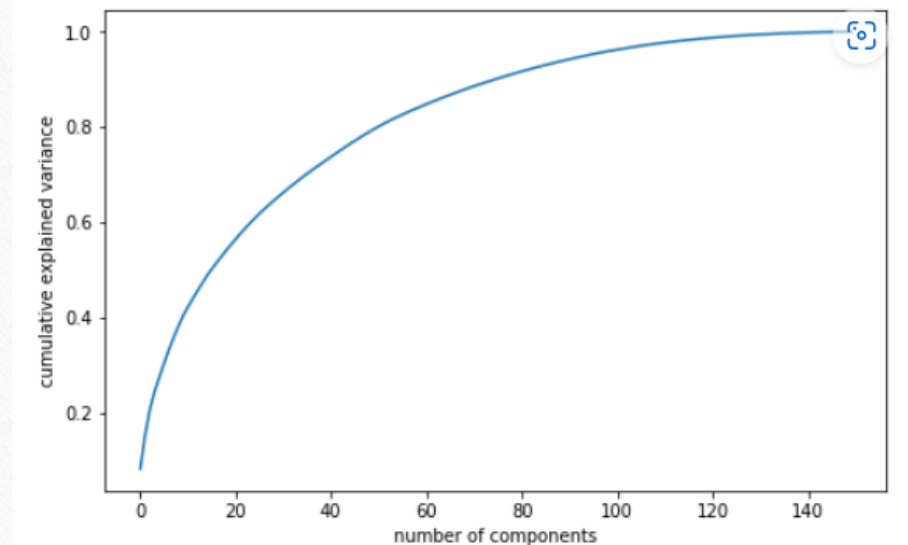
After handling the imbalance, counts of label '1': 18983  
After handling the imbalance, counts of label '0': 18983  
After handling the imbalance, churn event rate : 50.0%

- PCA:

- It can be observed that 80 components account for 90 % of the variance.
- Considering large data incremental PCA is the model used

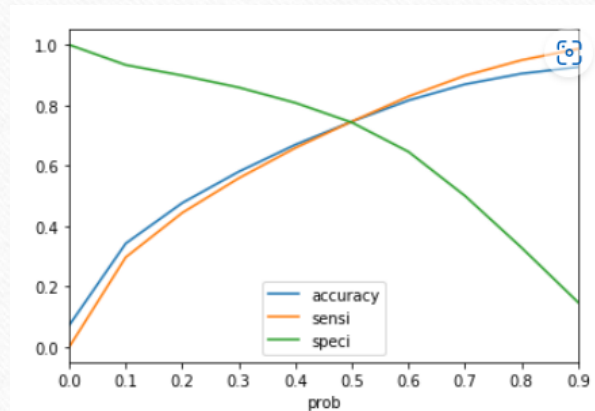
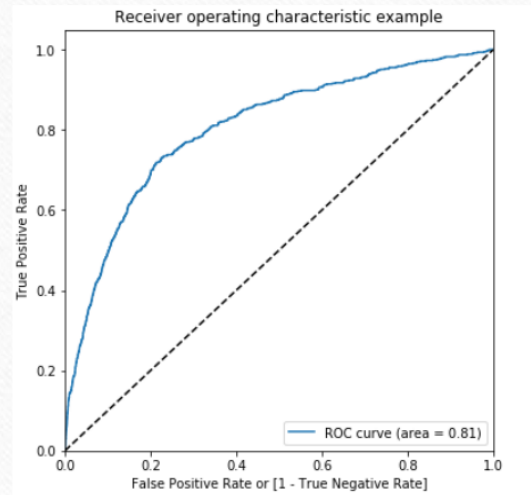
max corr: 0.030100989713797453 , min corr: -0.015885137158070103

- As can be seen, there is almost no link between the two components.
- Our data was successfully cleaned of multicollinearity, and as a result, our models will be significantly more reliable



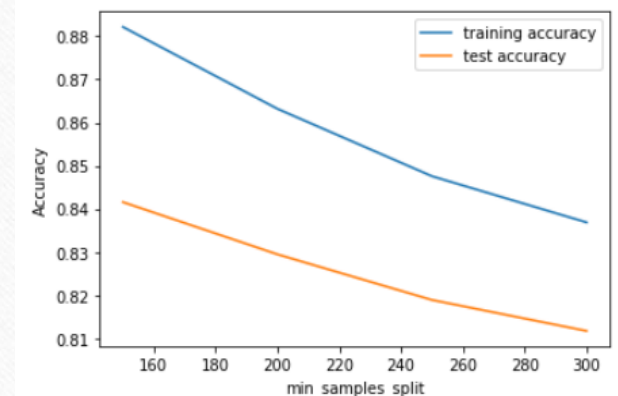
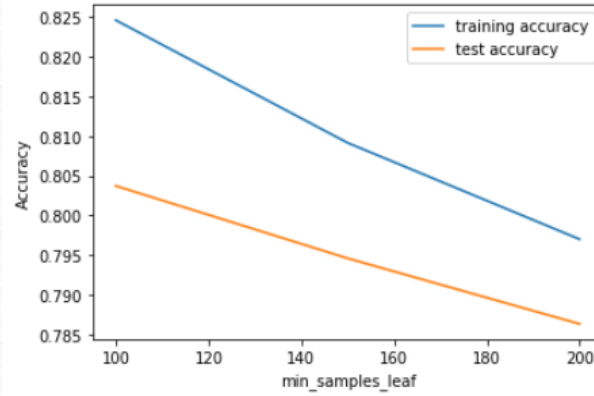
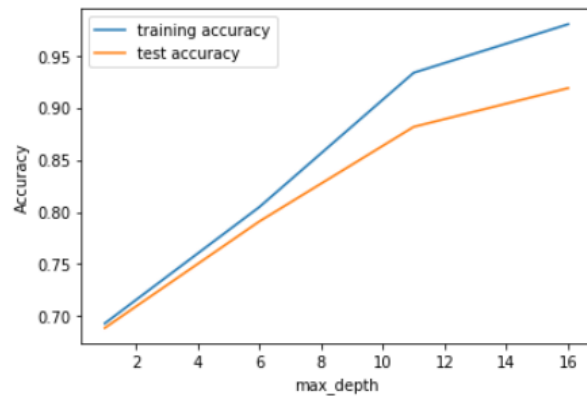
# Logistic Regression

- Logistic Regression Model:
- Logistic regression model has been chosen considering churn is a classification data
- ROC curve:
  - Area under ROC curve is 0.81 which is closer to one which shows the model is better performing model when it comes to classification.



# Random Forest

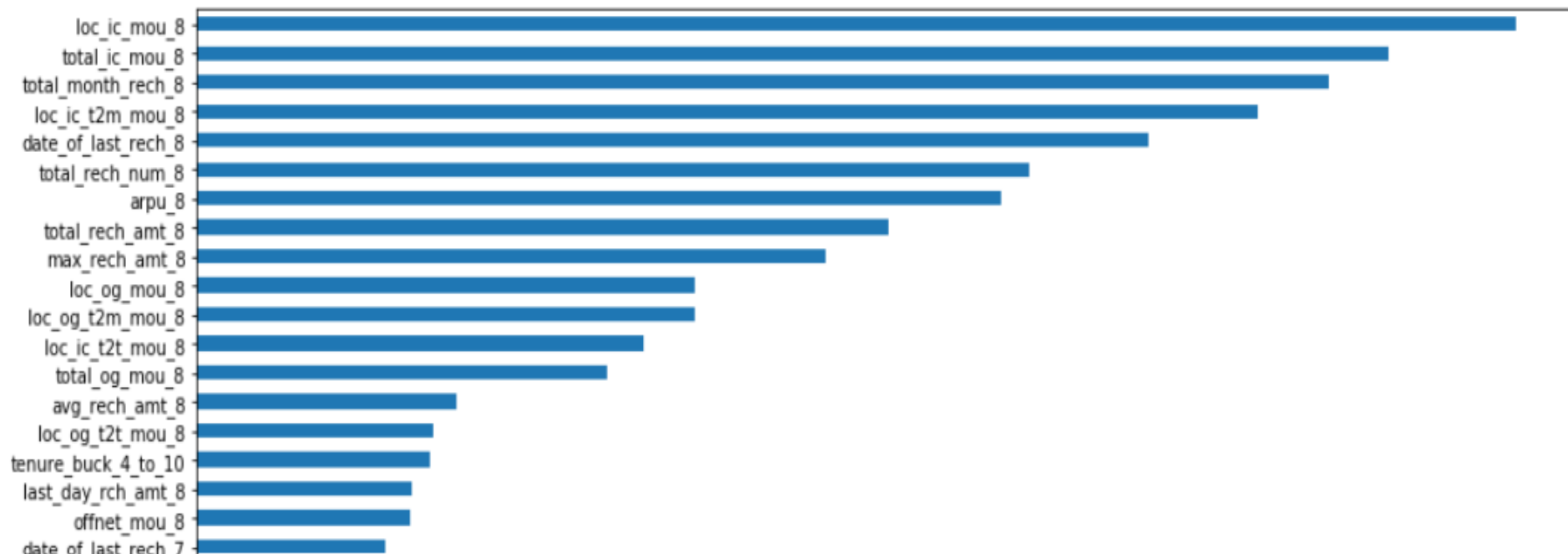
- Random Forest:
- Hyperparameter tuning



- The results of the customer churn analysis showed that Logistic Regression outperformed Decision Tree. As Logistic Regression has a higher sensitivity and better specificity score, we may be able to predict prospective client attrition.



# Recommendations



- Top characteristics are those that are predominantly associated with month 8, or the action phase, as determined by our Random Forest implementation.
- Providing discounts and additional service packs during this phase to customers would help in retaining.

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Thank You