

Telecommunication Company Churn Prediction

Predict the Churn of Users

Presented by: **Ikhwanul Muslimin**





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final project



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Churn Prediction

Telecommunication company - Predict the churn of users.

Executive Summary



Business Background

PT XYZ is a telecommunications company that currently has approximately **6000 customers** with several services provided such as **telephone services, internet services, and other complementary services.**



Problem Statements

In the past month, **PT XYZ's profit has decreased** because there are **27.7% of customers who churn** from the services provided without providing feedback on why they churn.



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Objective

- To predict the customer churn.
- To recommend a fit strategy to prevent churn and maintain the loyalty.
- To evaluate the result from customer churn prediction



Result

Analysis results:

- **Senior customers** have a much higher churn rate against for non-senior customers.
- Customers that doesn't have **partners** or **dependents** are more likely to churn.
- Customers with **fiber** are more probable to churn than those with DSL connection.
- **Short term contracts** have higher churn rates.

ML result: The evaluation using Logistic Regression showed **0.8462 ROC AUC** score and **80.64% accuracy** in the prediction model.



Proposed Solutions


Use **machine learning (ML)** to predict which customers have the potential to churn and which do not. Then, **provide special treatment** for each of these groups with the aim of minimizing customer churn.




Business Benefit

- It solved the problem of decreasing the profit.
- It helped PT XYZ to determine early thread of churn.
- It can prevent up to **799 of 1587** churned customers from churn.
- It can apply the marketing strategy that fit with each customer pattern of buying.

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Churn Prediction

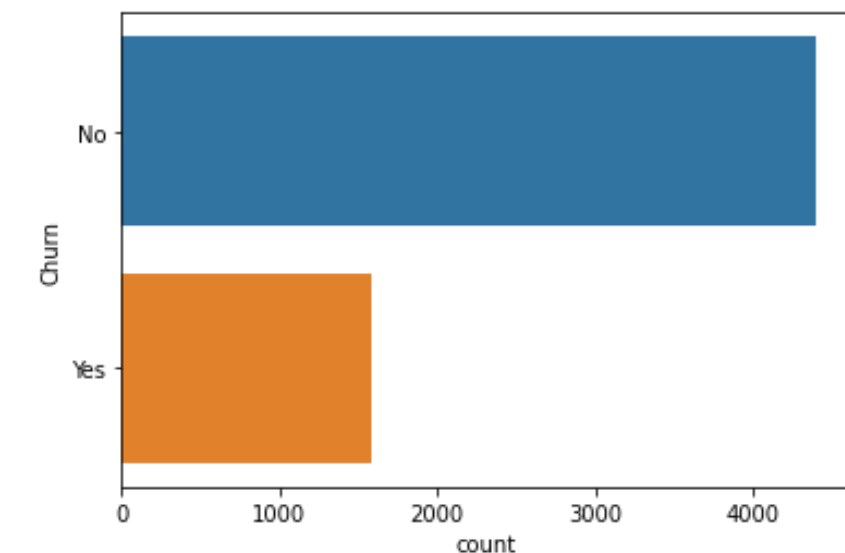
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Exploratory Data Analysis (EDA)

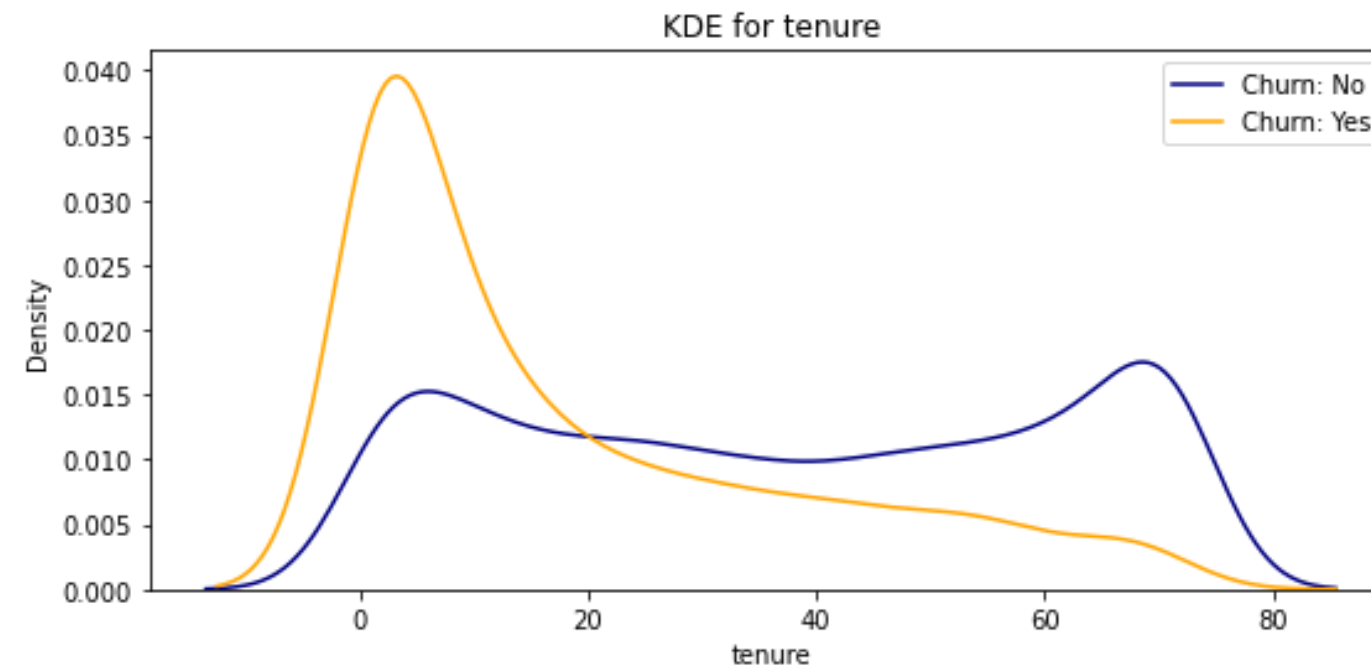
➔ From the **feature importance**...

- Recent clients are more likely to churn

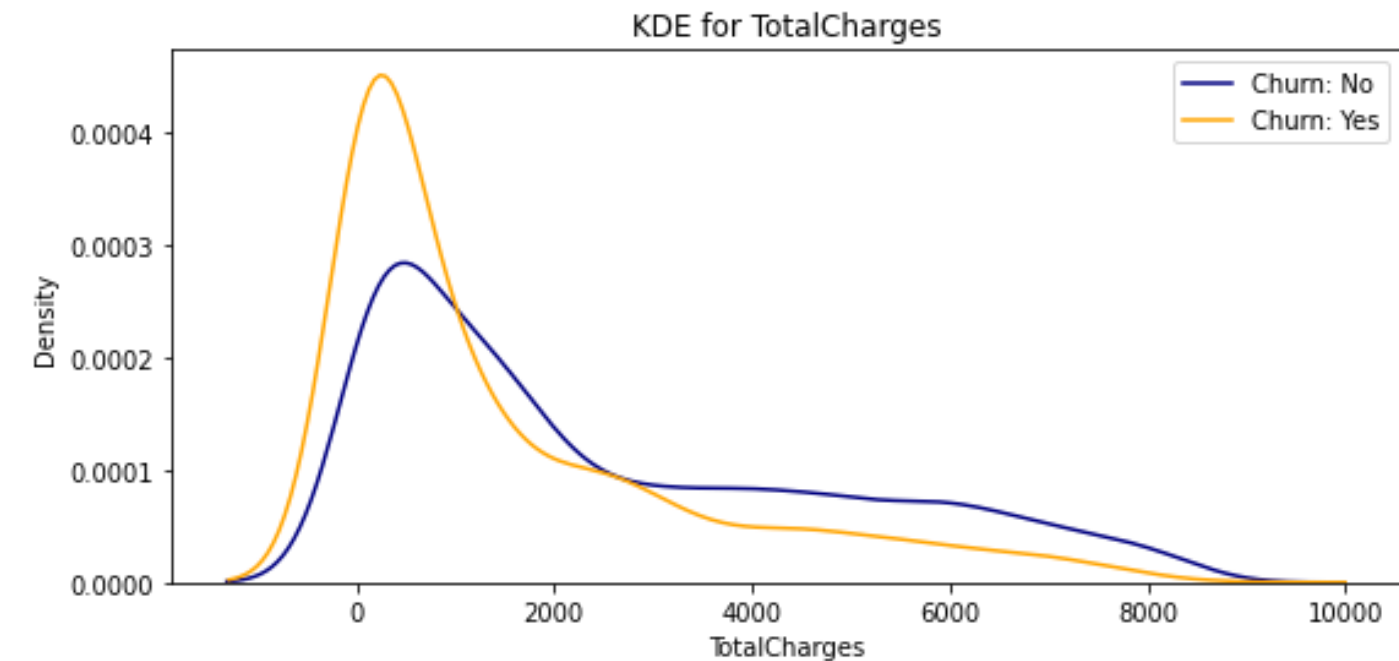
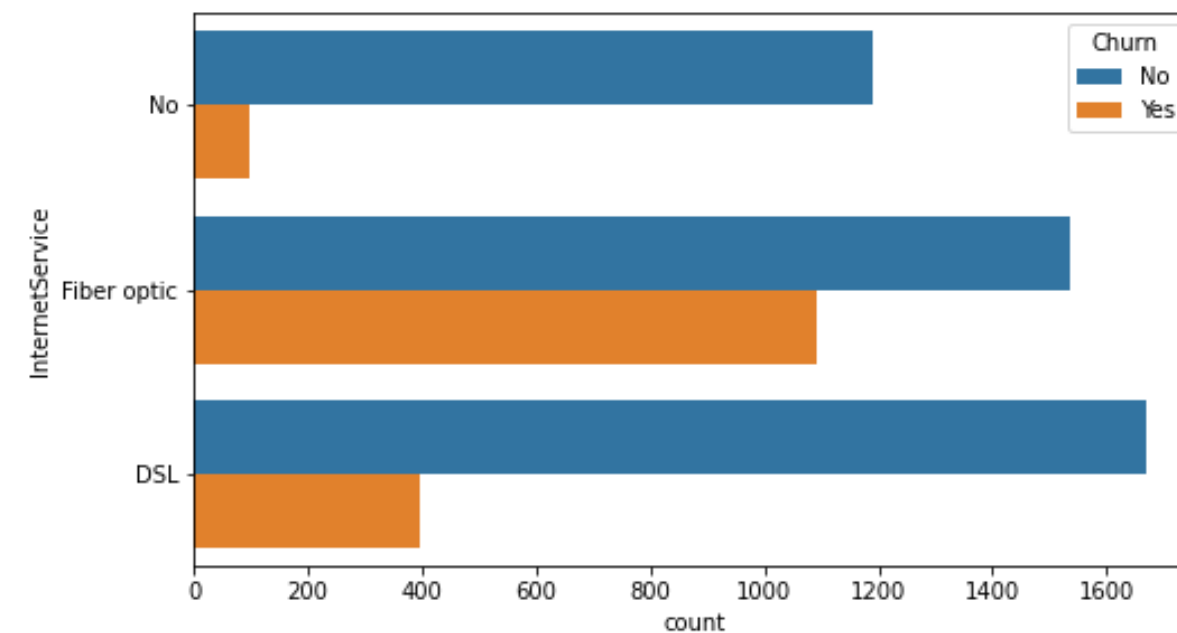
Our data is **imbalance**...
with < 1% missing data.



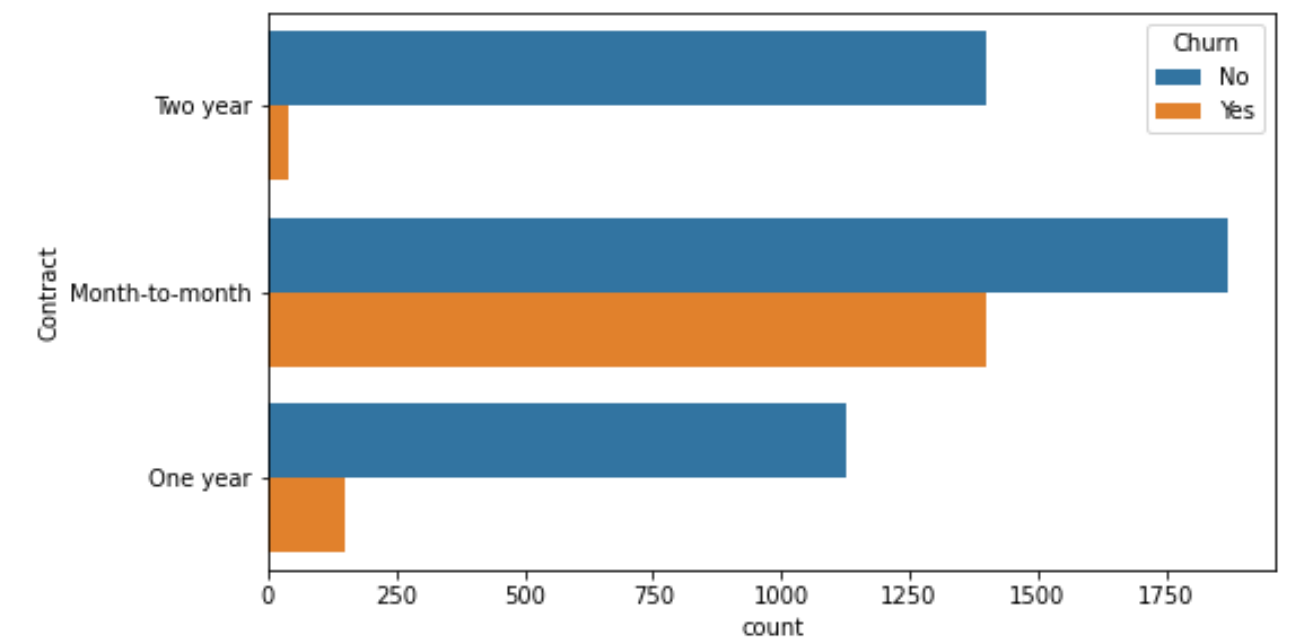
so, we should use ROC AUC score instead of accuracy.



- Clients without internet have a very low churn rate
- Customers with fiber are more probable to churn than those with DSL connection



- Short term contracts have higher churn rates



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Modelling

Select Modelling Technique (Cross-Validation)

Logistic Regression

- ROC AUC: 0.8417
- Accuracy: 0.8045

Support Vector Machine - RBF

- ROC AUC: 0.8312
- Accuracy: 0.7550

K-Nearest Neighbors

- ROC AUC: 0.8285
- Accuracy: 0.7957

Feature Engineering: Remove Useless Columns

Dropping:

'gender', 'No internet service',
'PhoneService'

- ROC AUC: 0.8417
- Accuracy: 0.8045

Feature Engineering: Add New Columns

charges difference

- ROC AUC: 0.8417
- Accuracy: 0.8045

tenure*charges

- ROC AUC: 0.8417
- Accuracy: 0.8047

charges ratio

- ROC AUC: 0.7203
- Accuracy: 0.7227

Feature Engineering: Polynomial Features

Degree: 2

- ROC AUC: 0.8444
- Accuracy: 0.8097

Degree: 4

- ROC AUC: 0.8459
- Accuracy: 0.8068

Degree: 3

- ROC AUC: 0.8462
- Accuracy: 0.8064

Degree: 5

- ROC AUC: 0.8446
- Accuracy: 0.8068

RESULTS

So, by doing feature engineering, we can improve the following metrics:

ROC AUC

- Before: 0.8417
- After: 0.8462

Accuracy

- Before: 0.8045
- After: 0.8064



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Action and Recommendation

Potential to Churn:

- Notify periodically any promotional that are currently available.
- Offer member programs to make them loyal

Churn:

- Give special discounts targeted at churn customers but within a certain period.
- Notify periodically any promotional that are currently available.
- Offer member programs to make them loyal.

Loyal:

- Keep up with what they need, provide information about promos regularly to keep them loyal.
- Implementing a member tier system such as silver, gold and platinum, each grade has a different benefit.





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Thank You!





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