**Predicting Customer Churn with Machine Learning**

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Customer churn or customer attrition happens when the customers stop using the product or service of a business. It directly affects the company profitability. The success rate of selling to an existing customer is usually higher than the success rate of selling to a new customer. Also, it is estimated that acquiring a new customer can cost five times more than retaining an existing one. So, customer churn analysis is essential for any business or industry including banking. Customer churn prediction is one of the challenging issues, but it helps the business to identify the problems. Weather it is the poor quality product/service or wrong target market.

The goal of this project is to predict customer churn for a bank. In this dataset (churn\_modeling.csv), we look at the "Exited" column to see if that customer is churned or not. We use the features such as Credit Score, Gender, Age, Tenure, Number of Products and … to predict customer churn.

The dataset has 10,000 records and 13 columns (excluding row number), combination of numerical and non-numerical features. Fortunately, it doesn’t contain missing entries.

We will initially perform EDA analysis and Data Pre-processing to identify and visualise the features contributing to customer churn. It’s a classification task and we will use ML classifiers such as Logistic Regression, Random Forests, SVM and maybe other algorithms to compare the prediction performance.

The bank in this study has been gathering customer data for a while to identify potential churners. With analysing those customers who have already left the bank, we identify if they have some shared feature or behaviour patterns. Bank needs to identify customers at risk of churn before it is too late to take appropriate actions and optimize their strategic plans. Machine learning algorithms can help us here to resolve the below problems:

* Having the up-to-date list of potential churners, would greatly help sales and marketing to engage with customers differently. For example, customers who are currently at churn risk are not the good candidates to target in marketing campaigns to buy new products. When customers have already showed signs of churn, it is not a great time for sales department as well to reach out about additional services. Non-churn risk customers are probably better candidates to target at launching new service or product.
* Customer service management can use this study result to take appropriate actions, reach potential churners and understand their issues or pain points and gain back their trust. Customer satisfaction/success managers need this insight to know which customers they should contact. Successful customer interaction and retention strategy is related to speaking with the right customers at the right time.
* Identifying the features that contribute the most in customer churning help them address the specific and common issues the potential churners with those features might have. Implementing these insights is the opportunity to improve the product or service for growth and to reduce customer churn.

Dataset References:

<https://www.kaggle.com/datasets/adammaus/predicting-churn-for-bank-customers>