

Project title:

Predicting Bank Customer Churn

Goal of the project:

The primary goal of this project is to develop a robust and accurate predictive model that can classify bank customers based on their likelihood of churning that is, exiting or leaving the bank. Customer churn is a significant issue for financial institutions, as it directly impacts revenue, customer base stability, and long-term business growth. Retaining existing customers is generally far more cost-effective than acquiring new ones, making churn prediction a highly valuable tool for strategic decision-making.

By analyzing customer data such as age, credit score, account balance, and product usage, the project aims to uncover patterns and risk factors associated with churn. Multiple classification models will be used such as Logistic Regression, Decision Tree, Random Forest, SVM, KNN, and XGBoost to identify the most accurate approach for churn prediction.

This model can help the bank:

- Understand key reasons behind customer churn.
- Develop targeted strategies for customer retention.
- Improve overall customer satisfaction and reduce financial loss.

Data Set

We will use the **Bank Customer Churn Prediction Dataset** from Kaggle, which includes 10,000 customer records with features such as credit score, geography, gender, age, balance, tenure, number of products, credit card ownership, activity level, and estimated salary. The target variable, **'Exited'**, indicates whether the customer has left the bank.

The project methodology will include:

1. Exploratory Data Analysis (EDA) – to understand patterns and relationships in the data.
2. Preprocessing – handling missing values, encoding categorical data, and scaling features.
3. Model Training – applying classification models like Logistic Regression, Decision Tree, Random Forest, KNN, SVM, Gradient Boost, and XGBoost.
4. Model Tuning – optimizing performance through hyperparameter tuning.
5. Evaluation – comparing models using accuracy, precision, recall, F1-score, and ROC-AUC.
6. Insights – identifying key factors that influence churn and offering actionable business recommendations.