**Customer Churn Prediction: Project Summary**

**1. Project Overview**

This project focuses on predicting customer churn for a bank, facilitating proactive retention strategies. By analyzing customer demographics, behaviors, and financial data, the solution aims to identify at-risk customers and recommend targeted interventions to minimize churn rates.

**2. Business Context**

* Problem: High customer churn results in significant revenue losses and increased customer acquisition costs.
* Opportunity: Accurate churn predictions enable personalized retention strategies, improving customer loyalty and reducing operational costs.

**3. Solution Goals**

1. Accurately identify customers at risk of churning.
2. Provide actionable insights for targeted retention efforts.
3. Optimize retention costs by focusing on high-priority customers.

**4. Stakeholders**

* Business Managers: Utilize insights for strategic decision-making.
* Marketing Team: Develop and execute tailored retention campaigns based on predictions.

**5. Dataset Overview**

* **Key Features:**
  + ***Demographics:*** Geography, Gender, Age.
  + ***Behavioral Attributes:*** Tenure, NumOfProducts, HasCrCard, IsActiveMember.
  + ***Financial Metrics:*** CreditScore, Balance, EstimatedSalary.
* **Target Variable: Exited (Churn: Yes/No).**
* **Preprocessing Steps:** Applied scaling and encoding techniques to ensure data quality and compatibility for model training.

**6. Technical Solution**

* Models Evaluated: Logistic Regression, Decision Tree, SVM, Random Forest, Gradient Boosting, and XGBoost.
* Model Selection Criteria: Accuracy and F1-score were used to select the best-performing model.
* Output: Churn prediction (Yes/No) provided for individual customers or in bulk for larger datasets.

**7. Expected Outcomes**

1. Reduction in customer churn rates by proactively addressing risks.
2. Enhanced customer loyalty through data-driven engagement strategies.
3. Optimized retention costs by prioritizing critical customer segments.
4. Long-term business growth through improved customer retention strategies.