# 🏦 Bank Credit Card Launch - Data Science Project

This project focuses on helping a bank successfully launch a new credit card by leveraging data science and machine learning techniques. The goal is to identify potential customers, segment them effectively, and optimize the marketing strategy for maximum adoption.

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## 📌 Problem Statement

The bank wants to launch a new credit card and needs data-driven insights to determine:

- Which customers are likely to accept the new credit card offer.

- What factors influence their decision.

- How to segment customers for personalized marketing.

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## 💼 Business Objectives

- Increase credit card adoption rate.

- Reduce marketing cost by targeting the right customers.

- Understand key factors that drive customer conversion.

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## 📊 Dataset

- The dataset consists of customer demographics, account information, and whether they accepted a previous credit card offer.

- Features include: Age, Income, Tenure, Balance, Number of Products, Credit Score, and more.

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## 🔍 Exploratory Data Analysis (EDA)

- Handled missing values, outliers, and categorical variables.

- Identified trends such as higher acceptance among high-income and long-tenure customers.

- Correlation matrix and visualizations helped uncover significant predictors.

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## 🧠 Machine Learning Models

Applied and evaluated multiple models:

- \*\*Logistic Regression\*\*

- \*\*Random Forest\*\*

- \*\*XGBoost\*\*

- \*\*Support Vector Machine\*\*

Evaluation Metrics:

- Accuracy

- Precision

- Recall

- F1-Score

- ROC-AUC

\*\*Best Model:\*\* Random Forest achieved the highest ROC-AUC and overall balance in metrics.

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## 🔧 Tools and Technologies

- Python (Pandas, NumPy, Scikit-learn, XGBoost, Matplotlib, Seaborn)

- Jupyter Notebook

- Streamlit (optional for UI)

- Git & GitHub

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## 📈 Results and Recommendations

- Developed a predictive model to identify likely adopters with over 85% accuracy.

- Provided a ranked list of customers for targeted marketing.

- Suggested focusing on high-income, long-tenure customers with low balance and high credit score.

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## 🚀 Future Work

- Deploy model with a web dashboard using Streamlit or Flask.

- Perform A/B testing on marketing campaigns.

- Include real-time customer behavior data for better personalization.

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