# Customer Churn Prediction Project

## 1. Overview

This project aims to predict customer churn using machine learning models. By analyzing a dataset with customer demographics, service usage, and account info, we identify which customers are likely to discontinue service.

## 2. Techniques Used

- Data Preprocessing and Feature Engineering  
- Exploratory Data Analysis (EDA)  
- Models: Logistic Regression, Random Forest, XGBoost, SVM, KNN  
- Evaluation Metrics: Accuracy, Precision, Recall, ROC-AUC

## 3. Results

XGBoost performed the best with ~92% accuracy. Key predictors included contract type, monthly charges, and tenure. Visualizations and feature importance analysis supported model insights.

## 4. Business Insights

- Customers on month-to-month contracts are more likely to churn.  
- High charges and lack of additional services correlate with churn.  
- Models can help target at-risk customers for retention campaigns.

## 5. Future Scope

Future enhancements include model deployment with FastAPI and SHAP value integration for explainability.