Customer Churn Analysis for a Telecom Company

1. Project Overview
This project focuses on understanding customer churn in a telecom company using the Telco Customer Churn dataset. The main objective is to analyze behavioral and service usage patterns to predict which customers are likely to leave the service. A machine learning model is developed to classify customers as "Churn" or "Not Churn," and the most important factors influencing churn are identified using explainable AI tools.

2. Dataset Summary
The dataset contains customer information such as tenure, monthly charges, payment methods, contract type, internet service, support calls, and churn status. These features help in understanding customer behavior and building a predictive model.

3. Approach
• Performed data cleaning and handled missing values.
• Conducted exploratory data analysis (EDA) to identify churn trends.
• Encoded categorical variables and scaled numerical features.
• Split the data into training and testing sets.
• Trained classification models such as Logistic Regression and Random Forest.
• Used accuracy, precision, recall, and F1-score to evaluate model performance.
• Applied ELI5/SHAP to identify the most influential features contributing to churn.

4. Key Insights
• Customers on month-to-month contracts had significantly higher churn rates.
• Higher monthly charges increased churn likelihood.
• Customers with short tenure were more likely to leave the service.
• Electronic check payment users showed higher churn compared to other payment methods.

5. Customer Segmentation
Based on churn probability scores, customers were segmented into:
• **At Risk:** High churn probability; require immediate retention strategies.
• **Dormant:** Low usage, irregular payments; need re-engagement plans.
• **Loyal:** Long tenure and stable usage; maintain with loyalty benefits.

6. Recommendations
• Provide attractive long-term plans for month-to-month customers.
• Offer discounts or personalized plans for high-charge users.
• Improve onboarding and customer support for new/short-tenure customers.
• Encourage secure and auto-payment methods to reduce churn risk.

Conclusion
The churn prediction model helps identify vulnerable customers early, allowing the telecom company to take proactive measures. The insights gained can directly support business strategies focused on customer retention and improved service experience.