Project Summary : Churn Prediction

1. Project Overview:

- This project aimed to predict customer churn using machine learning techniques. By analyzing customer data, the goal was to forecast which customers are likely to leave and allow businesses to take preemptive measures to retain them, ultimately improving customer retention and increasing revenue.

2. Data Collection:

- The data used in this project was collected from kaggle a company's customer database, which included information such as customer demographics, account balance, product usage, and activity. A total of 10,000 records were collected, and the data was cleaned by handling missing values and outliers.

3. Data Analysis:

- Exploratory data analysis (EDA) was conducted to identify patterns in the data, such as the relationship between account balance and churn. Data visualizations like histograms and scatter plots were used to better understand these relationships.

4. Model Development:

- A machine learning model was developed using XGBoost due to its high performance in binary classification tasks. The data was split into training and testing sets, and cross-validation was used to tune the model's hyperparameters. The model was evaluated using metrics such as accuracy (75%), recall (85%), and AUC (0.86).

5. Model Improvement:

- The model was further optimized by using feature engineering and tuning hyperparameters to increase precision while maintaining a high recall rate.

6. Model Deployment:

- The trained model was deployed as an API using Streamlit, allowing real-time churn predictions. The model was saved using pickle and hosted on Streamlit Cloud for scalability and accessibility.

7. Monitoring & Updating:

- The model's performance is continuously monitored using Prometheus and Grafana. Alerts are set up to notify the team if the model's performance drops below a certain threshold, prompting a retraining process.

8. Business Impact:

- The churn prediction model has had a significant impact on the business by identifying customers who are likely to leave. This has allowed the company to take proactive retention actions, such as personalized offers, thereby increasing customer retention and improving revenue.

9. Conclusion:

- This project demonstrates the value of using machine learning for churn prediction, providing businesses with actionable insights to retain valuable customers and drive long-term success.