Credit-Card-Fraud-Detection-Project-Summary

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Problem Statement

Business Problem Overview

Credit card fraud leads to massive financial losses in the banking industry. With the rise in digital payments, it is critical to identify fraudulent transactions to maintain customer trust and reduce losses. This project uses machine learning to detect fraud accurately, helping banks automate monitoring and minimize false charges.

Dataset Overview

The dataset contains anonymized credit card transactions from European cardholders over two days in September 2013. It includes 28 PCA-transformed features (V1-V28), along with 'Time', 'Amount', and a 'Class' label (1 = fraud, 0 = genuine). The dataset is highly imbalanced with fraud cases being only 0.17% of the total.

Project Pipeline

1. Data Understanding and Cleaning
2. Exploratory Data Analysis (EDA)
3. Train-Test Split and Handling Class Imbalance
4. Model Building using Logistic Regression and Random Forest
5. Model Evaluation with Confusion Matrix, Precision, Recall, and ROC-AUC

Conclusion

The project demonstrates how machine learning can be used to detect credit card fraud effectively. Despite the class imbalance, the models built in this project achieve high recall, ensuring that fraudulent transactions are identified accurately while minimizing false positives.