



MKSSS CUMMINS COLLEGE OF ENGINEERING FOR WOMEN, PUNE

AIML LABORATORY PRACTICAL EXAM 2025-
26

TY BTECH COMP A (A1)

SMART FINANCIAL DASHBOARD: LOAN, CREDIT CARD, AND FRAUD PREDICTION

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INTRODUCTION

Financial organizations today handle massive volumes of data and transactions, making manual decision-making processes increasingly impractical. Traditional methods for assessing loan eligibility, credit card approval, and detecting fraudulent activity are often time-consuming, prone to human error, and inefficient in terms of resource utilization.

Our Smart Financial Dashboard addresses these challenges by providing an integrated, automated solution that combines predictive analytics for loan approval, credit card eligibility, and anomaly detection for fraud. This enables faster, more accurate, and data-driven decision-making, ultimately improving operational efficiency and reducing financial risk.



PROJECT OBJECTIVES

01.

Automate Financial
Decision-Making

- Reduce manual effort and improve accuracy in loan and credit approval processes.

02.

Enhance Fraud
Detection

- Identify and prevent anomalous transactions to safeguard financial operations.

03.

Integrate Multiple
Financial Services

- Provide a unified platform for loan prediction, credit card approval, and fraud monitoring.

04.

Support Data-
Driven Insights

- Visualize key metrics and model predictions for informed decision-making by financial institutions.



1. LOAN APPROVAL PREDICTION

Enter Loan Applicant Details

Gender:	Male
Married:	Yes
Dependents:	0
Education:	Graduate
Self Employed:	No
Applicant Income:	e.g., 5000
Coapplicant Income:	e.g., 2000
Loan Amount:	e.g., 150
Loan Term (months):	e.g., 360
Credit History:	Yes
Property Area:	Urban
Choose Model:	Random Forest

Purpose: Predict loan approval based on applicant data.

Models used:

1. CatBoost (89.2% accuracy)
2. Random Forest (85.4% accuracy)
3. Decision Tree (79.2% accuracy)
4. Logistic Regression (85.4% accuracy)

Dataset:

<https://www.kaggle.com/code/yonatanrabinovich/loan-prediction-dataset-ml-project/notebook>

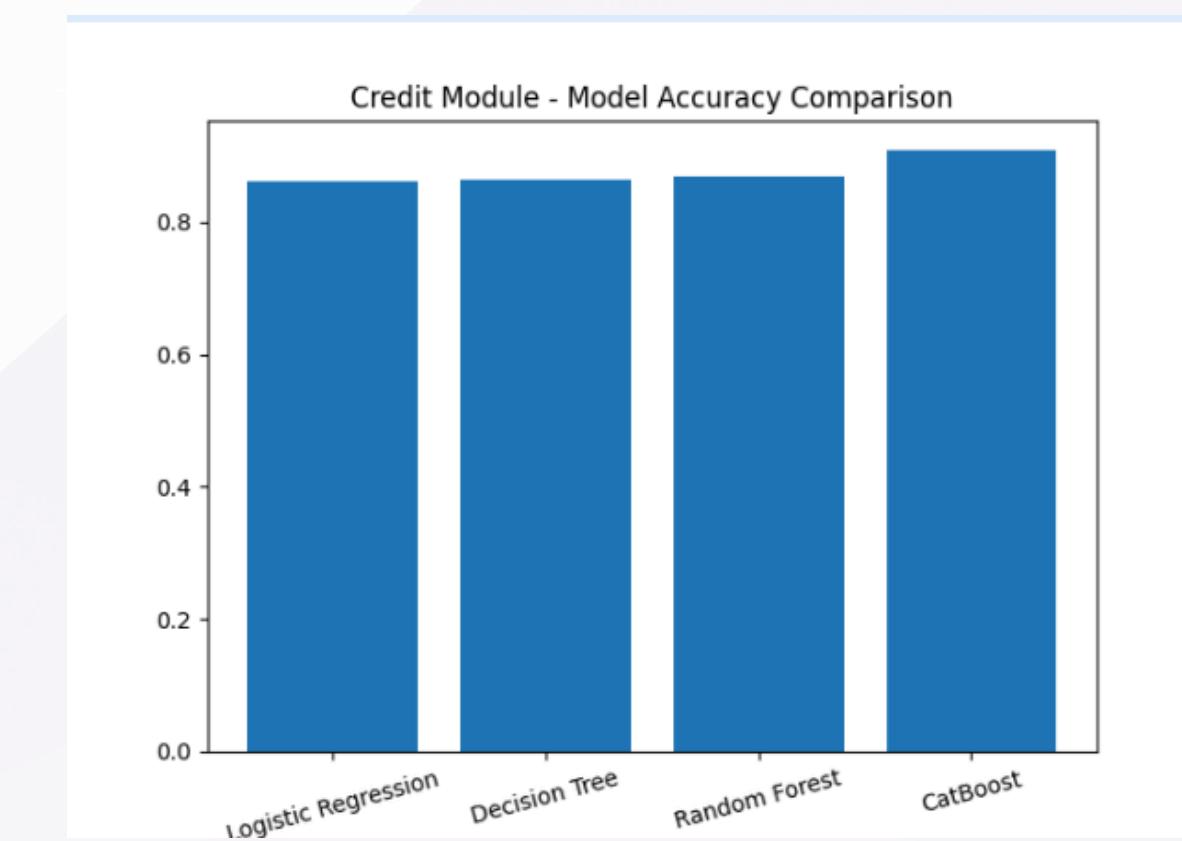


2. CREDIT CARD APPROVAL PREDICTION

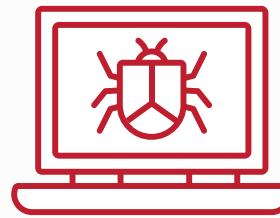
Enter Credit Card Applicant Details

Gender:	Male
Car Owner:	Yes
Property Owner:	Yes
Number of Children:	0
Annual Income:	e.g., 180000
Income Type:	Working
Education:	Higher education
Marital Status:	Married
Housing Type:	House / apartment
Birthday Count:	e.g., -18772
Employed Days:	e.g., 365243
Has Mobile Phone:	Yes
Has Work Phone:	No
Has Phone:	No

Purpose: Evaluate and compare models to select the most accurate predictor for loan approvals.



Dataset



3. FRAUD & ANOMALY DETECTION

Smart Finance Dashboard
AI-Powered Loan & Credit Card Approval Prediction System

Fraud Detection (Unsupervised)

Transaction Amount:

Customer Age:

Transaction Duration (seconds):

Login Attempts:

Account Balance:

Detect Fraud

Purpose: Identify unusual or suspicious transactions to detect potential fraud in banking data.

Model used: Isolation Forest (unsupervised)

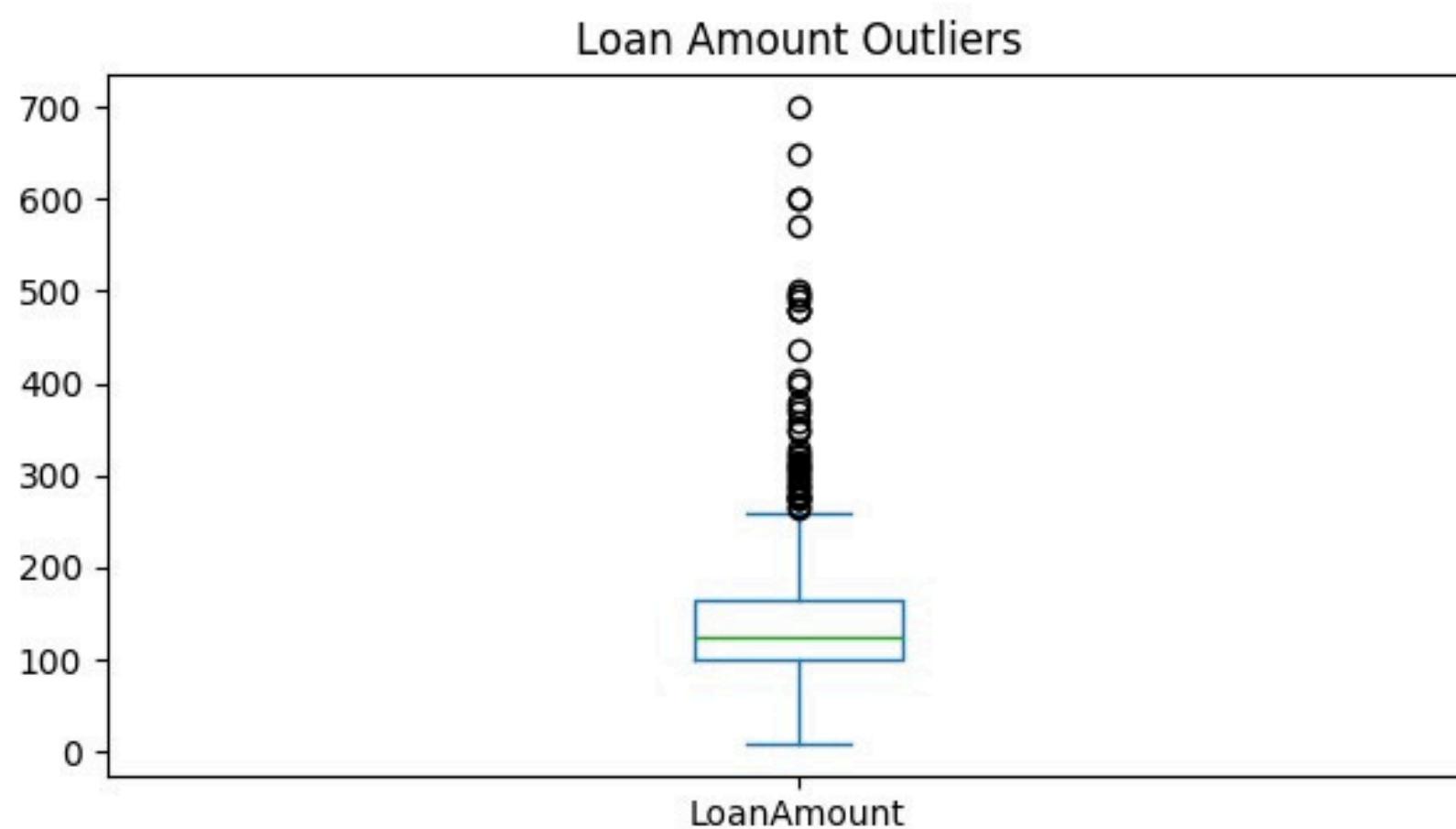
Model working: Isolation Forest isolates abnormal points by splitting features. Transactions that require fewer splits are flagged as anomalies.

Dataset:

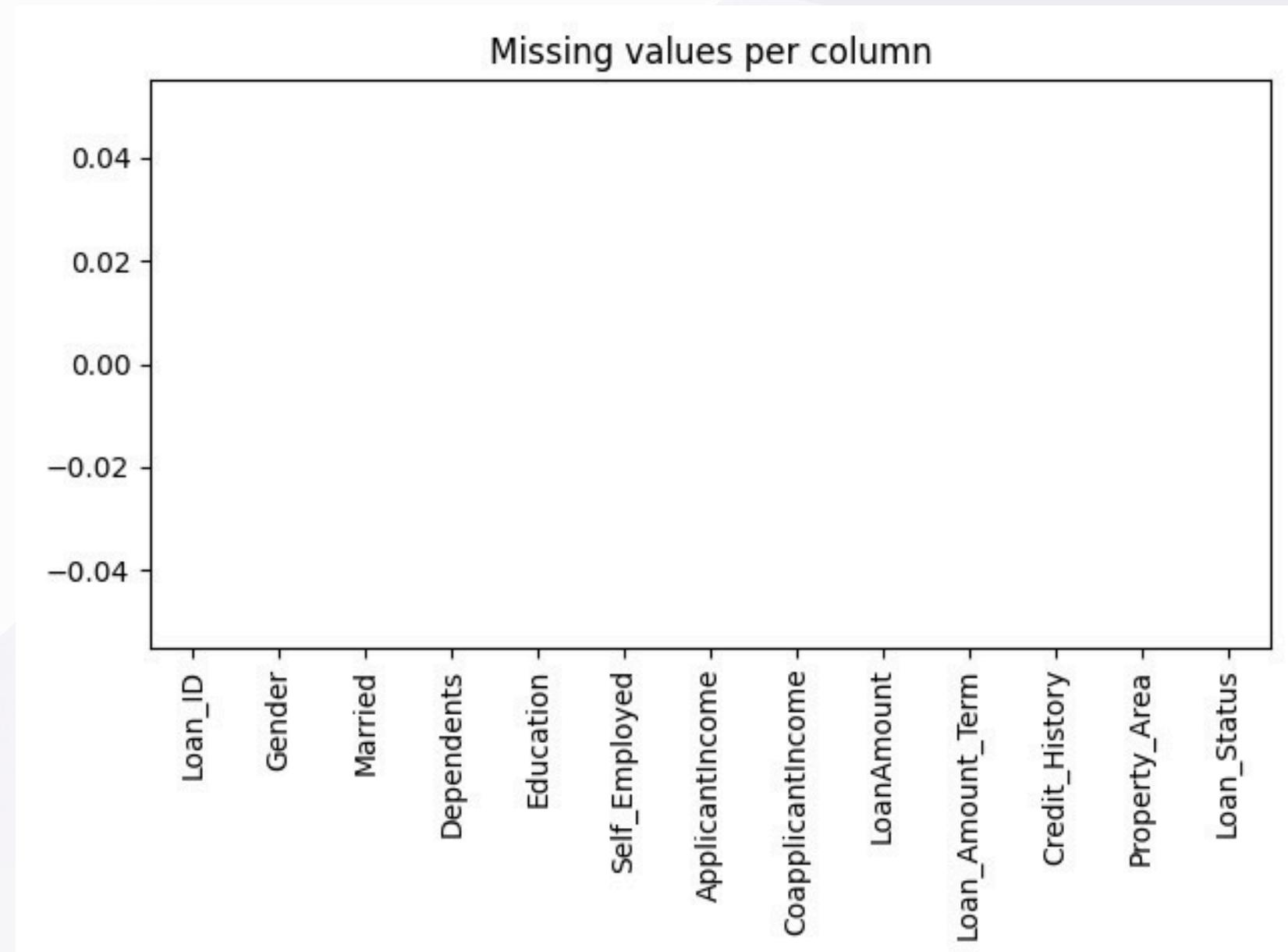
<https://www.kaggle.com/code/mishashikhov/bank-fraud-detection-and-transaction-analysis/input>

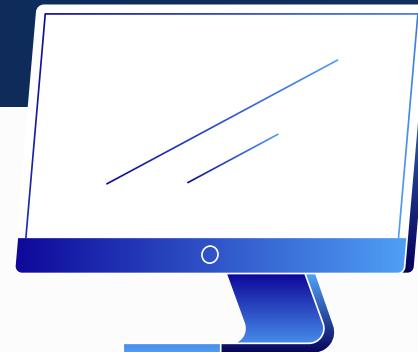
DATA PREPROCESSING

Before Pre-Processing



After Pre-Processing





DASHBOARD IMPLEMENTATION

Frontend: HTML, CSS, JavaScript

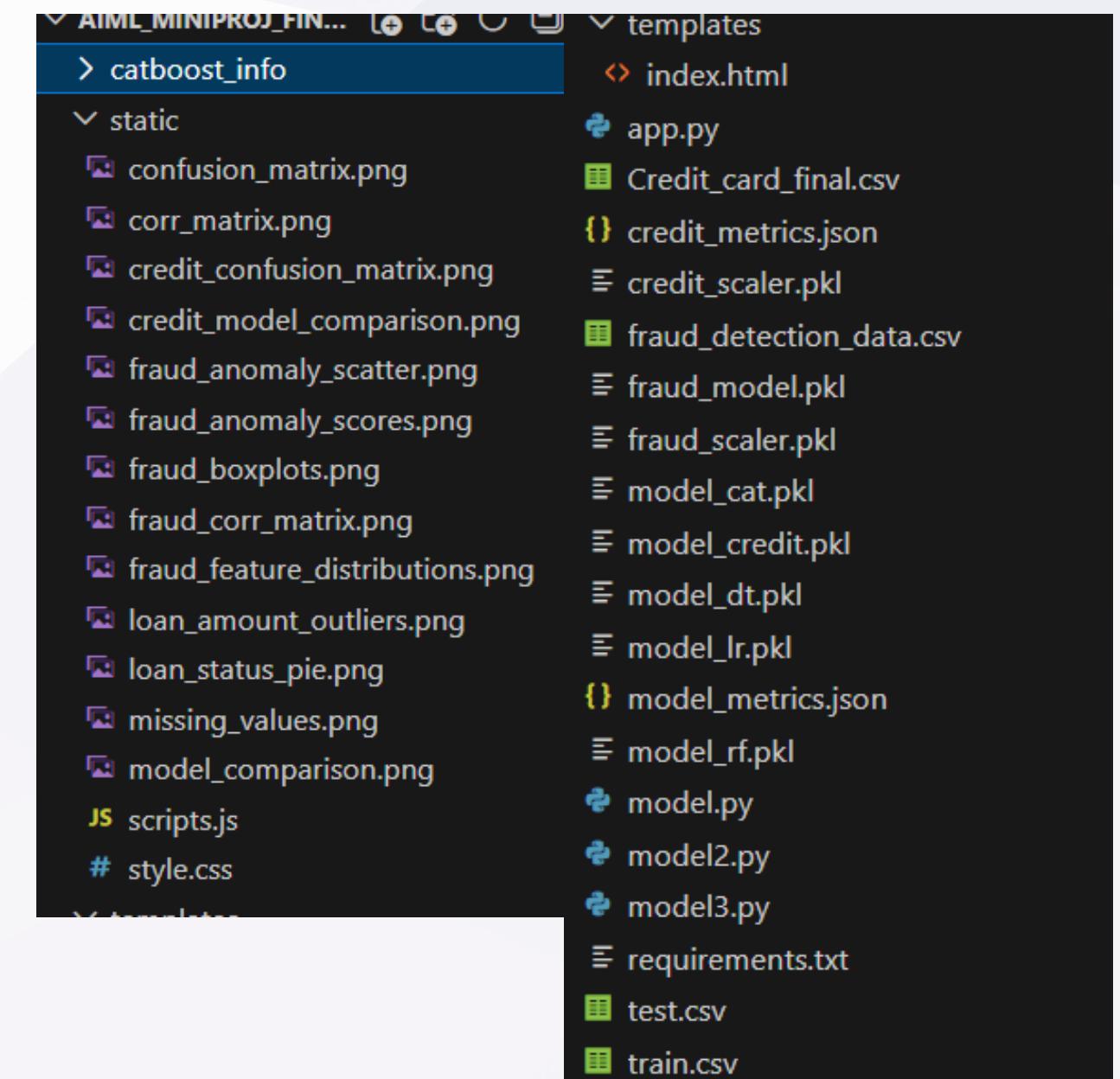
Backend: Python / Flask

- Data based predictions for Loan, Credit Card, and Fraud Detection.
- Dashboard shows model comparison, feature importance, and anomaly outputs.
- Simple and user-friendly interface for quick decision-making.

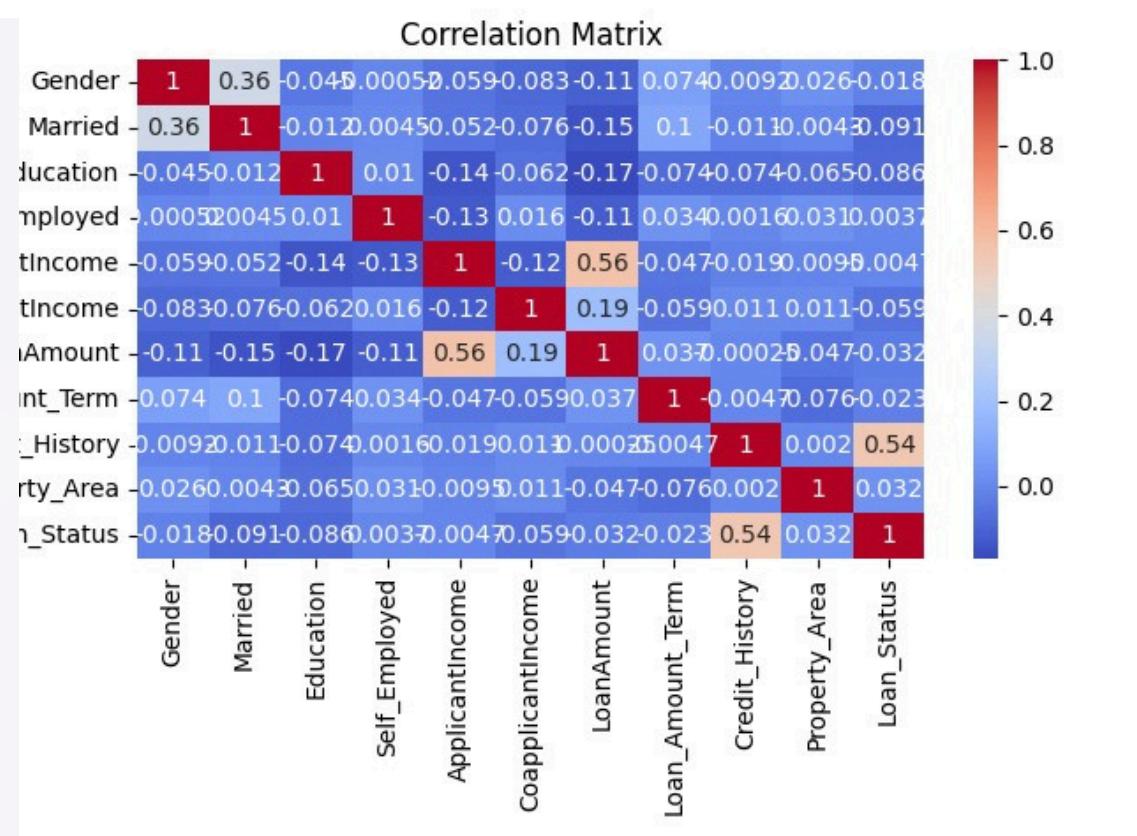
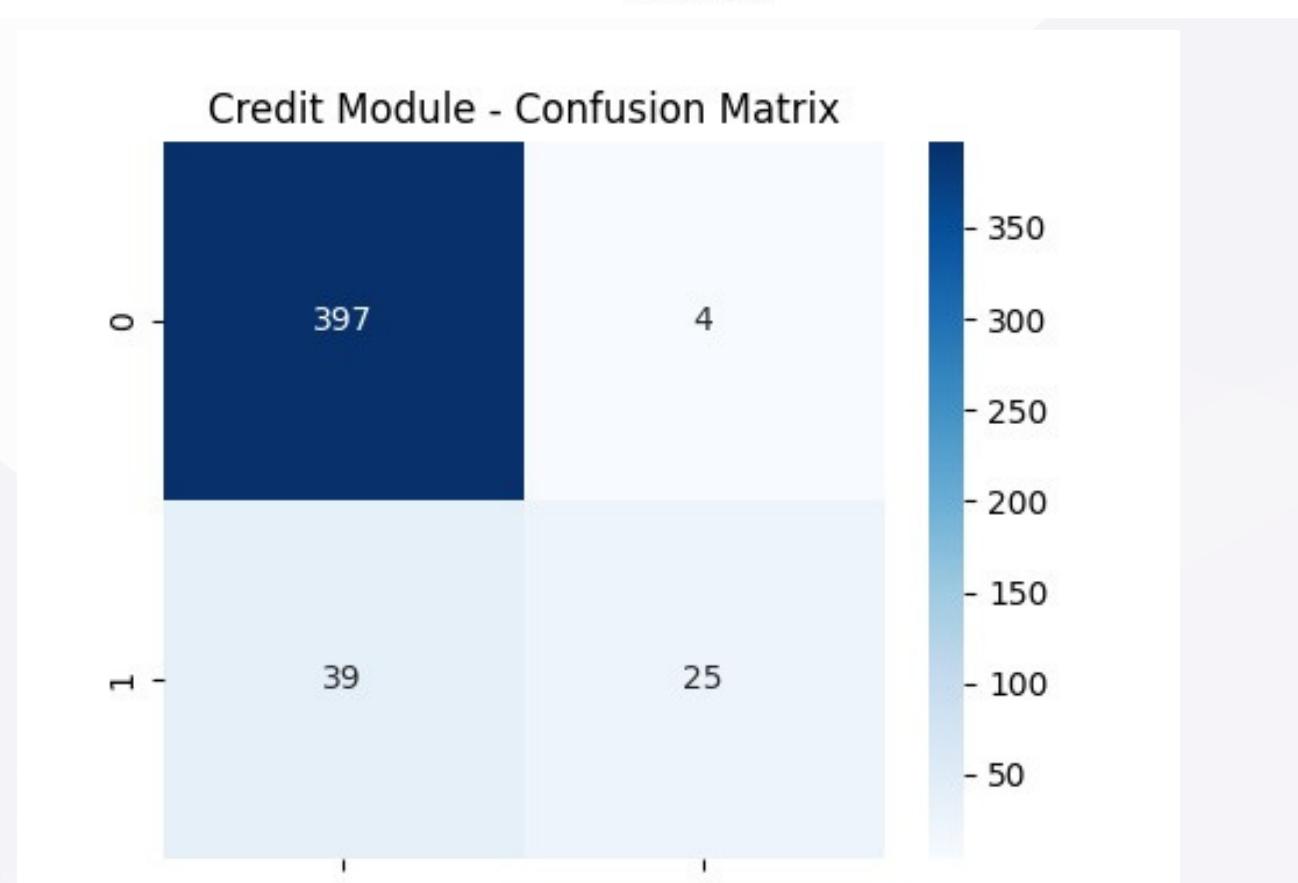
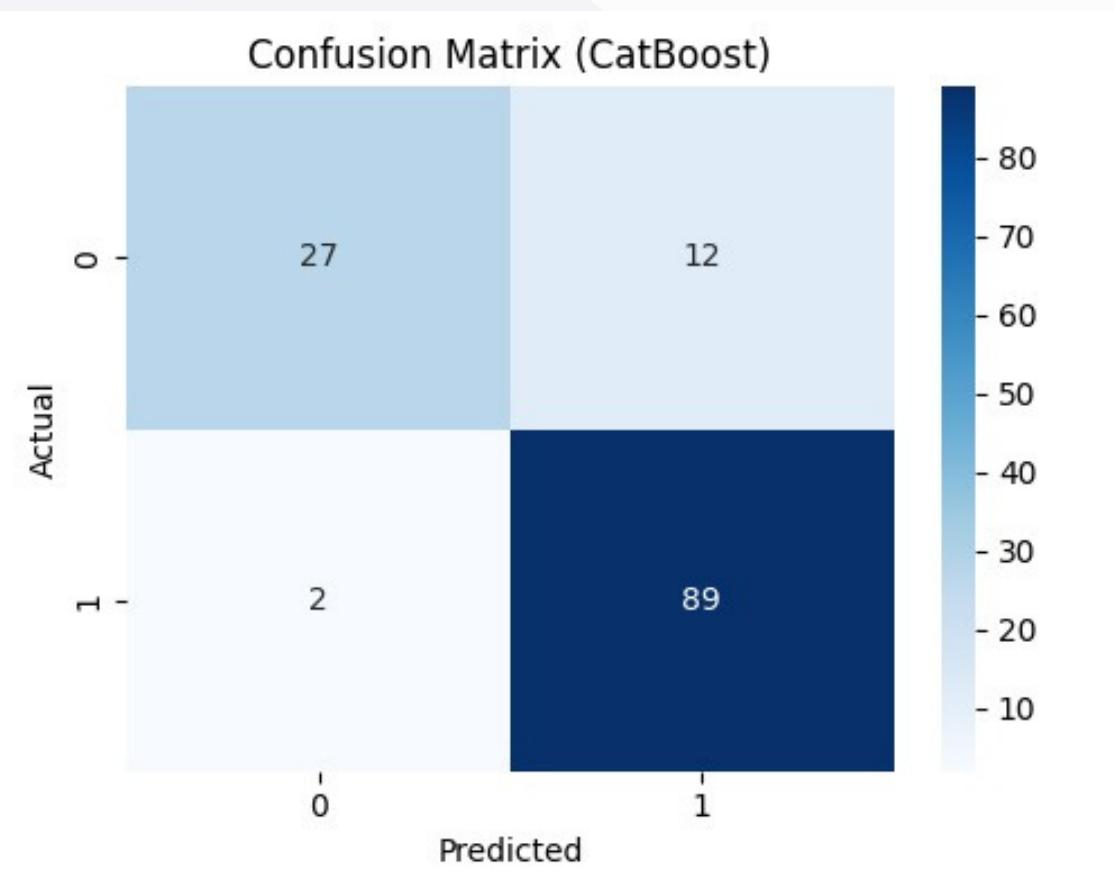
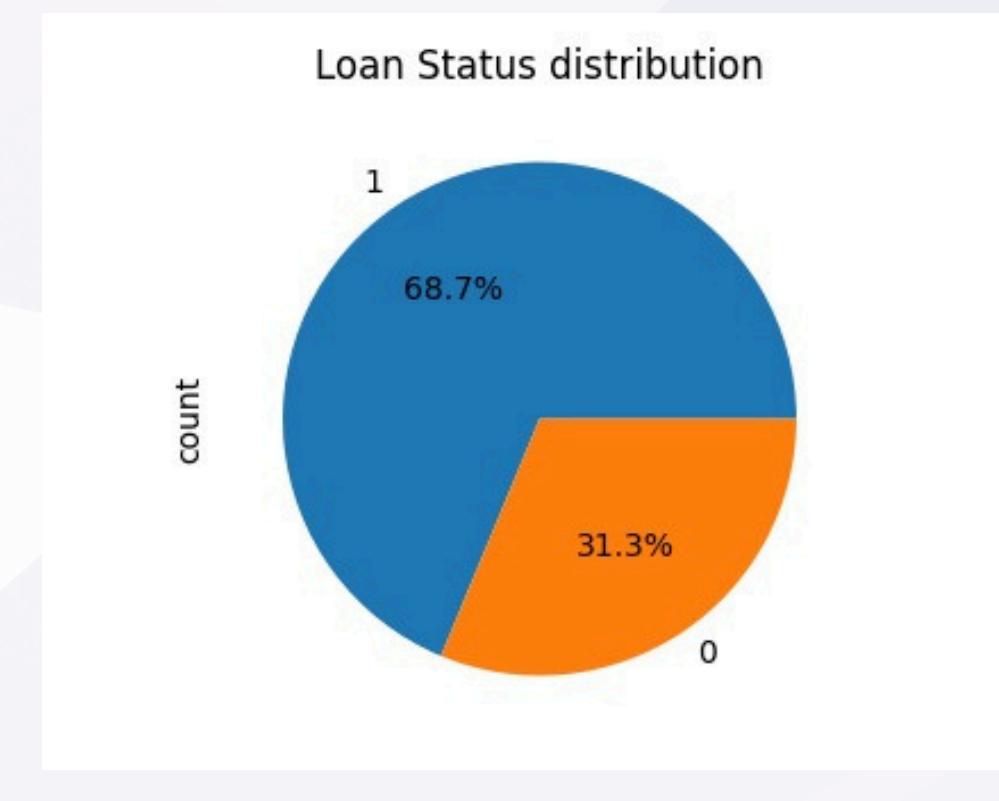
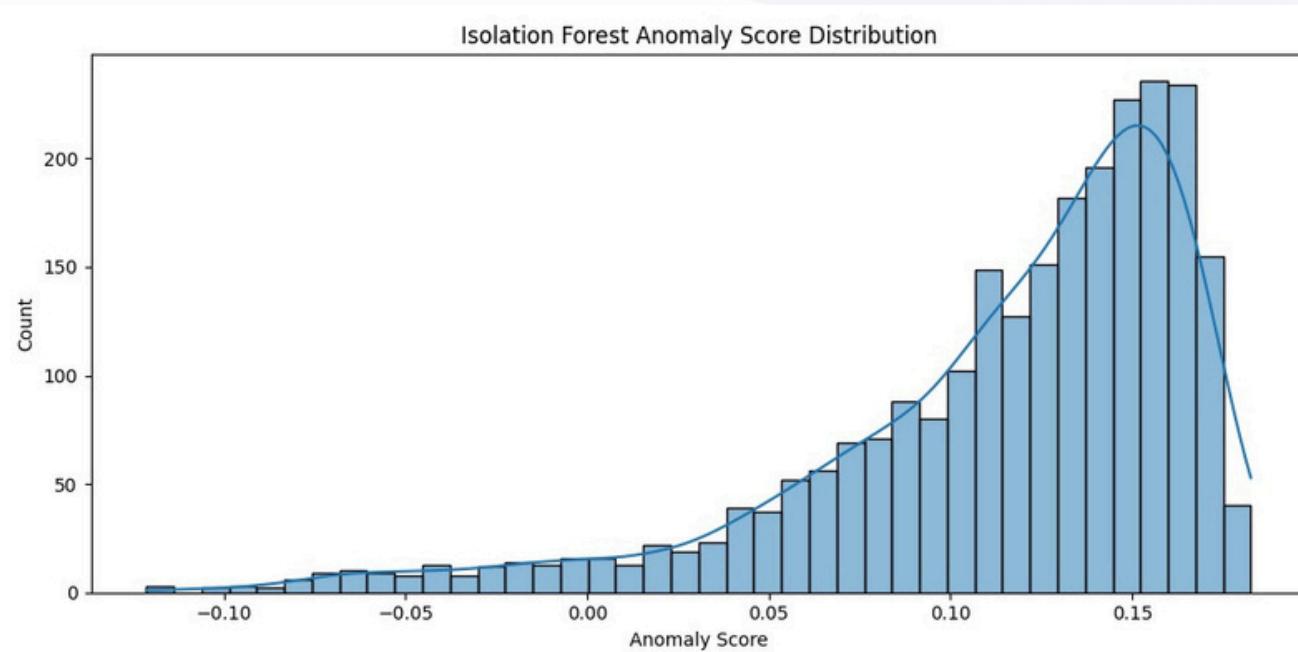
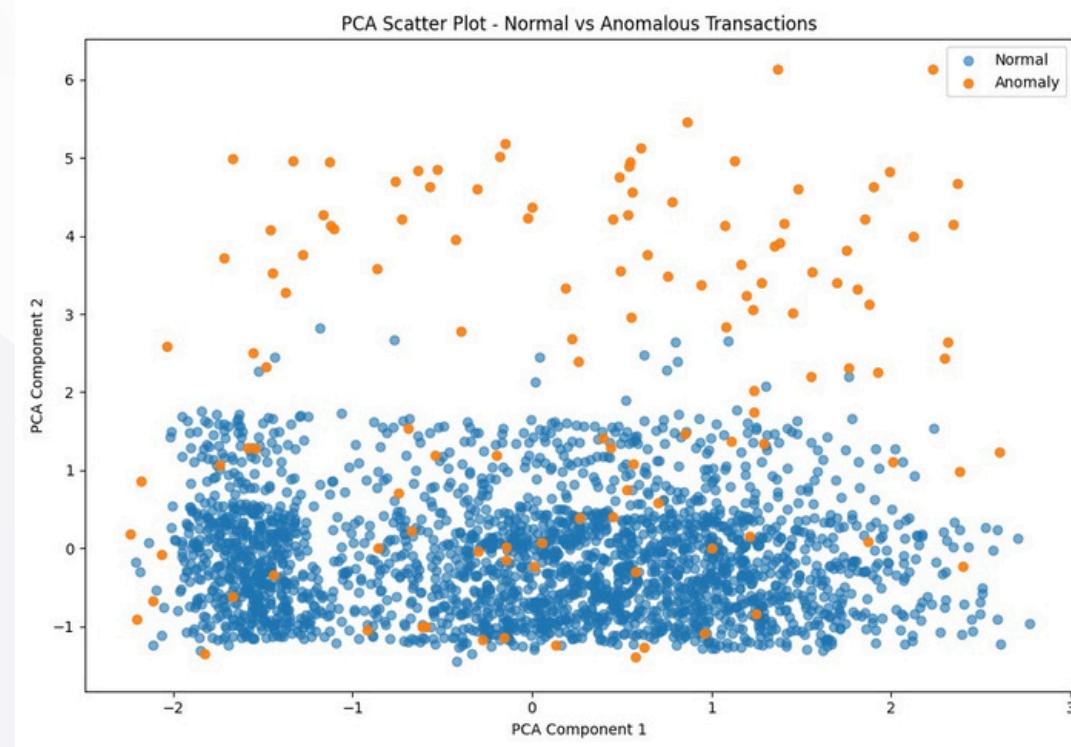
Model Files & JSON Metrics:

- Trained models and scalers are saved as .pkl files → faster loading, no need to retrain every time.
- Evaluation results are stored in JSON files → easy to display model accuracy, precision, recall, and F1-score in the dashboard.
- Supports versioning, reproducibility, and smooth deployment.

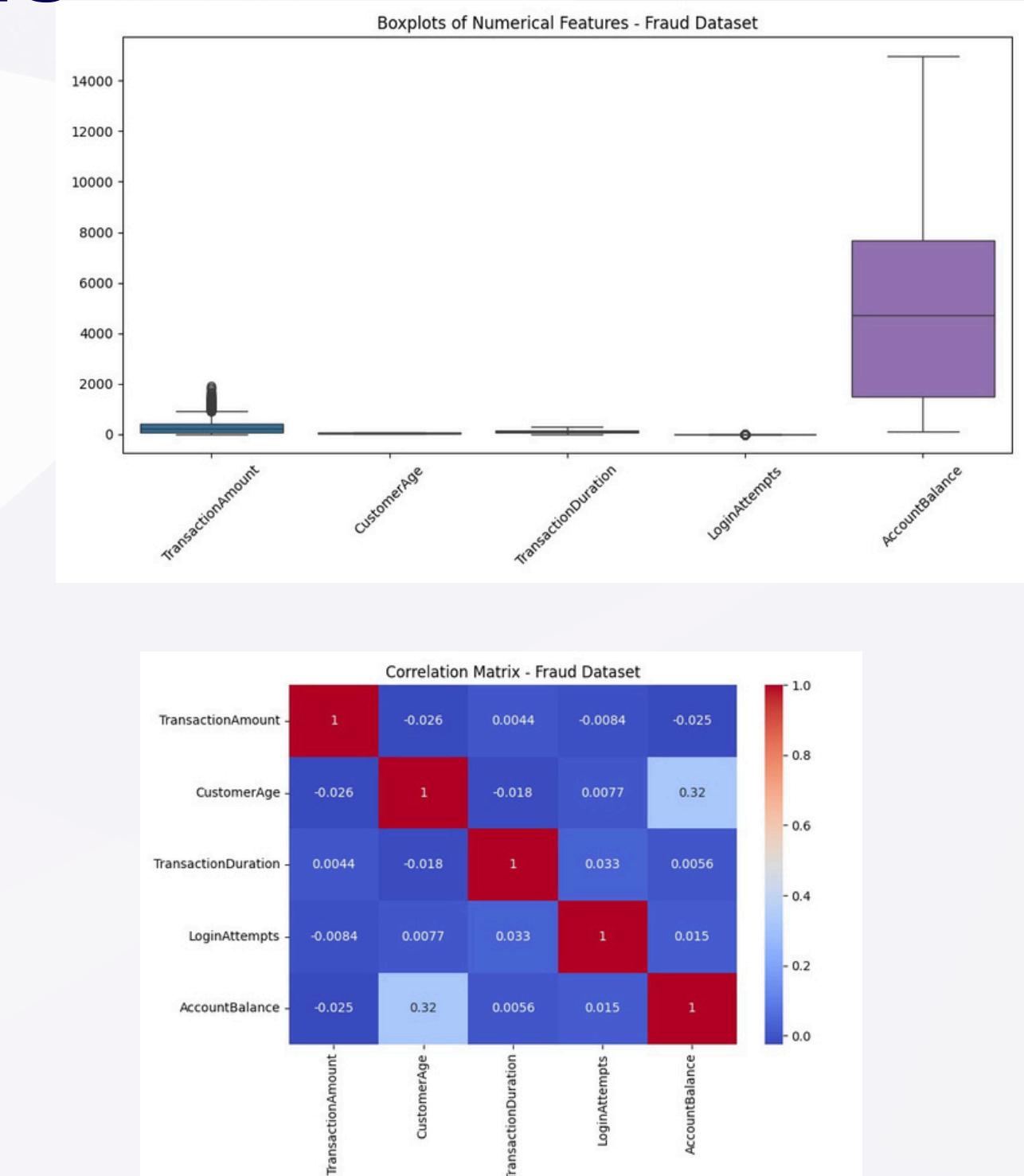
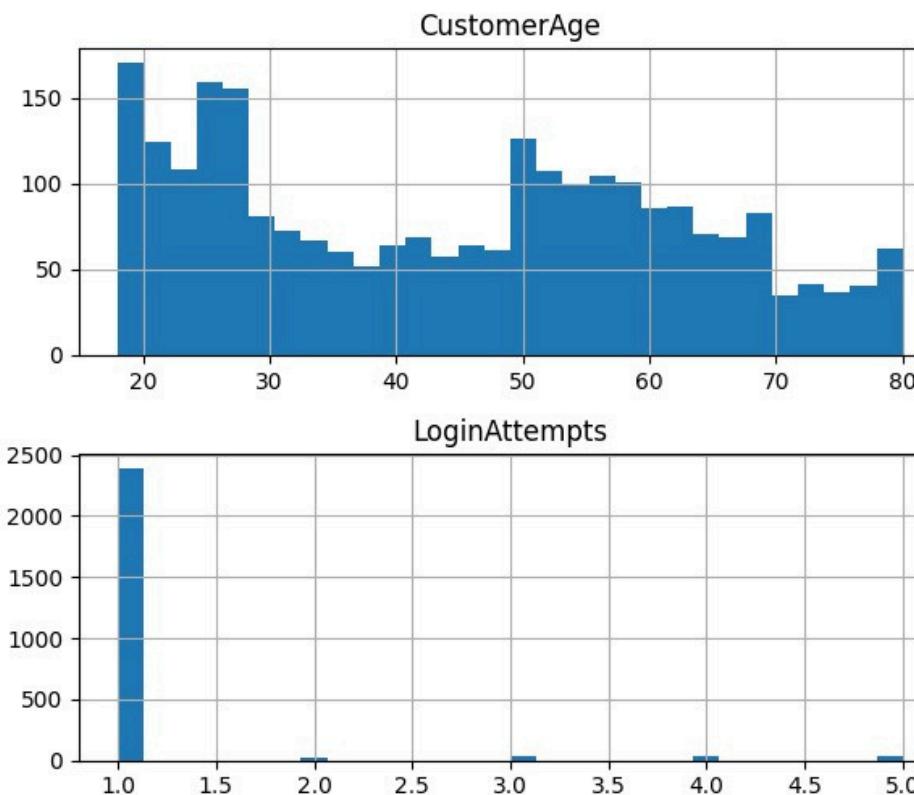
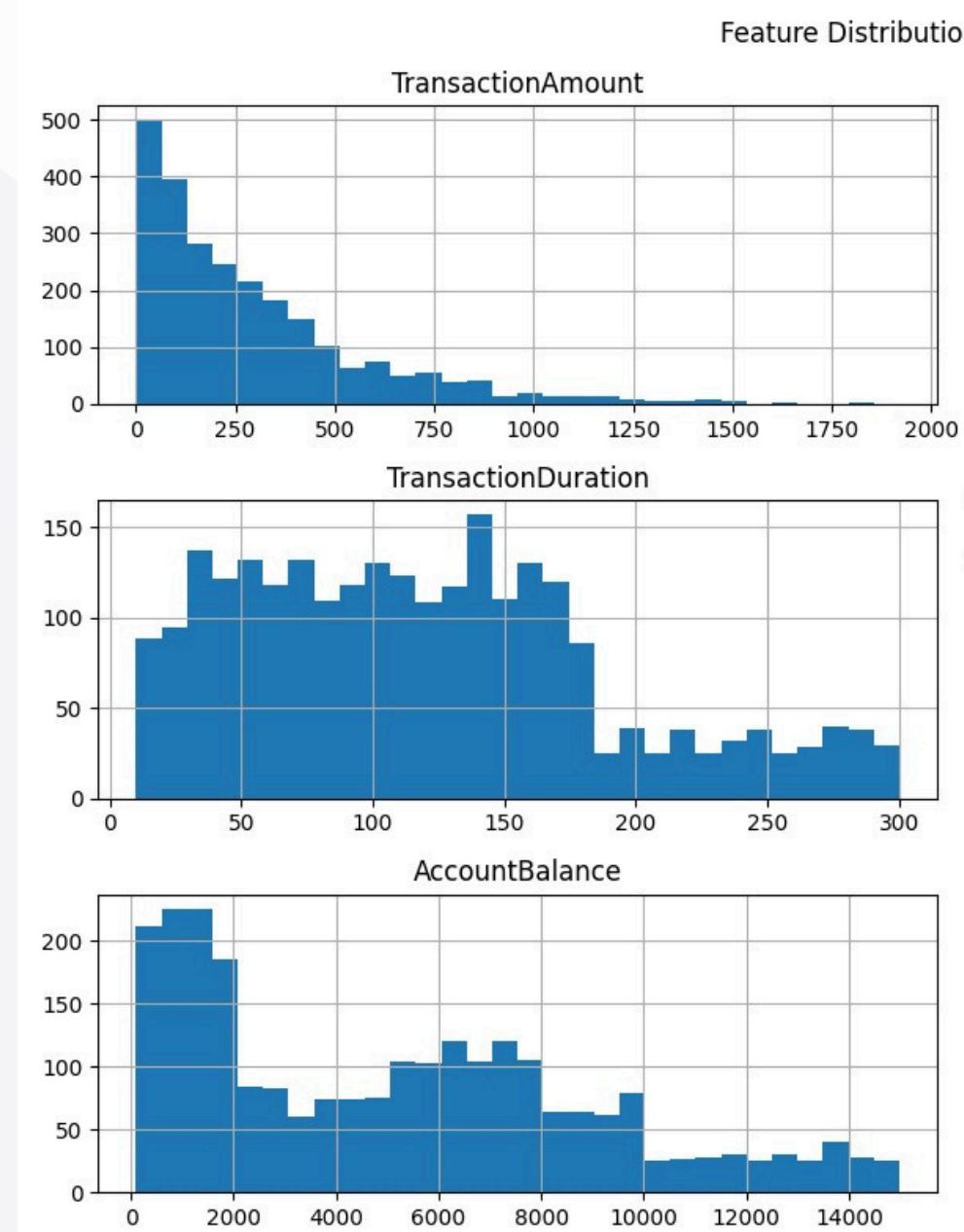
File structure



VISUALIZATIONS



VISUALIZATIONS



RESULTS

Choose Model:

CatBoost

 Predict Loan Approval

Prediction Result:

Loan Approved

Model Performance (CatBoost)

Metric	Value
Accuracy	0.892
Precision	0.881
Recall	0.978
F1-Score	0.927

 Predict Credit Card Approval

Prediction Result:

Credit Card Approved

Model Performance (CatBoost)

Metric	Value
Accuracy	0.908
Precision	0.862
Recall	0.391
F1-Score	0.538

RESULTS

Fraud Detection (Unsupervised)

Transaction Amount: 1129

Customer Age: 78

Transaction Duration (seconds): 81

Login Attempts: 1

Account Balance: 5112

 Detect Fraud

Fraud Detection Result

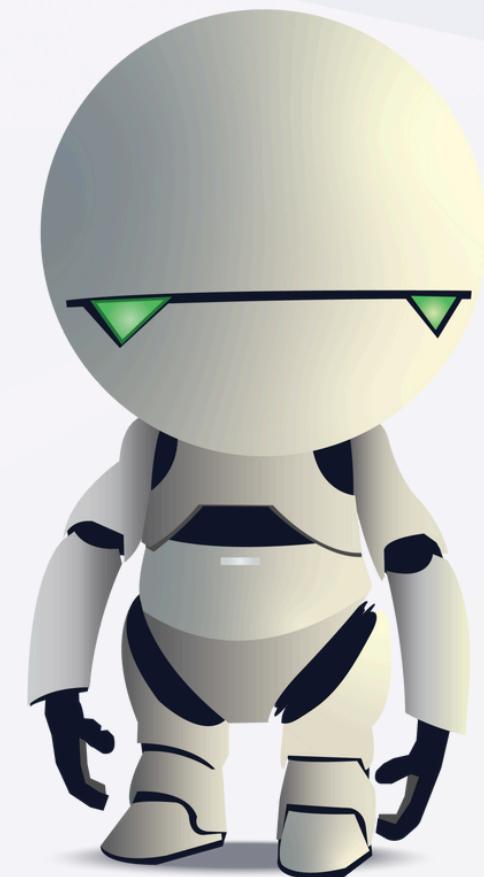
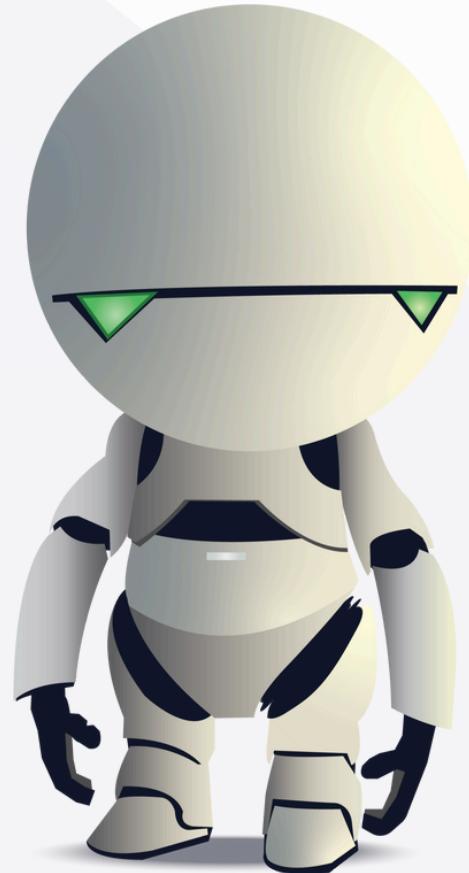
Transaction is Normal

Anomaly Score: 0.00740835120782235

CONCLUSION

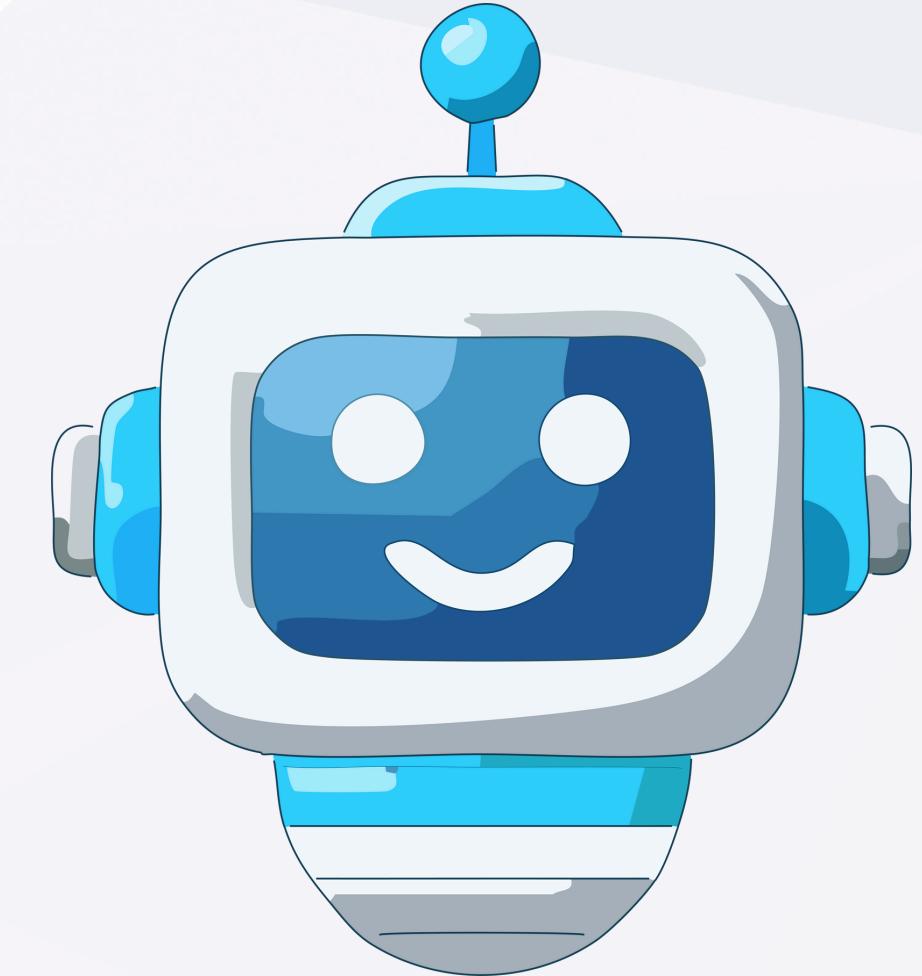
The Smart Financial Dashboard successfully integrates Loan Prediction, Credit Card Approval, and Fraud Detection into a single, unified platform. By leveraging multiple models and rigorous preprocessing, the system achieves high accuracy and provides reliable predictions for financial decision-making. Fraud detection is effectively handled using unsupervised anomaly modeling with Isolation Forest, enabling early identification of suspicious activities.

The dashboard offers clear visualizations, real-time predictions, and an intuitive user interface, ensuring ease of use for end-users. Additionally, saving trained models as .pkl files and storing evaluation metrics in JSON format allows for quick deployment, reproducibility, and consistent performance across sessions. Overall, this system demonstrates strong potential for practical application in banking and financial institutions, supporting automation, reducing operational risk, and improving the customer experience.



FUTURE SCOPE & ETHICAL ISSUES

- Future Enhancements: Expand the dashboard with additional financial risk models (credit scoring, churn prediction), real-time transaction monitoring with alerts, mobile integration, and cloud deployment for scalability. Incorporate deep learning (Autoencoders, LSTMs) for improved fraud detection, continuous model retraining, explainable AI (XAI), and user management with role-based access. Integration with bank APIs will enable end-to-end automated decision workflows.
- Ethical Considerations: Ensure data privacy and secure handling of sensitive customer information. Avoid bias and ensure fairness across demographics. Maintain transparency in predictions, prevent misuse of fraud alerts, and define accountability for AI-driven decisions.



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THANK YOU.