

2025

AI-POWERED LOAN STACKING DETECTION FOR DIGITAL LENDERS

GROUP 9

WHAT IS LOAN STACKING



- Loan stacking occurs when borrowers take multiple loans from different lenders simultaneously, often leading to debt cycles where new loans are used to repay old ones.

PROBLEM STATEMENT

- Digital lenders lack visibility into borrowers' full credit behavior, making it hard to detect loan stacking early.
- This leads to higher defaults and losses, highlighting the need for a smart, data-driven detection system

BUSINESS OBJECTIVES



This project aims to use behavioral data to identify & flag high risk borrowers engaging in loan stacking enabling more responsible lending decisions.

Core Questions

- Can a neural network detect early signs of loan stacking using borrowing and repayment behavior?
- Which user behaviors best predict over-indebtedness or default?
- How does a real-time loan stacking API improve credit decisions and reduce risk?

DATASET OVERVIEW

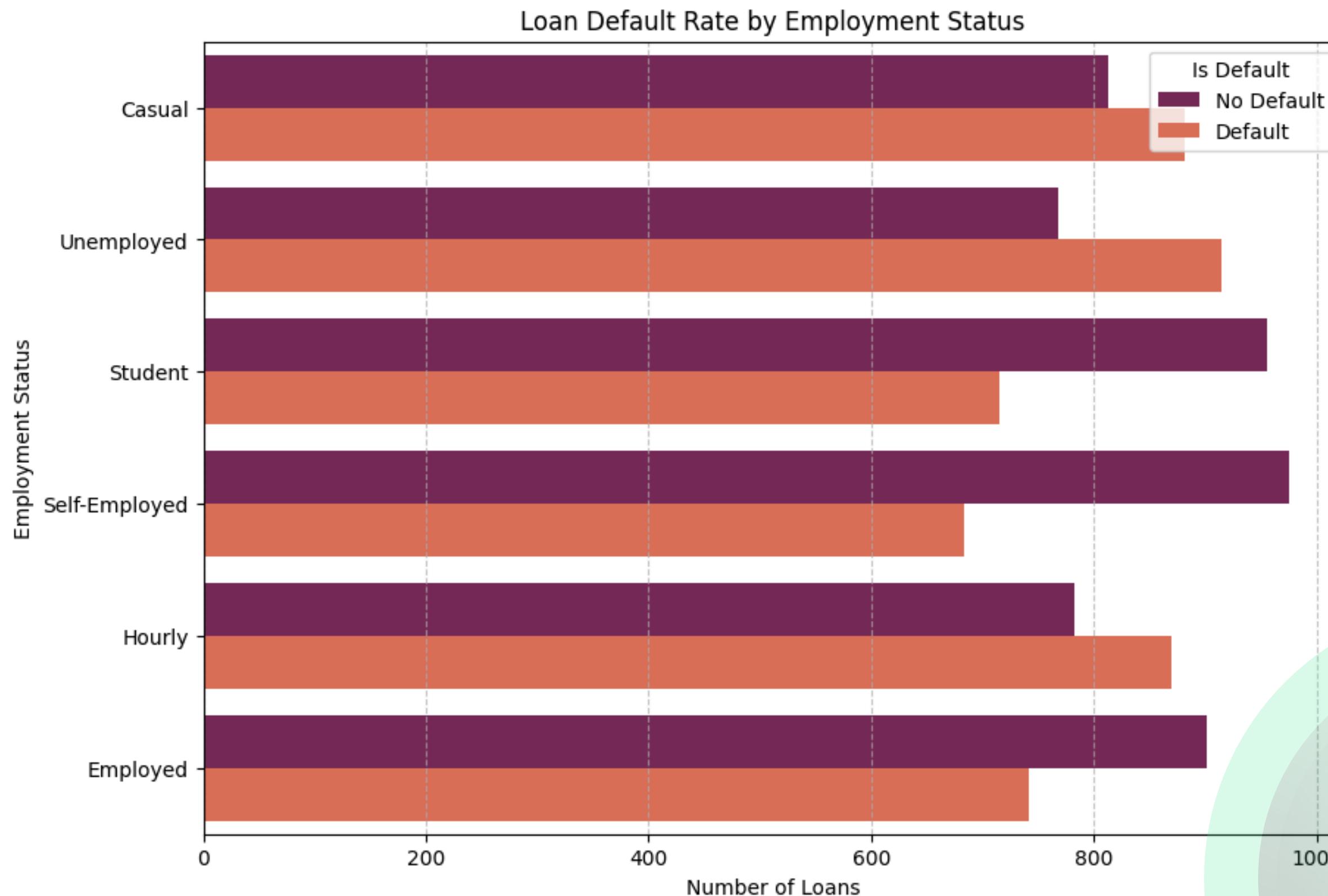
To build our model, we created a synthetic dataset that simulates real-world borrowing behavior in Kenya's mobile lending ecosystem to train and test our AI model safely and ethically.

Key Stakeholders

- 1. Financial Institutions and Lenders**
- 2. Data Science & Risk Analytics teams**
- 3. Regulators & Policy makers**
- 4. Borrowers(End User)**
- 5. Fintech Developers & Platform Providers**
- Business & Product Decision-Makers**

BUSINESS ANALYSIS

Loan default rates by employment status

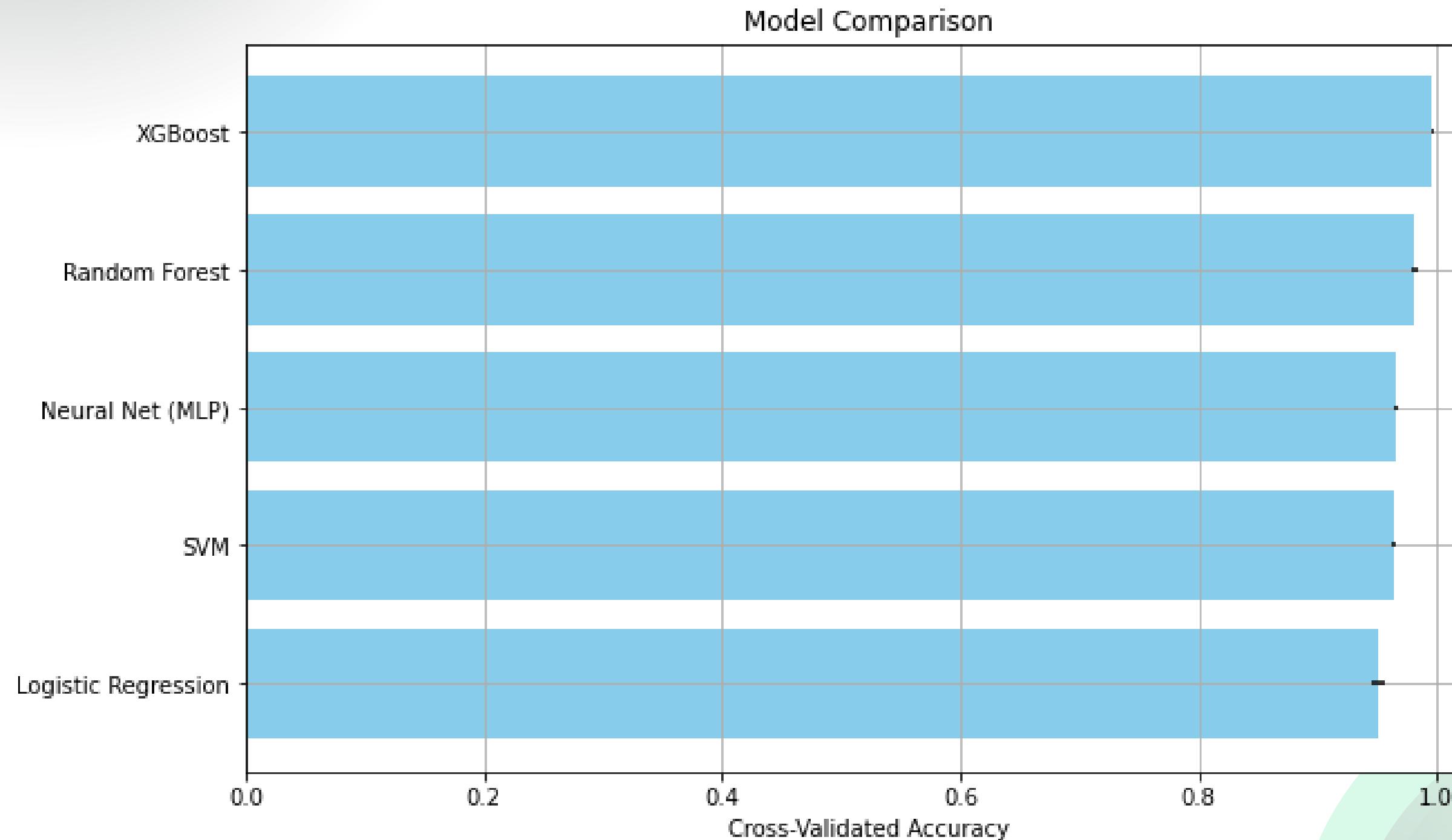


Findings

- “Hourly”, “Casual”, “Unemployed” appear to pose higher default risk.
- For business strategy lending policies should be adjusted based on borrowers employment status to mitigate loss.

EVALUATION

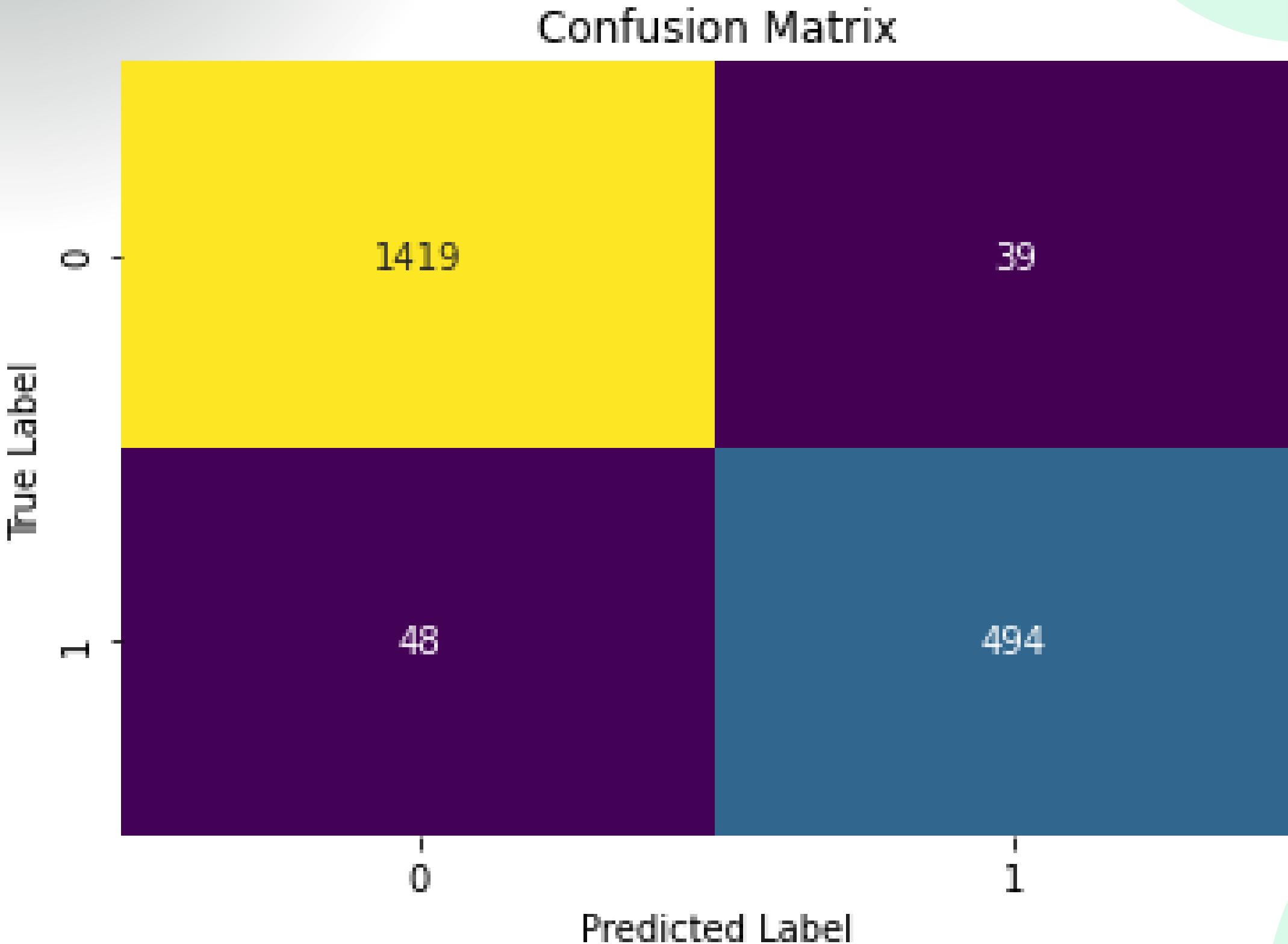
Model Comparison



Model Comparison Interpretation

- 1. Random Forest and XGBoost:**
 - Mean Accuracy: 94%
 - Standard Deviation: 0.00
 - The models achieved perfect classification across all 5 folds.
- 2. Neural Net (MLP)**
 - Mean Accuracy: 92%
 - Standard Deviation: 0.46%
- 3. SVM & Logistic Regression**
 - Mean accuracy :92%

CONFUSION MATRIX



Confusion Matrix Findings

- **True Negatives (TN)= 1410 → Correctly identified non-loan stackers**
- **False Positives (FP)=48 → Incorrectly flagged 48 safe borrowers as risky**
- **False Negatives (FN)= 78 → Missed 78 actual loan stackers**
- **True Positives (TP)= 464 → Correctly identified 464 loan stackers**

► CONCLUSIONS

Loan stacking is a hidden but critical risk affecting digital lenders in Kenya

Smart systems protect lenders by reducing operational losses

Behavioral data enables early detection of risky borrowing patterns

Collaboration among lenders strengthens the overall lending ecosystem.



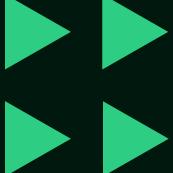
RECOMMENDATIONS

Use AI for real-time risk detection and model retraining

Integrate secure data sharing between lenders

Promote ethical lending and borrower transparency

Align with regulatory standards and fair credit practices



NEXT STEPS

Run pilot tests with real-time API

Enhance model with better features & fairness checks

Comprehensive audits for scalability and data security

Train lenders on integration and usage

GROUP 9 MEMBERS

2025

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**THANK YOU!!!
ANY QUESTIONS?**