

# FINANCIAL GUARDIAN AI: UNMASKING HIDDEN DEBT WEBS

AI-POWERED LOAN DETECTION SYSTEM  
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**

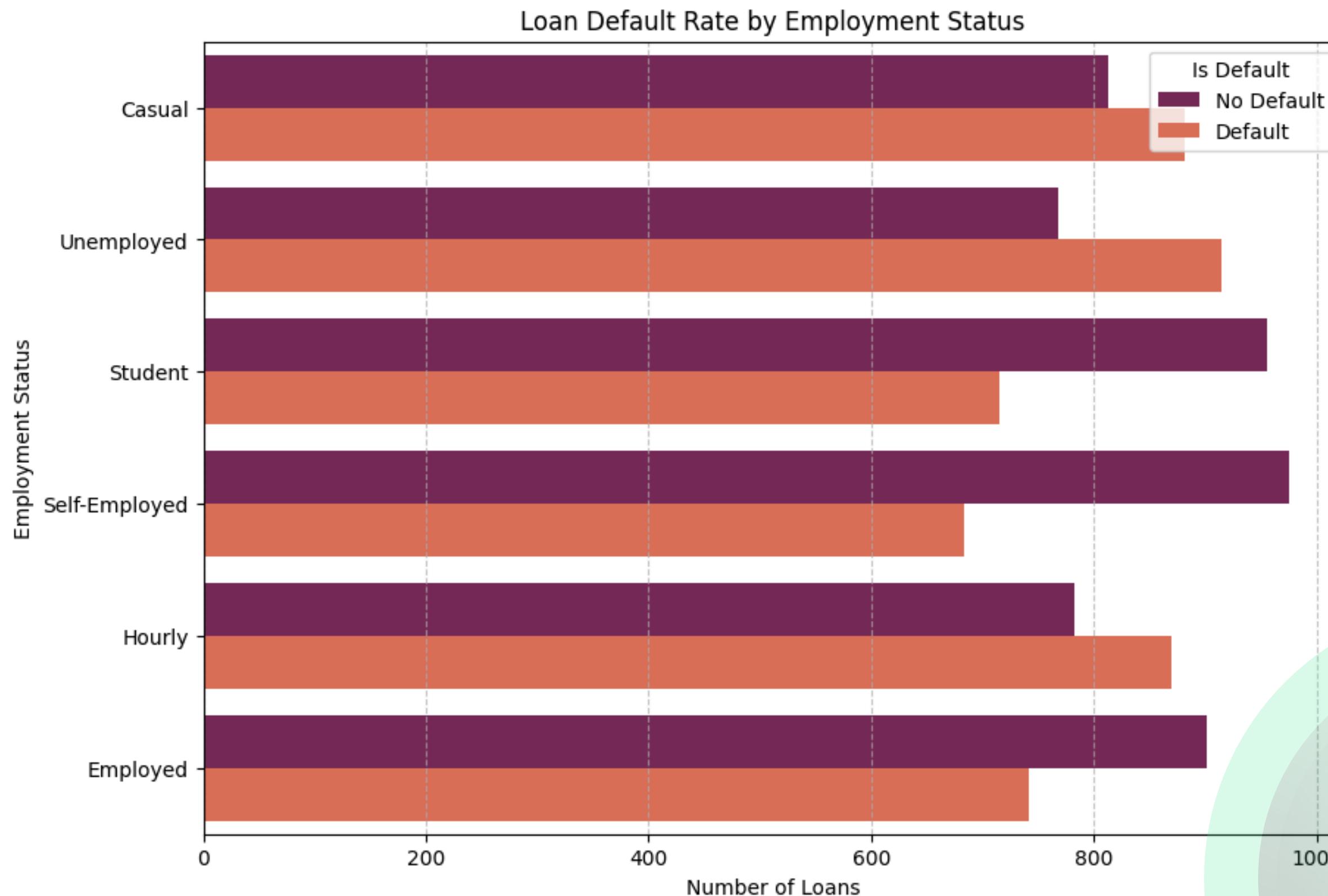
To build our model, we created a synthetic dataset that simulates real-world borrowing behavior in Kenya's mobile lending ecosystem to train and test our AI model safely and ethically.

## **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**
- 6. Business & Product Decision Makers**

# BUSINESS ANALYSIS

## Loan default rates by employment status

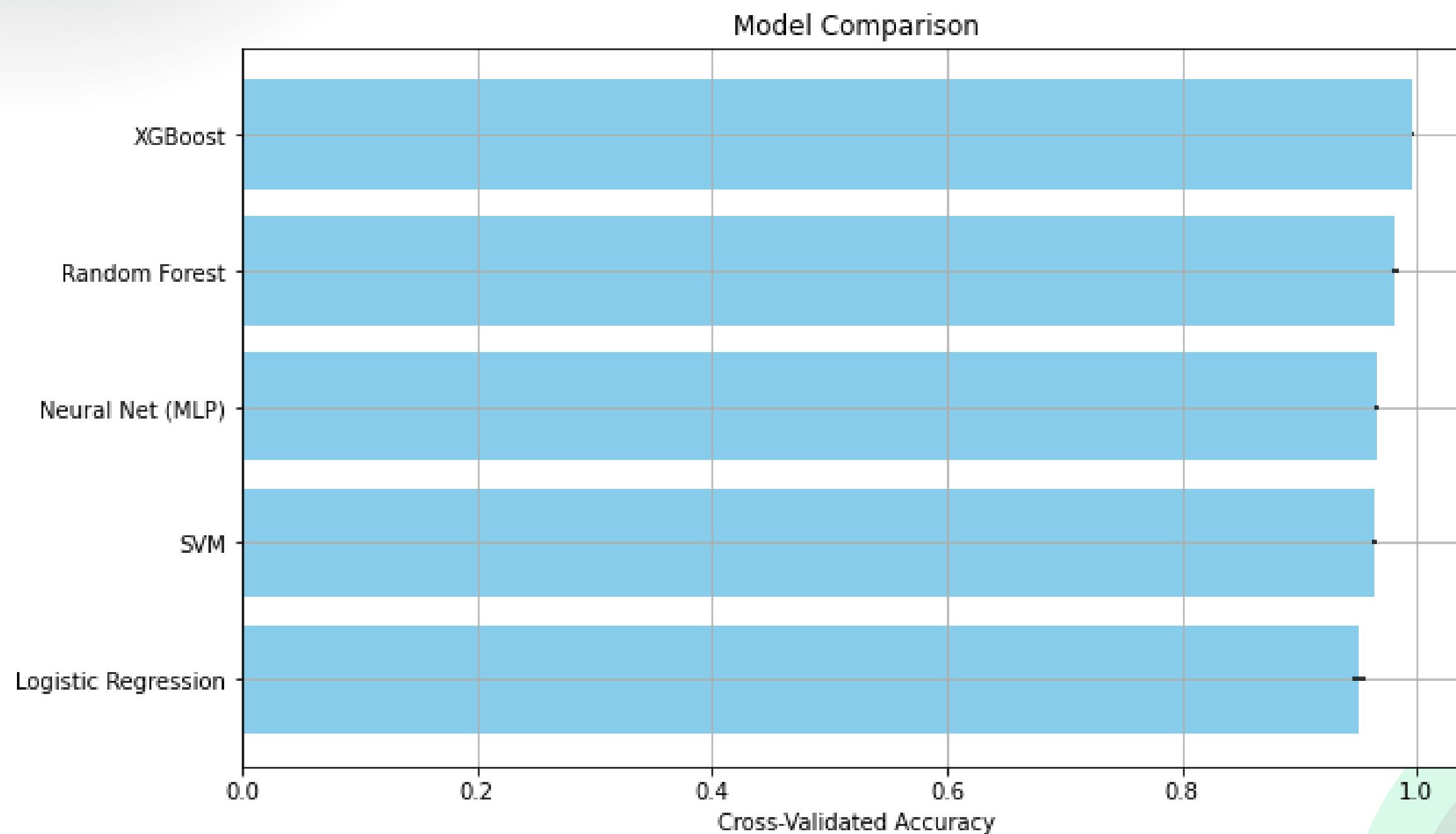


### Findings

- “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

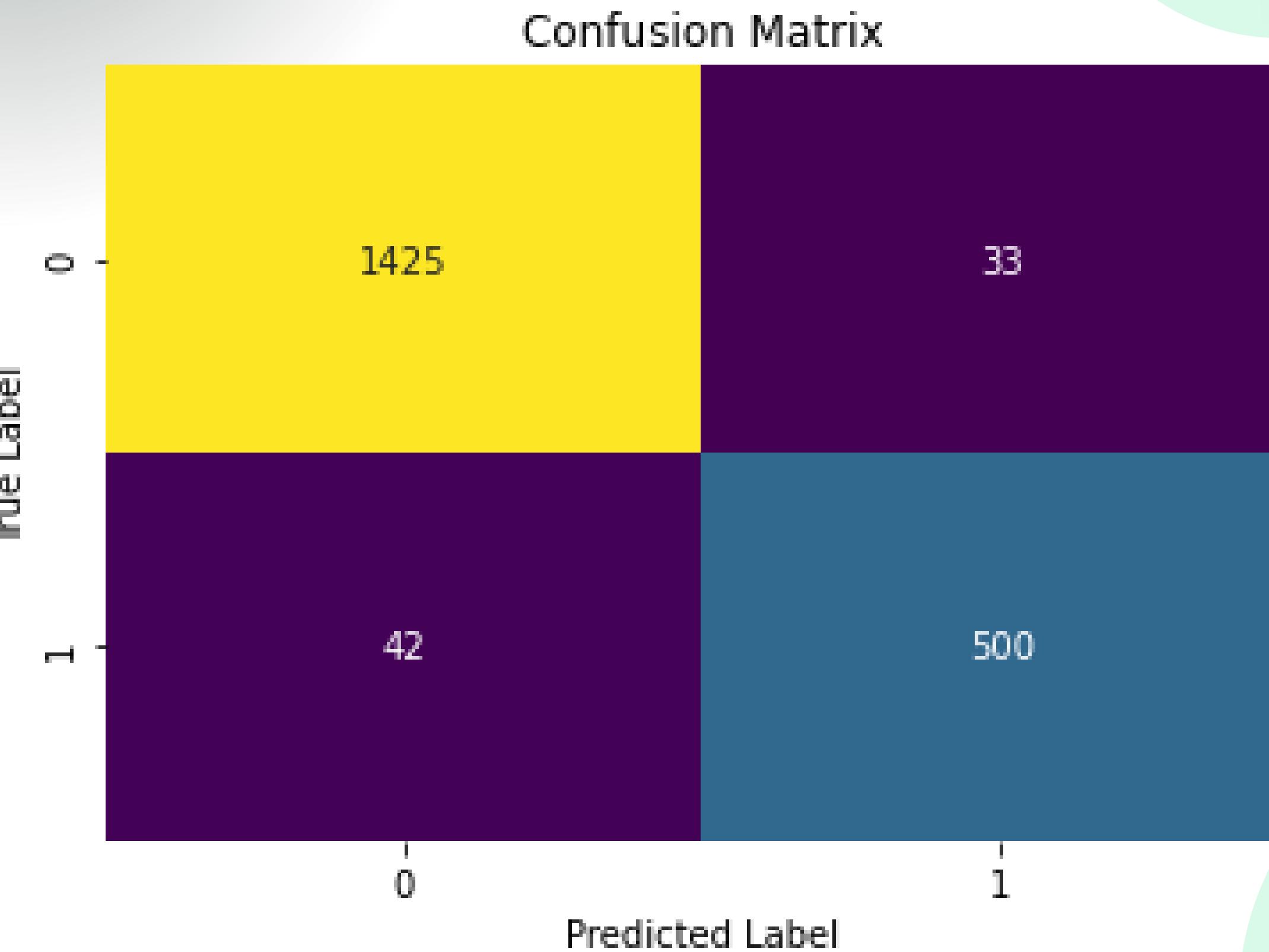
## Model Comparison



## Model Comparison Interpretation

- Best performer: XGBoost**
  - Near-perfect classification on both classes.
  - Excellent balance of precision and recall.
- Random Forest also performs very well, just slightly behind XGBoost
- SVM and MLP perform similarly, with very good results but not quite at XGBoost level.
- Logistic Regression is decent but with lower precision and recall for class 1

# CONFUSION MATRIX



## Confusion Matrix Findings

- True Negatives= 1425  
Correctly identified non-loan stackers
- True Positives= 500  
Correctly identified 497 loan stackers
- False Positives= 42  
Incorrectly flagged 45 safe borrowers as risky
- False Negatives= 33  
Missed 32 actual 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.



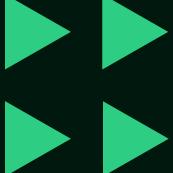
# RECOMMENDATIONS

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

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