“Predicting Barriers to Financial Inclusion Among Rural Youth in Kenya”

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Agenda:

- Business Understanding
- Objectives
- Exploratory Data Analysis (EDA)
- Data Preparation
- Modeling Approach & Performance
- Model Deployment
- Conclusion & Recommendation

Business Understanding

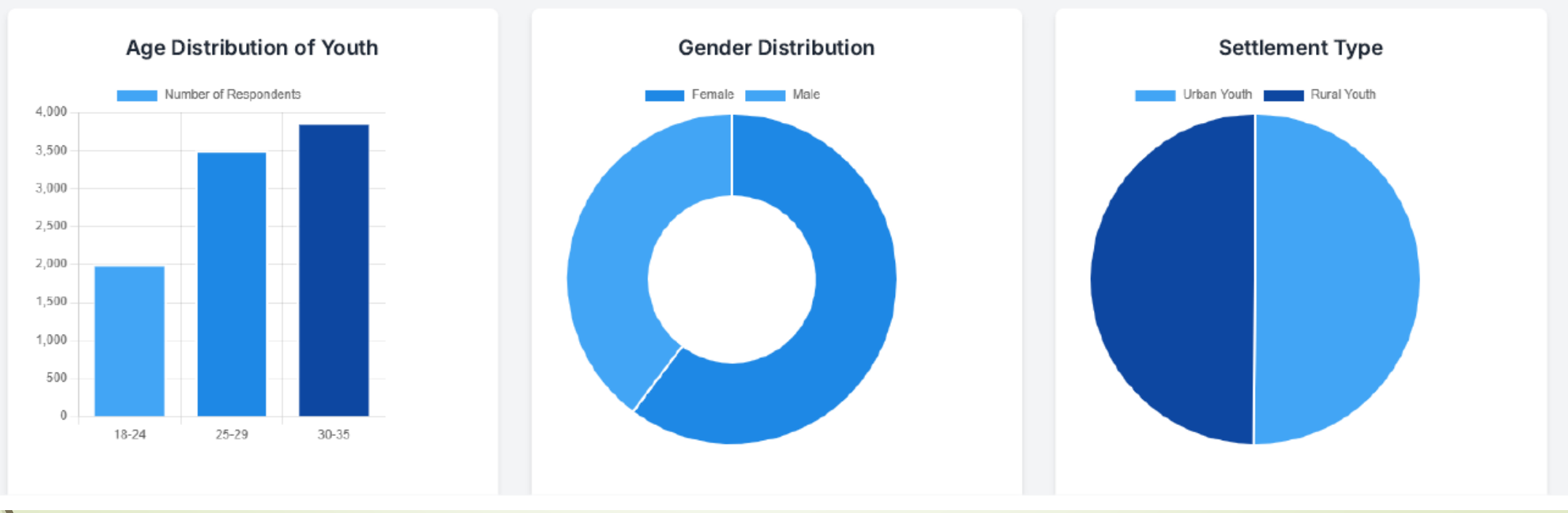
- Financial inclusion refers to the process of ensuring that individuals especially those in underserved or low-income areas have access to useful, affordable, and appropriate financial products and services delivered in a responsible and sustainable way.
- According to the (FinAccess, 2024) household survey, only 59% of youth are financially included in Kenya.
- Rural youth, aged 18-35,remain a key demographic facing disproportionate financial exclusion.
- The goal of this project is to identify and predict the key barriers to financial inclusion among rural youth (18–35 years) in Kenya, and to enable targeted policy and intervention strategies.

Objectives

- The objectives of the project include:
  - Identifying the key barriers to financial inclusion among the youth in rural Kenya.
  - Building a model for predicting financial inclusion
  - Generating insights that would be beneficial to the following stakeholders;
    - ✓ **Government** – in the design of targeted financial inclusion strategies & policy.
    - ✓ **Financial institutions** – in developing financial products that address existing gaps and to pre-screen/scoring for credit product eligibility.
    - ✓ **NGOs and donors** – in prioritizing areas of intervention.

Exploratory Data Analysis (EDA)

- ✓ **Data overview** – Source: FinAccess 2024 survey; (10,479 rows × 35 columns)
- ✓ **Key features** – age, gender, education, phone/ID access, expenditure.
- ✓ **Target:** – Financially Included (1) vs Not Financially Included (0)



Exploratory Data Analysis (EDA)… cont'd

Economic Realities and Digital Readiness

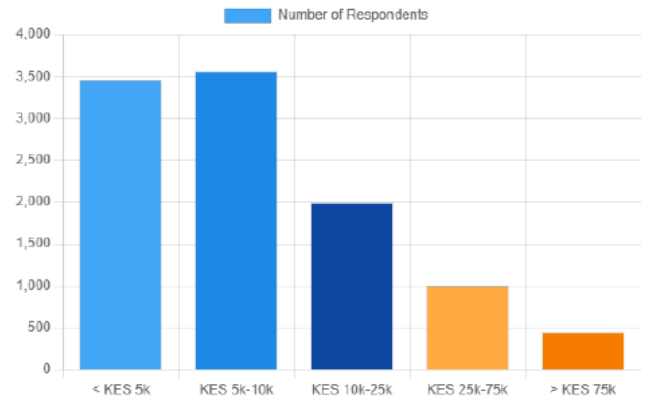
Economic status and digital capability are intertwined. High mobile penetration provides a foundation for digital services, but employment status and income levels dictate the ability to save, invest, and build financial resilience.

~18%
Self-Employed

~90%
Digitally Ready (Phone & ID)

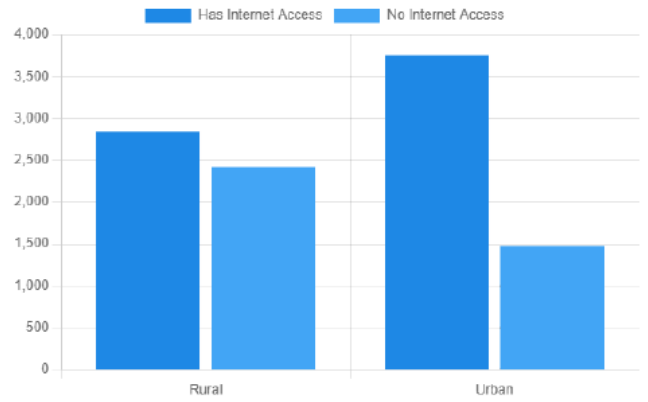
85%
Felt KES 500 Buys Less YoY

Monthly Expenditure Distribution



Monthly spending varies widely, with the majority of youth spending under KES 75,000. This indicates diverse economic capacities, requiring segmented financial products and services.

Internet Access by Settlement Type



Internet access is significantly higher in urban areas. This digital divide is a critical barrier, limiting access to online financial services and information for rural youth.

Data Preparation

Modeling

Models Built and Trained

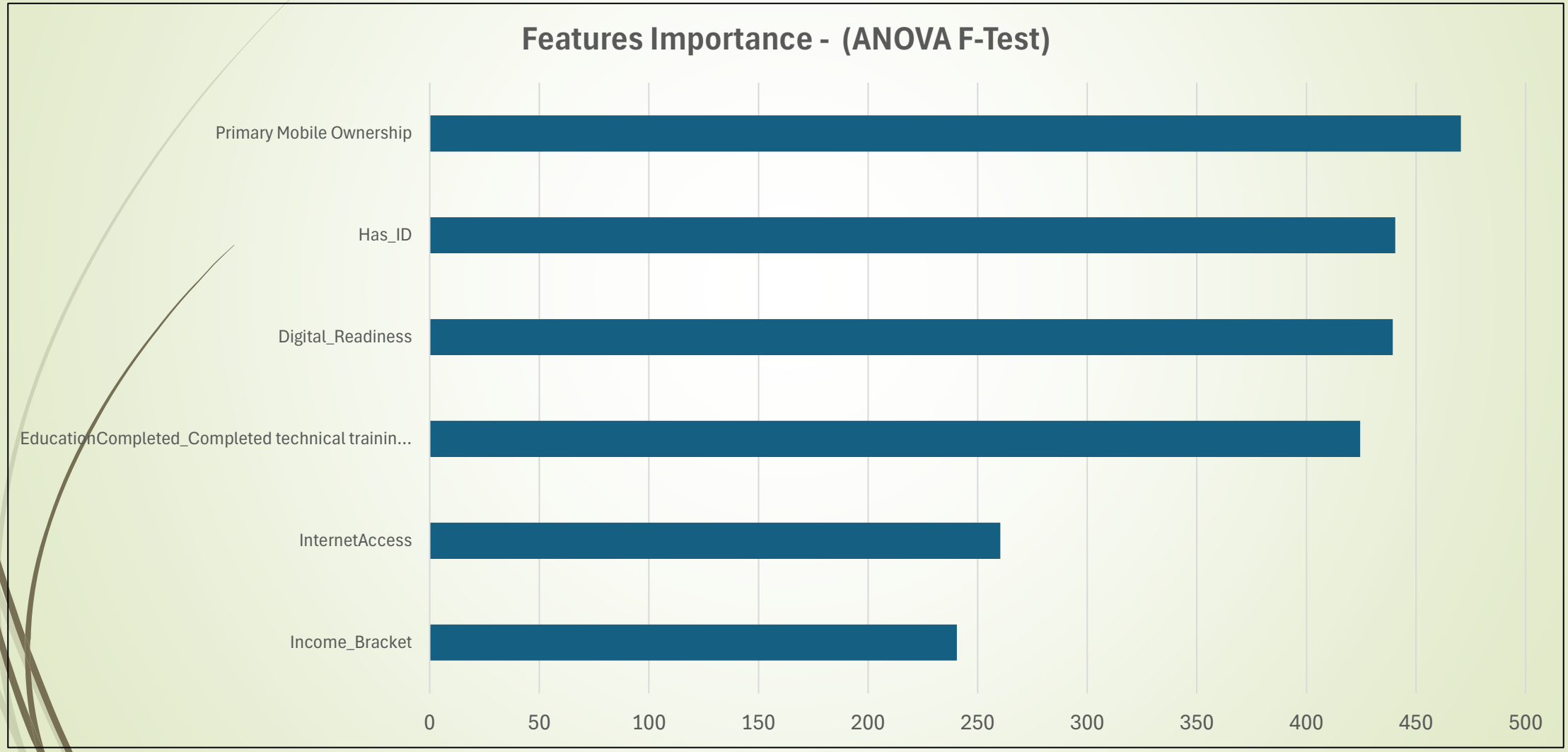
- Logistic Regression
- Random Forest
- Decision Tree
- XGBoost
- Gradient Boosting
- Naive Bayes

Model Selected

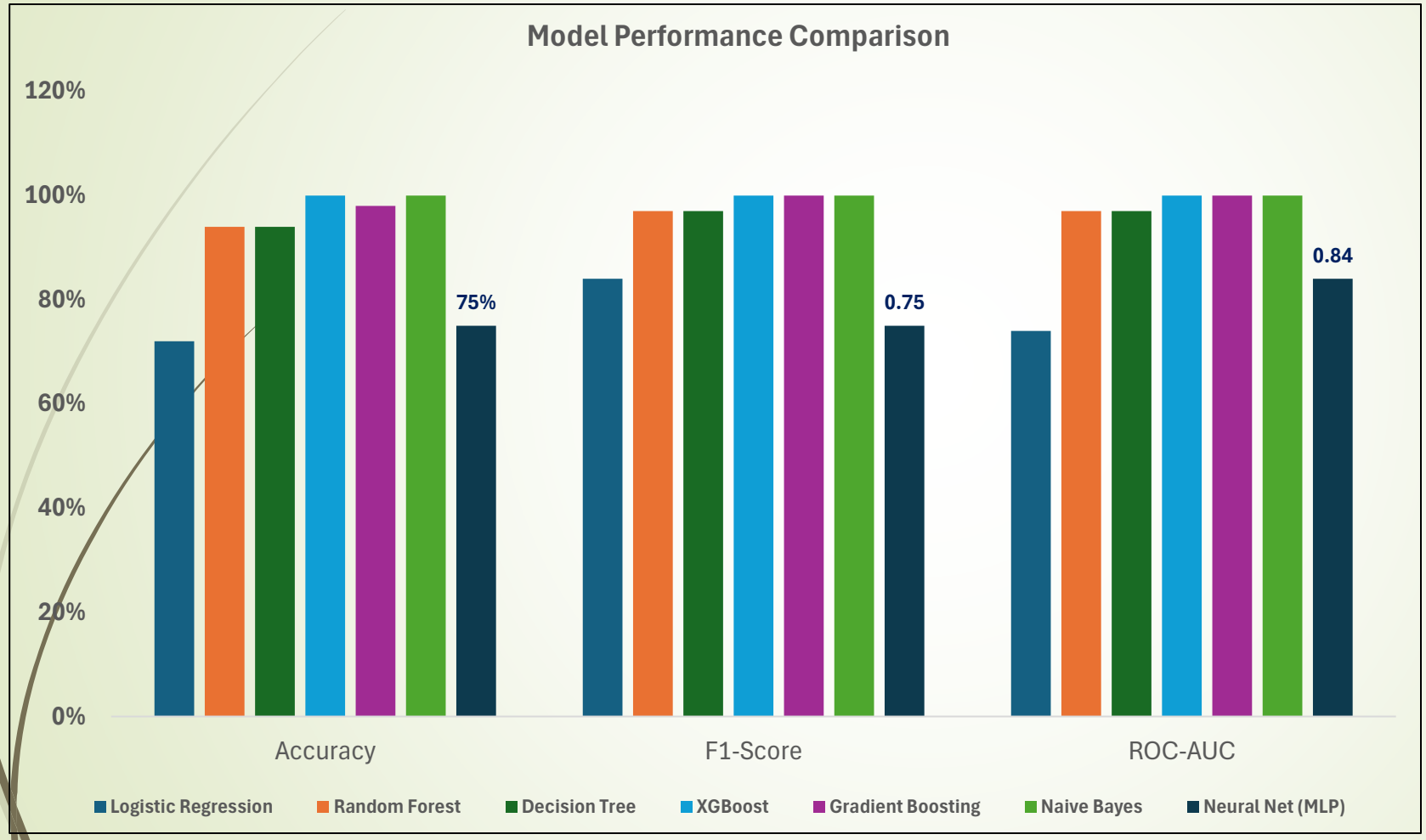
- Neural Net (MLP)

Reason for selection (diversity: interpretable + powerful)

Model – Features Importance



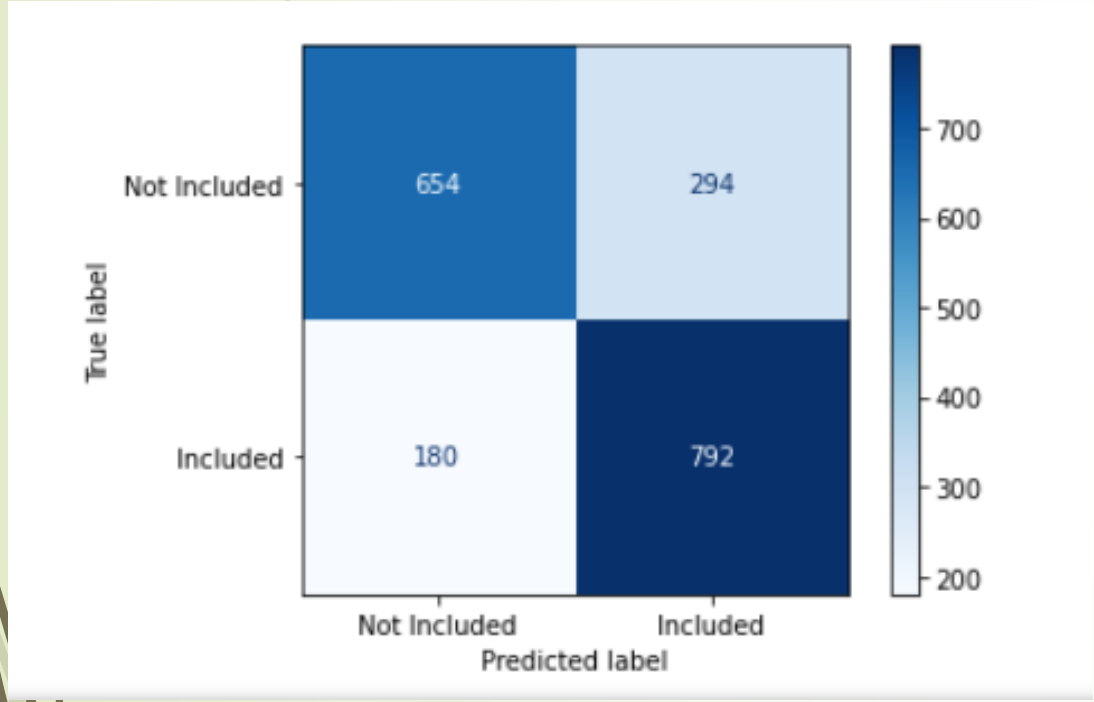
Model Performance

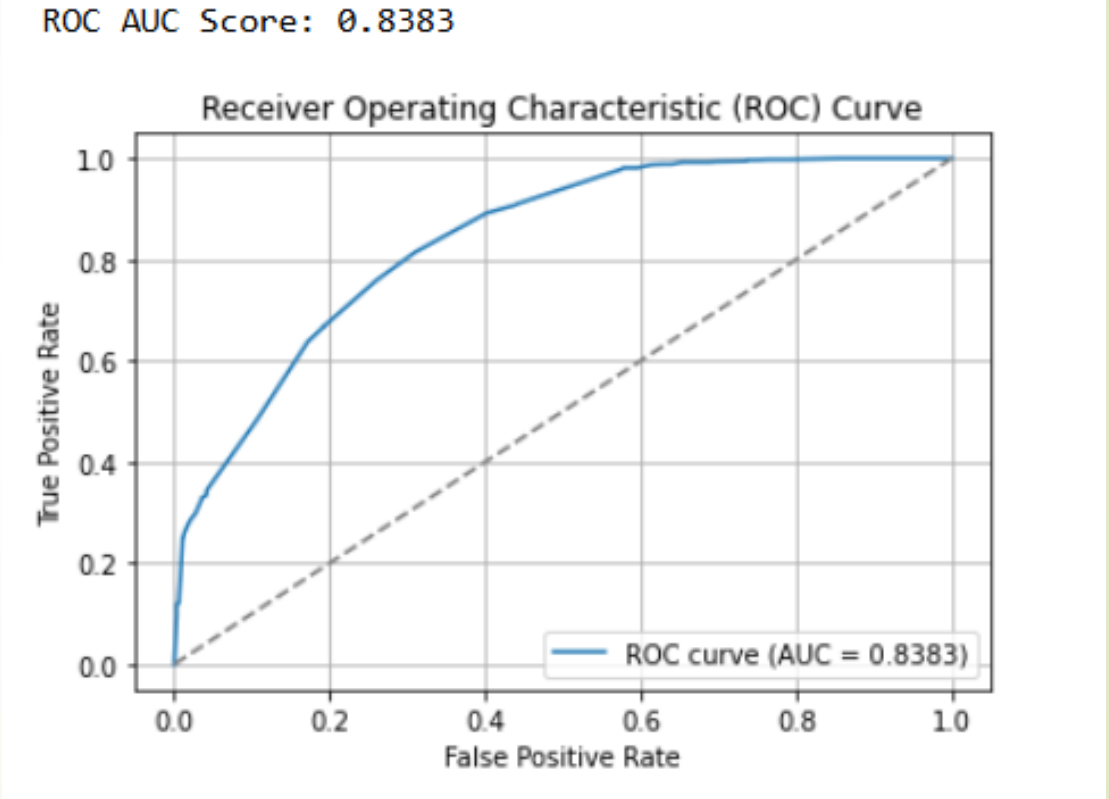


- *Models with extremely high performance have risk of overfitting and data leakage.*

Selected Model – Confusion Matrix, ROC

Confusion matrix

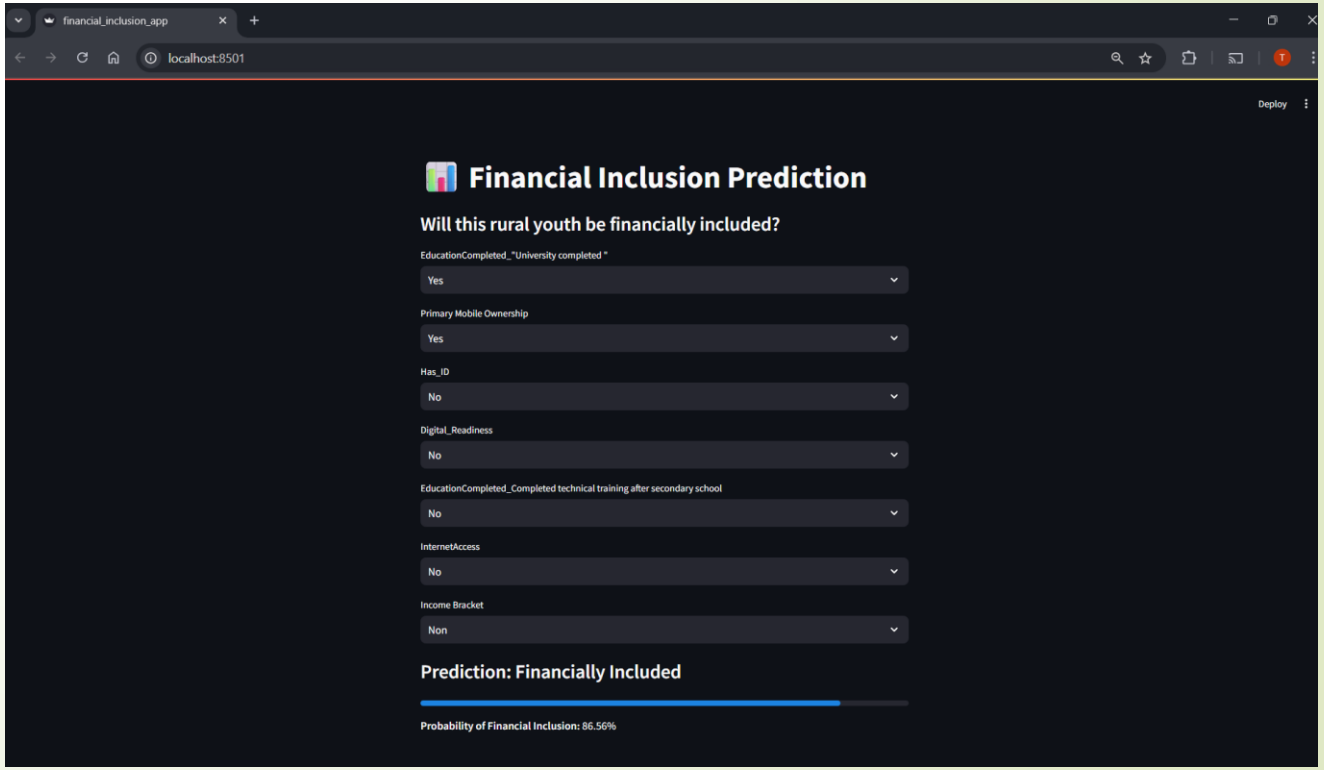




Model Deployment

- **Deployment App:** Streamlit API deployed on port 8501
- **Input:** 7 features
- **Output:** Prediction + probability
  - *Below is a screenshot of API working user interface*

Deployed App



Conclusion & Recommendations

Conclusion:

- MLP model is robust and provides a good balance across the classes.
- Financial inclusion of rural youth is predictable
- Targeted interventions such as digital access, education, IDs

Recommendations:

- Improve data coverage (geo-tags, telecom access)
- Deploy model in financial planning tools or gov dashboards
- Collect feedback from users to improve model accuracy

The End.....

Thank You!