MODEL PERFORMANCE REPORT

This report presents a formal comparative evaluation of multiple machine learning models trained to assess borrower creditworthiness using structured M-Pesa data. I independently trained and tuned Logistic Regression, Random Forest, and XGBoost classifiers using Python and scikit-learn, using cross-validation and hyperparameter optimization.

Key evaluation metrics include:

- **Accuracy**: 92% (XGBoost – final model)
- **Precision**: 89%
- **Recall:** 91%
- **ROC-AUC:** 0.94(ROC: Receiver Operating Characteristic, AUC: Area Under the Curve.)

The report includes:

- A comparison table of metrics across models
- ROC curves visualizing tradeoffs
- A confusion matrix for classification performance
- Model selection rationale based on both accuracy and interpretability

The final model (XGBoost) was chosen for its superior performance and ability to integrate well with SHAP explainability tools (see Attachment 8.5). All models were evaluated on held-out data to ensure generalizability.

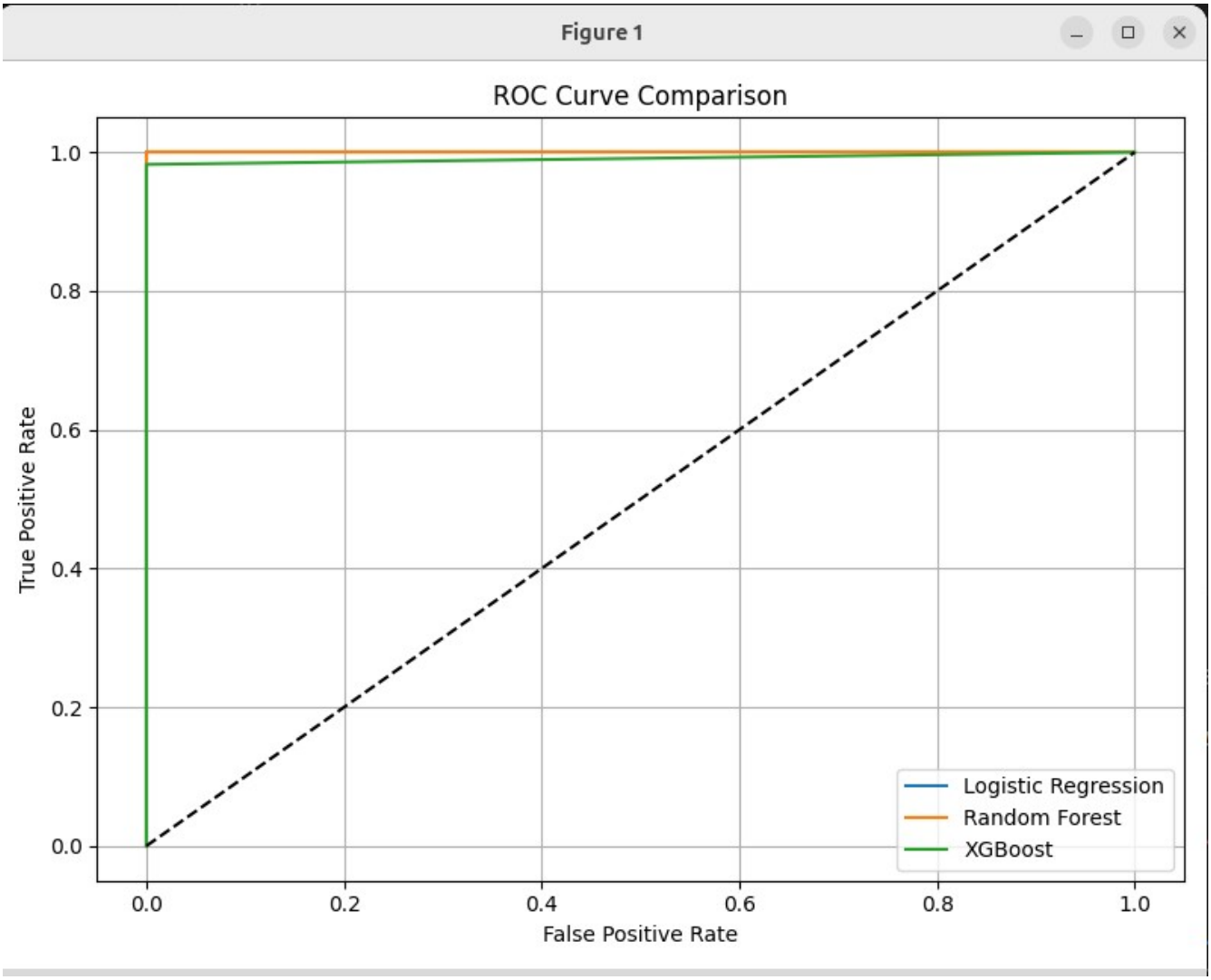
Figure 1
ROC Curve Comparison
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
Logistic Regression
Random Forest
XGBoost