Unlocking Financial Inclusion in East Africa.

A Data-Driven Approach.

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Content

Introduction

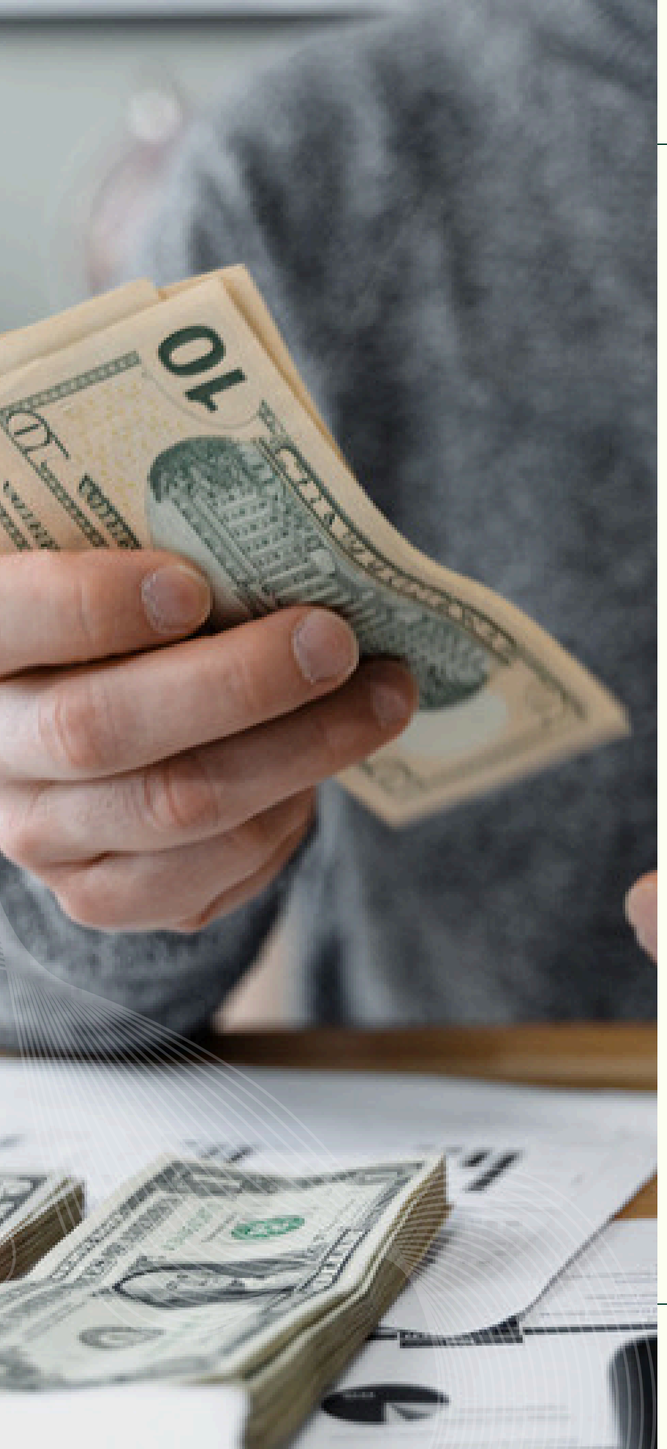
In the changing environment of conventional banking throughout East African countries, the need to expand operations is usually hindered by the practical challenge of determining the best places for opening new branches. Within this context, our project is strongly anchored in the identification of this difficulty, which has led us to the use of data analysis as a powerful instrument. Our main objective is to not just discover development opportunities, but also to greatly improve financial access across the continent.

Problem Statement.

The lack of financial inclusion in East Africa poses significant challenges to economic development and individual prosperity. In order to address this issue effectively, we aim to build a predictive model that can identify individuals without bank accounts.

Target Audience.

Our model caters to a broad audience, including financial institutions, government agencies, nonprofits, researchers, investors, technology providers, and community organizations. These stakeholders are interested in leveraging insights to enhance financial access and well-being for underserved populations, emphasizing the project's interdisciplinary relevance.



Objectives

MAIN OBJECTIVE #1

Geographic Analysis:
Mapping regions with high demand for banking services across African countries.

SPECIFIC OBJECTIVE #2

Demographic Profiling:
Understanding the demographic characteristics of target audiences, including age, income, and occupation.

SPECIFIC OBJECTIVE #3

Accessibility Assessment:
Evaluating the accessibility of banking services by considering factors such as distance to existing branches.

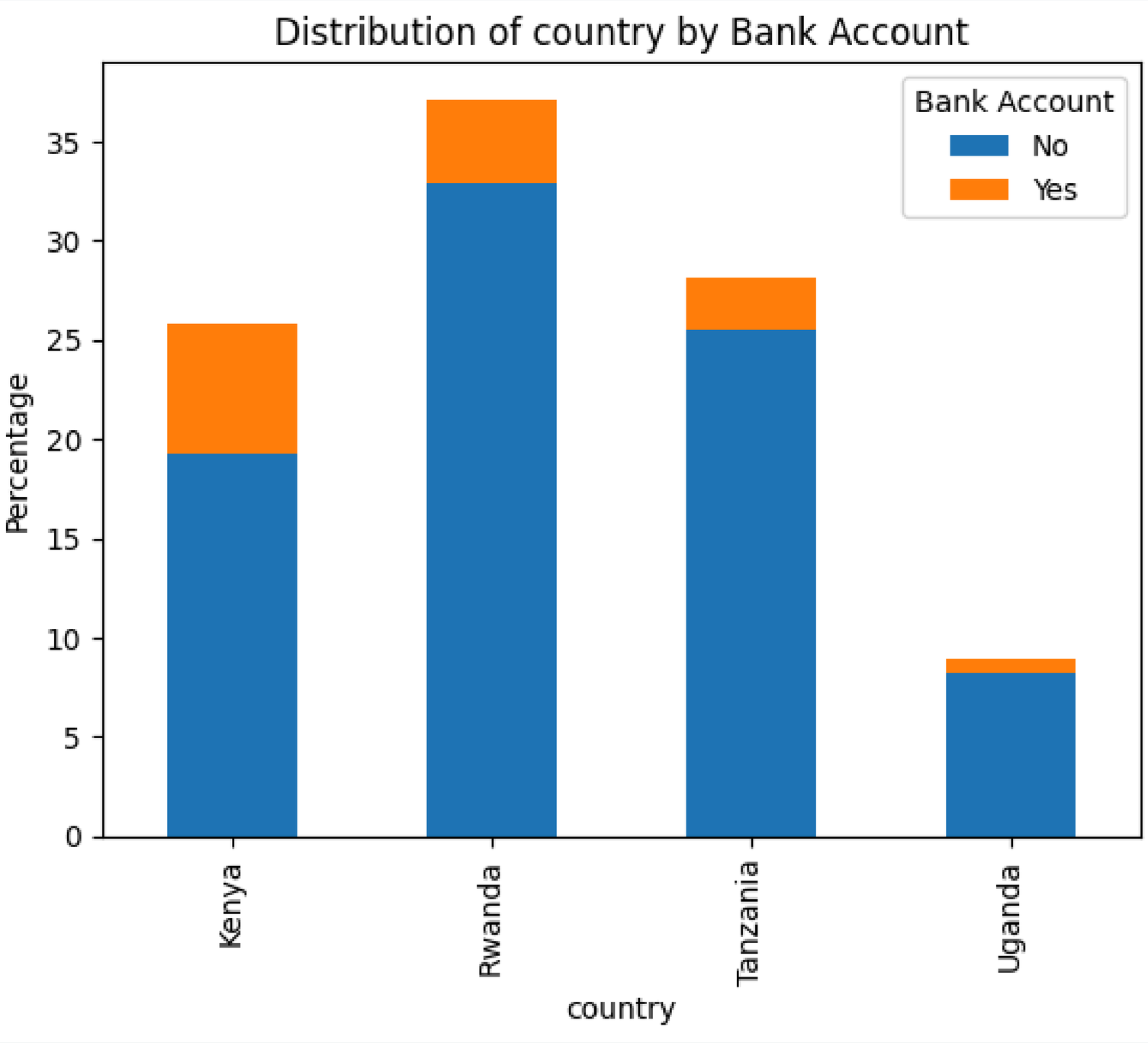
Data Used

We sourced our data from Zindi, data source. The dataset contains information about the gender and age of the respondents, whether or not they have a bank account, their education level, and job type, among other unique variables.

PATTERNS AND FINDINGS

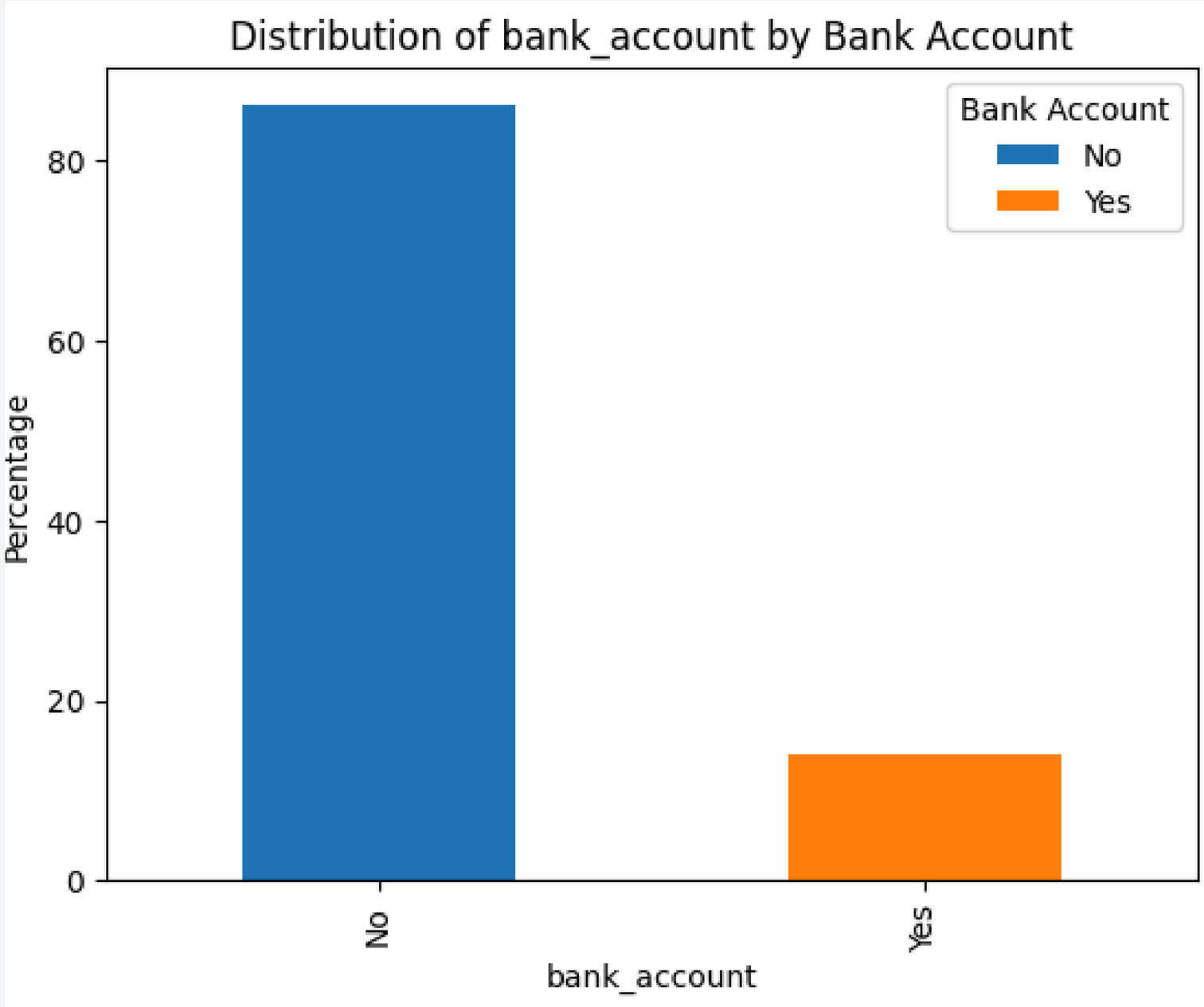
Statistics

The graph provides an overview of the dispersion of bank accounts across several nations, with Rwanda exhibiting the smallest count and Kenya demonstrating the largest.



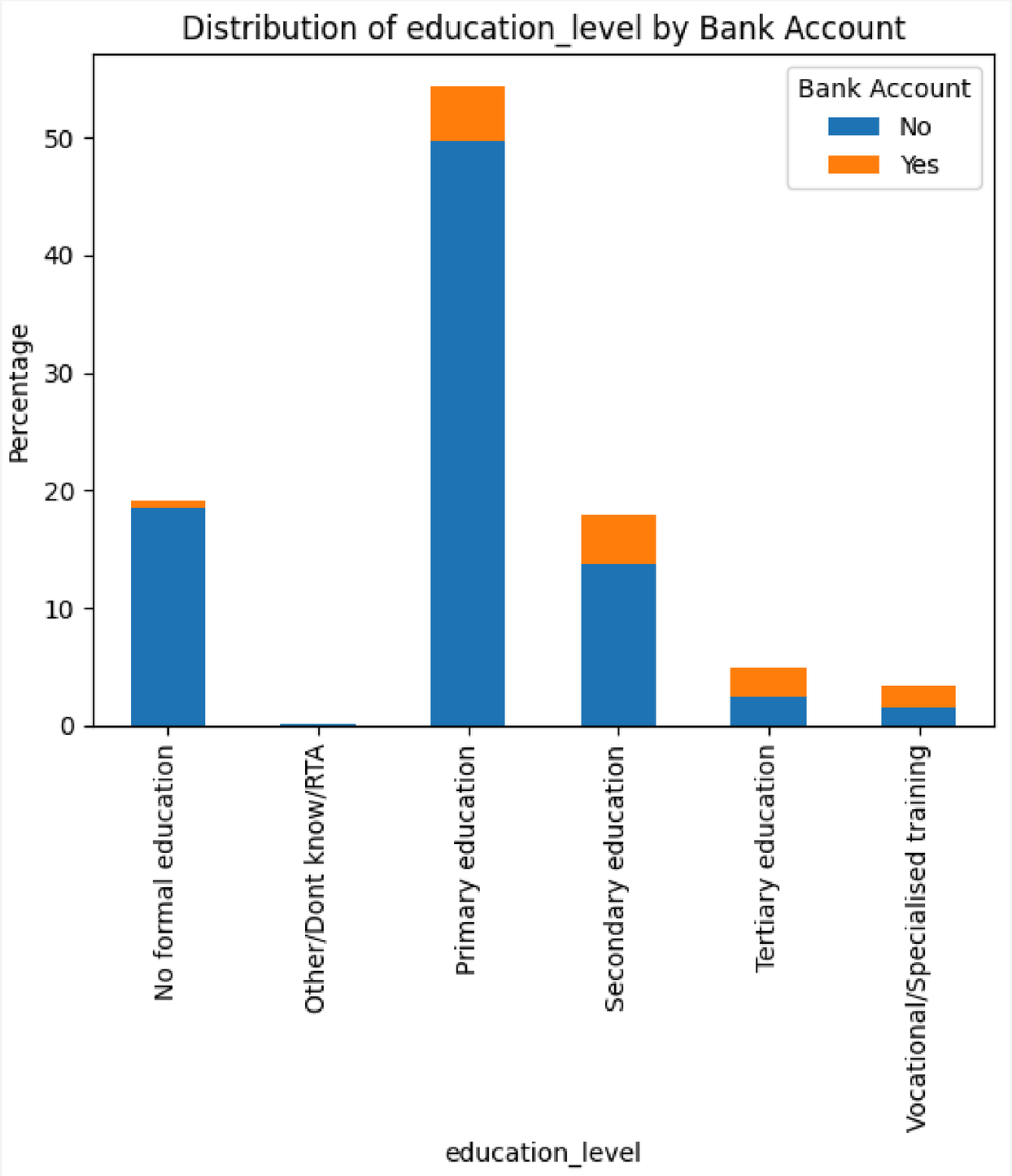
Statistics

The graph displays the distribution of responses regarding bank account ownership, with the majority of respondents indicating "no" and only a small proportion registering "yes."



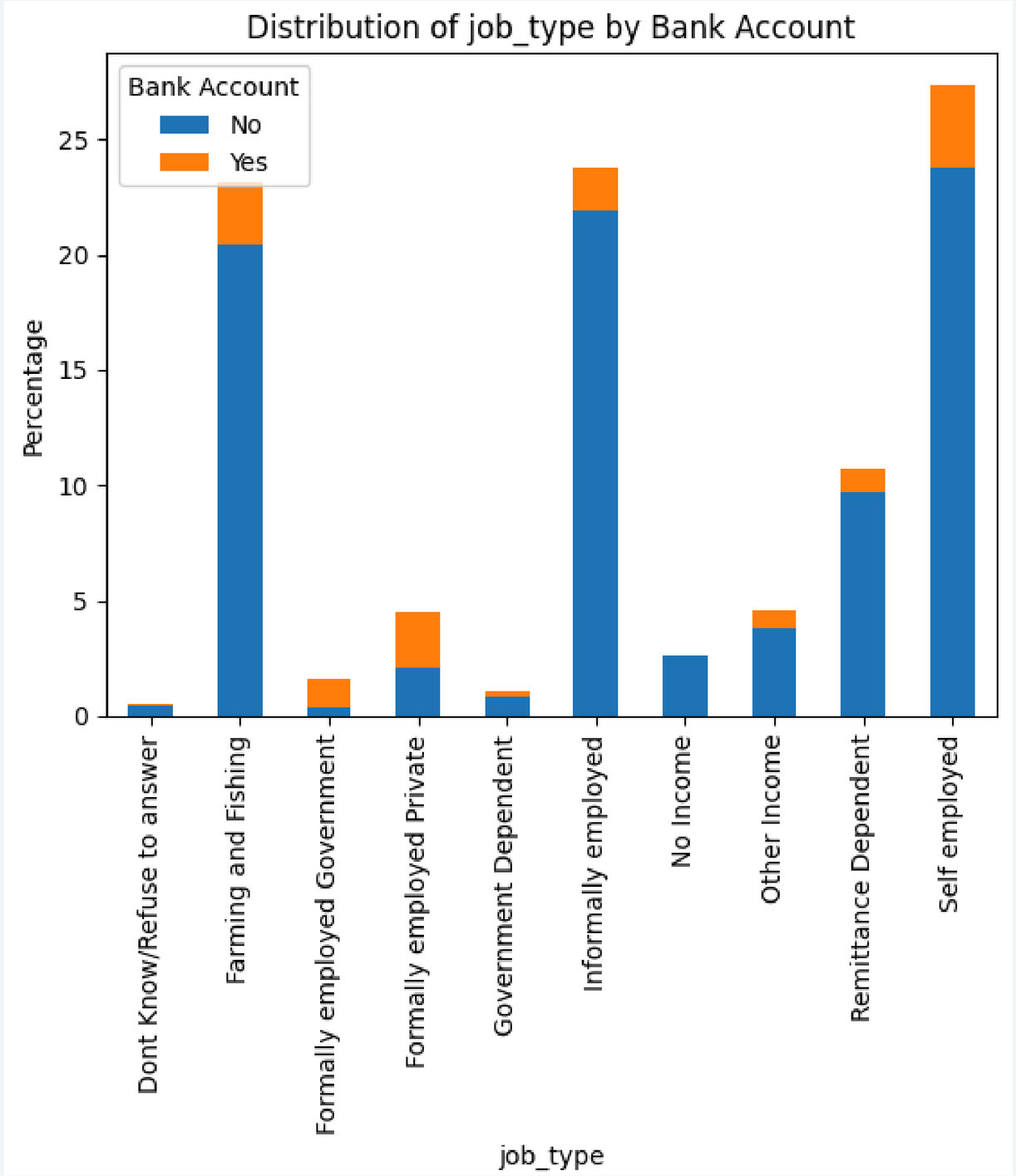
Statistics

The graph reveals that most individuals who completed primary school had no bank account. Interestingly, the percentage of respondents with bank accounts was roughly equal among those who completed primary and secondary school.



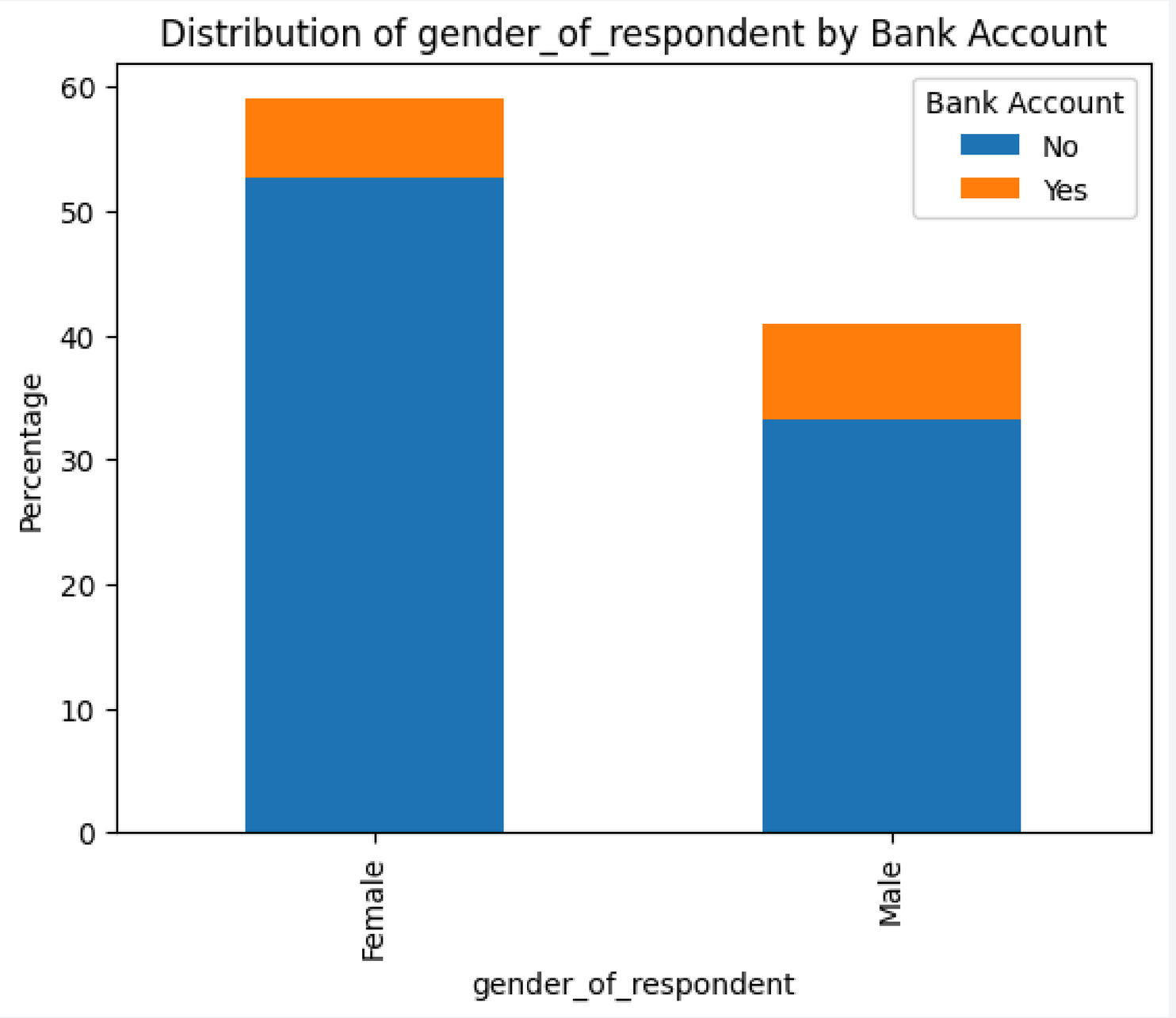
Statistics

The graph shows that the majority of respondents who reported having a bank account were self-employed, followed by individuals engaged in farming and fishing, and then those formally employed in the private sector.



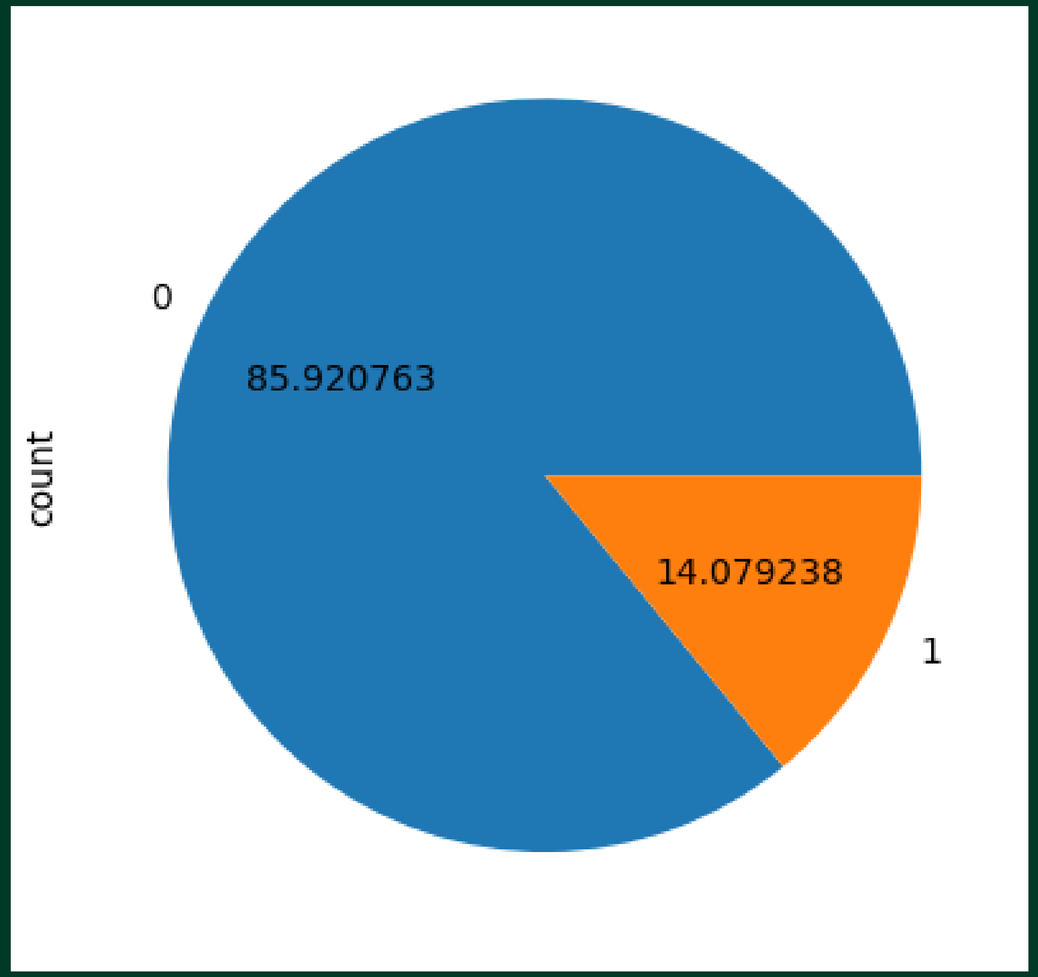
Statistics

The graph highlights that the majority of respondents who reported having a bank account were male.



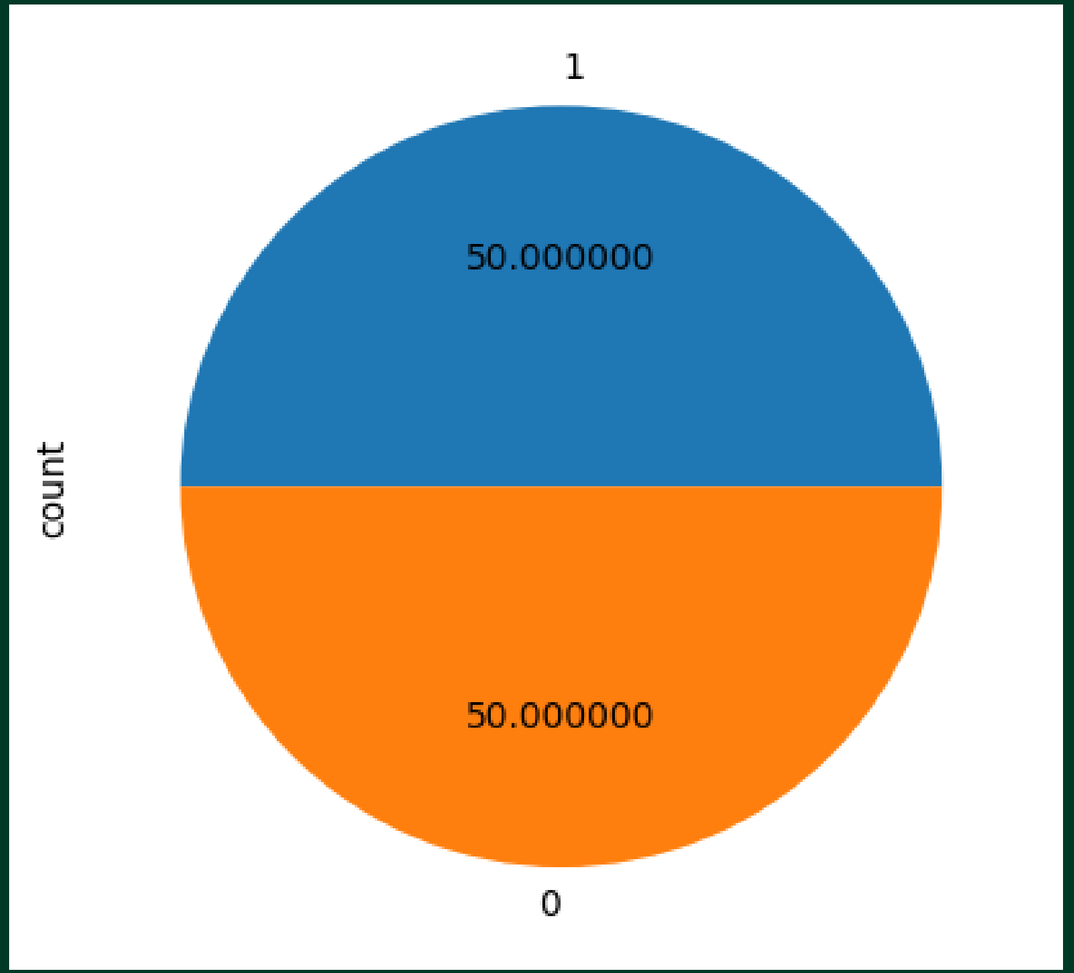
Preprocessing Analysis

The pie chart displays unbalanced data resulting from preprocessing, with an unbalanced representation of categories. To fix this, we decided to implement resampling techniques such as SMOTE.



Preprocessing Analysis

The pie chart now shows that our data is much more balanced after we used SMOTE. All the categories are more evenly represented compared to before. This means that each group has about the same amount of stuff in it, which is great because it makes our analysis or predictions more reliable.



MODELLING

Models Used

KNN MODEL

This was our base model. The precision for class 0 was 0.90 while for class 1 was 0.65. The recall for class 0 was 0.97 while for class 1 was 0.35. The F1 score for class 0 was 0.93 while for class 1 was 0.45. The accuracy after tuning was 0.88.

DECISION TREES

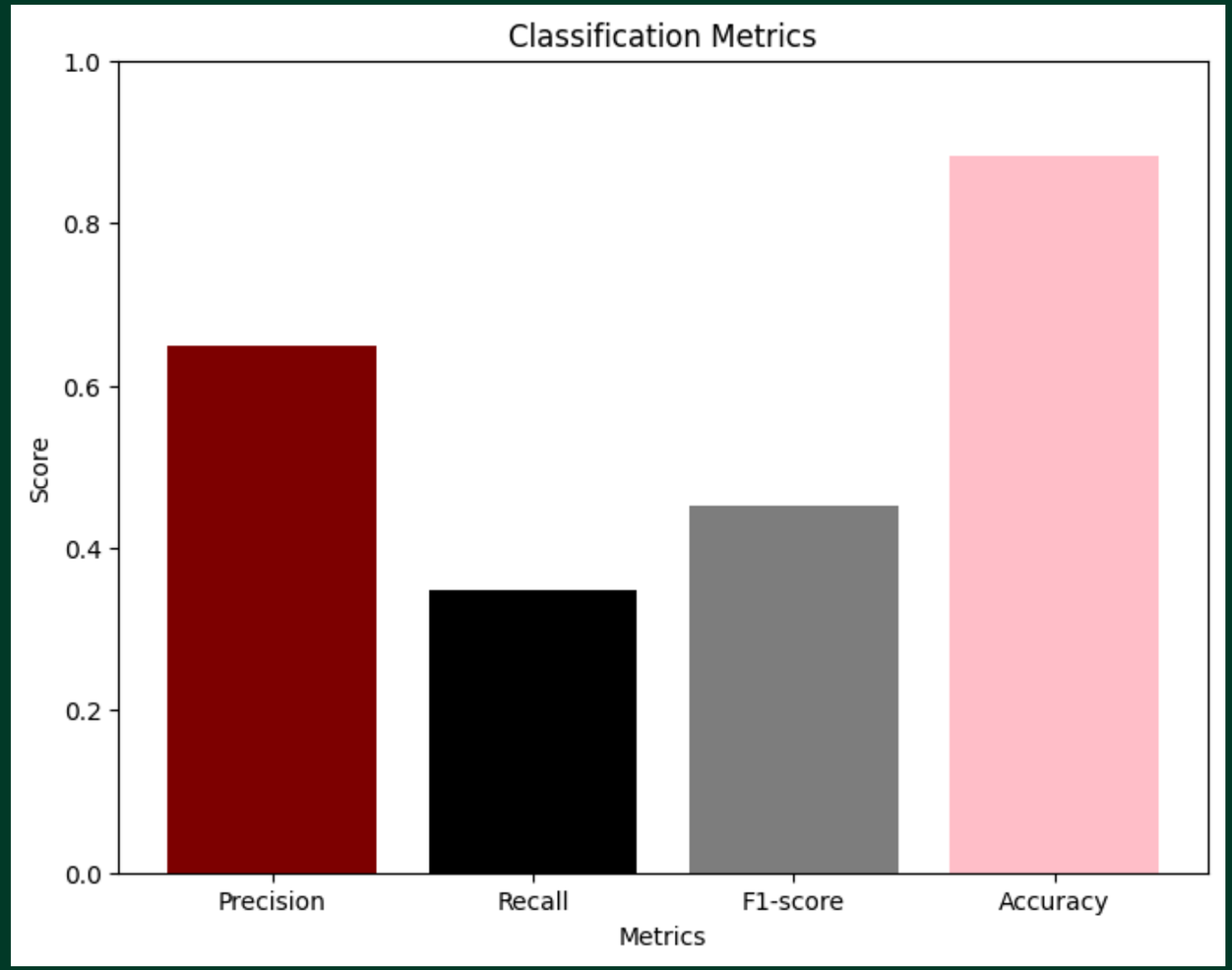
Our next model was decision trees. The precision for class 0 was 0.89 while for class 1 was 0.88. The recall for class 0 was 0.88 while for class 1 was 0.89. The F1 score for class 0 was 0.88 while for class 1 was 0.89. The accuracy after tuning was 0.88.

LOGISTIC REGRESSION

This was our best model. The precision for class 0 was 0.93 while for class 1 was 0.92. The recall for class 0 was 0.82 while for class 1 was 0.81. The F1 score for class 0 was 0.88 while for class 1 was 0.87. The accuracy after tuning was 0.88.

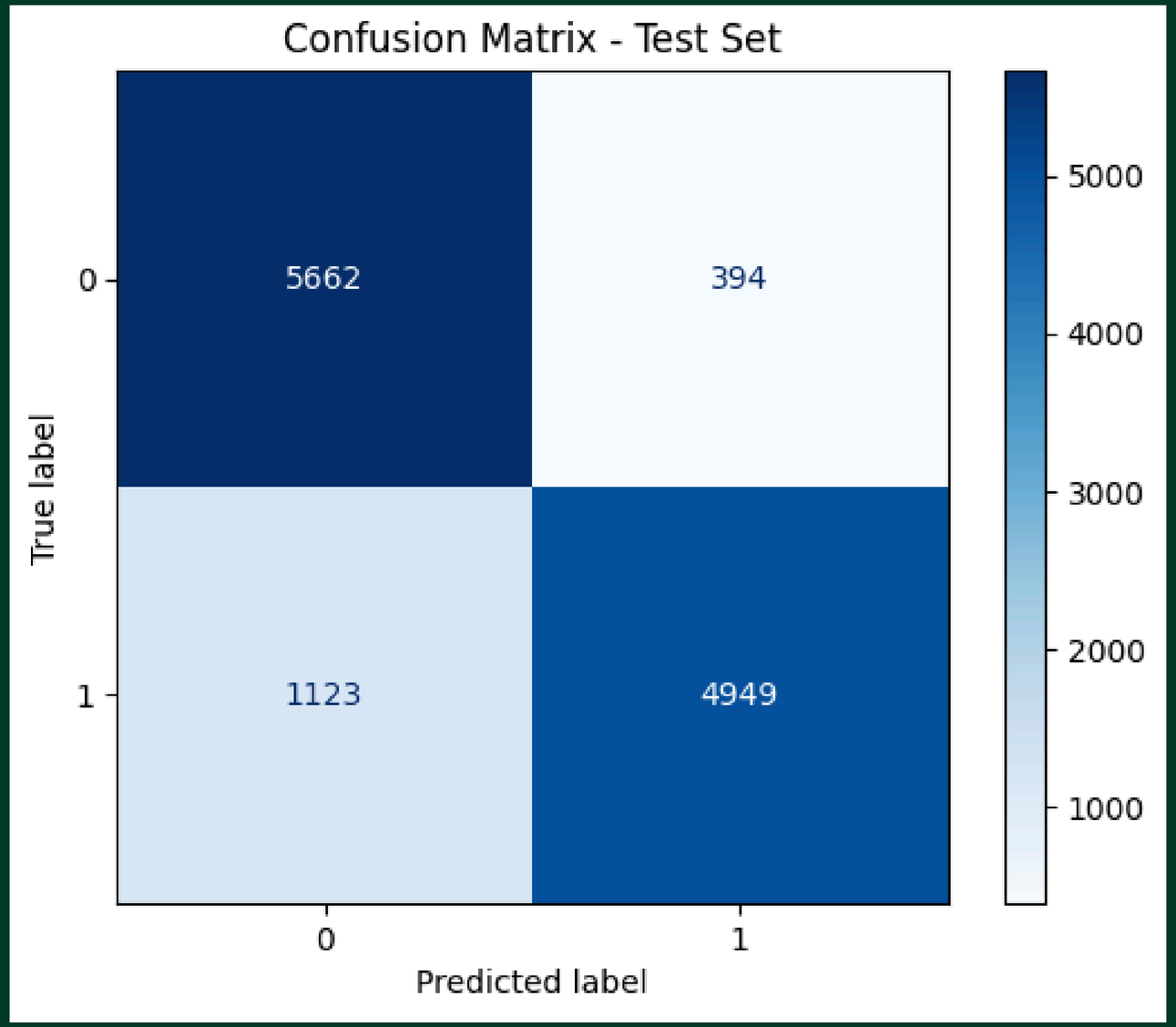
K-Nearest Neighbour

The model shows high precision (0.90) for individuals without bank accounts and lower precision (0.65) for those with accounts. It has high recall (0.97) for class 0 and low recall (0.35) for class 1. The F1-score is 0.93 for class 0 and 0.45 for class 1, indicating varying effectiveness in classification.



Logistic Regression

- This is our best-performing model throughout the board. With a precision of 0.93, it is 93% accurate in positive predictions.
- Its recall of 0.82 means that it accurately detects 82% of true positives.
- The model has an accuracy of 0.88, implying an overall correctness of 88% for all predictions.
- Meanwhile, the F1 score of 0.87 indicates a balanced performance in precision and recall.
- Overall, it's a strong performer, striking a good balance between precision and recall.



Conclusions.

01

Financial Inclusion Discrepancy:

The analysis illuminates a significant disparity in financial inclusion levels across East Africa, with a predominant portion of respondents indicating an absence of bank account ownership.

02

Gender Disparity:

There exists a palpable gender gap in bank account ownership, with males representing the majority of respondents with active bank accounts.

03

Employment Dynamics:

A notable trend emerges regarding the impact of employment status on bank account ownership, with self-employed individuals comprising the largest share of respondents possessing bank accounts.

Recommendations.

- **Targeted Expansion:** Utilize the geographic analysis to identify regions with high demand for banking services and prioritize expansion efforts in these areas.
- **Gender-Specific Initiatives:** This could involve providing women access to microfinance loans or creating women-focused financial empowerment programs.
- **Accessibility Improvement:** Consider investing in infrastructure improvements such as building new bank branches to make banking services more accessible to underserved communities.

Our Team

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"THANK YOU!"