

INSTITUT D'ENSEIGNEMENT SUPÉRIEUR DE RUHengeri

Accredited by Ministerial Order N° 005/2010/Mineduc of 16 June 2010



Scientia et Lux

FACULTY OF APPLIED FUNDAMENTAL SCIENCES

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Artificial Intelligence (AI)

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Musanze, February 2025

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Loan Eligibility Expert System - Testing Report

1. Introduction This report documents the development, testing, and user guide for the Loan Eligibility Expert System. The system is designed to evaluate small business loan applications based on key financial and operational criteria. It determines whether a business qualifies for a loan and, if so, under what conditions.

2. System Overview The system takes inputs such as revenue, business age, credit score, debt ratio, and collateral availability to assess eligibility using predefined rules. It provides a decision on whether the loan is approved or denied, along with a reason.

3. Testing Report The following table presents different test cases, expected outcomes, and actual results.

Test Case #	Revenue (RWF)	Business Age (Years)	Credit Score	Debt Ratio	Collateral	Existing Loans	Expected Result	Actual Result	Status (Pass /Fail)
1	600,000	3	80	0.35	Yes	No	Approved - High Limit	Loan Approved : Eligible for higher loan limit.	Pass
2	600,000	3	75	0.35	Yes	No	Approved - Limited	Loan Approved : Limited to 3M RWF.	Pass
3	400,000	3	80	0.35	Yes	No	Denied - Low Revenue	Loan Denied: Revenue is less than 500,000 RWF.	Pass
4	600,000	1	80	0.35	Yes	No	Denied - Short Business Age	Loan Denied: Business age is less than 2 years.	Pass
5	600,000	3	60	0.35	Yes	No	Denied - Low Credit Score	Loan Denied: Low credit score.	Pass
6	600,000	3	80	0.45	Yes	No	Denied - High	Loan Denied: High	Pass

							Debt Ratio	debt-to-income ratio.	
7	600,000	3	80	0.35	No	No	Denied - No Collateral	Loan Denied: No collateral available.	Pass

4. User Manual

4.1 How to Use the System

1. **Access the System:** Open the system through the provided GitHub Pages link or launch the Binder-hosted Python backend.
2. **Enter Business Information:** Input required details:
 - Business revenue (in RWF)
 - Business age (in years)
 - Credit score (0-100 scale)
 - Debt-to-income ratio
 - Collateral availability (Yes/No)
3. **Submit the Application:** Click the 'Submit' button to process the data.
4. **View the Results:** The system will analyze the inputs and display a loan decision:
 - 'Loan Approved: Eligible for higher loan limit.'
 - 'Loan Approved: Limited to 3M RWF.'
 - 'Loan Denied' with a specific reason (e.g., low revenue, low credit score, etc.).

4.2 Troubleshooting & Common Issues

- **Input Error:** Ensure all values are correctly entered before submitting.
- **Incorrect Decision:** Double-check the loan eligibility rules to ensure accuracy.
- **System Not Loading:** Ensure you have a stable internet connection and that GitHub Pages or Binder is running.

5. Conclusion & Recommendations

The Loan Eligibility Expert System functions as expected, correctly evaluating business loan applications. No issues were found, and no further modifications are needed at this stage. The system is now ready for deployment.

