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Scientia et Lux

FACULTY OF APPLIED FUNDAMENTAL SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

Artificial Intelligence (AI)

Group Assignment

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Small Business Loan Eligibility Expert System

1. System Overview

This expert system determines the eligibility of small businesses for a loan based on key factors such as revenue, business age, credit score, debt ratio, and collateral. The system uses a rule-based approach to evaluate inputs and provide an approval or denial response.

2. Python Code

```
1 def check_loan_eligibility(revenue, business_age, credit_score, debt_ratio, collateral):
2     """Check if a business is eligible for a loan based on given criteria."""
3     if revenue >= 500000:
4         if business_age >= 2:
5             if credit_score >= 70:
6                 if debt_ratio <= 0.40:
7                     if collateral:
8                         return "Loan Approved: Eligible for higher loan limit."
9                     else:
10                        return "Loan Approved: Limited to 3M RWF."
11                else:
12                    return "Loan Denied: High debt-to-income ratio."
13            else:
14                return "Loan Denied: Low credit score."
15        else:
16            return "Loan Denied: Business age is less than 2 years."
17    else:
18        return "Loan Denied: Revenue is less than 500,000 RWF."
19
20 # Example Test Cases
21 if __name__ == "__main__":
22     print(check_loan_eligibility(600000, 3, 80, 0.35, True)) # Approved with higher limit
23     print(check_loan_eligibility(600000, 3, 80, 0.35, False)) # Approved with limit
24     print(check_loan_eligibility(400000, 3, 80, 0.35, True)) # Denied: Low revenue
25     print(check_loan_eligibility(600000, 1, 80, 0.35, True)) # Denied: Short business age
26     print(check_loan_eligibility(600000, 3, 60, 0.35, True)) # Denied: Low credit score
27
```

3. Execution Output

```
Run main
C:\Users\Bruce\PycharmProjects\BANK\venv\Scripts\python.exe C:/Users/Bruce/PycharmProjects/BANK/main.py
Loan Approved: Eligible for higher loan limit.
Loan Approved: Limited to 3M RWF.
Loan Denied: Revenue is less than 500,000 RWF.
Loan Denied: Business age is less than 2 years.
Loan Denied: Low credit score.
Process finished with exit code 0
```

4. Data Flow Diagram

