PROJECT 1

Presentaion tips

-Problem Statement

-Progress report at the end of slide

-limitations\*

-test case scenario

-explain algorithm used

Development and Deployment of an Advanced AI-Driven Loan Approval System, Competing with Leading Platforms such as DataRobot, Zest AI, and Underwrite.AI.

3 main components

Frontend(html, css,javascript)

Backend(server aspect)??

Ai algorithm ???

-Concept

1. Understanding how loans work ,and their importance

2. Understanding the loan approval process (Based on what the loan is for, duration of loan agreement)

3. Conditions for loan to be approved or rejected. Determine core factors for either

4. Training model based on dataset to determine loan approval credibility

5. Countries that are similar to nigeria (economically, size, output, resources) but have an effective loan/credit system

6. Understand the nigeria loan system and apply such?

**LOAN SYSTEM**

\*Consider local and international applicants depending on the location where the loan is being applied from to adhere to local policy.

- Determine high risk – loan risk granting.

- Personal or Business loan.

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Eligibility and Requirements(Based on personal loan for )

\*features of dataset

1. Establish Age Ranges
2. Loan Amount(Min – Max based on employer and income)
3. Put forward a required minimum steady income amount
4. Place of employment has to be in a pre-approved list of companies
5. Bank statements and payslips(Min of past 3 – 6 months)
6. \*Letter of Awareness from employer to domicile your salary
7. Establish interest rate based on amount borrowed and duration for repayment.
8. Interest rate, repayment period, and amount will change based on the purpose/intent for loan use (home purchase, car purchase, travel, medical, financial flotation)

The implementation of artificial intelligence (AI) and machine learning (ML) in the loan processing industry is

expected to significantly transform the way loans are approved, underwritten, and managed. Here are some potential

changes that may shape the future of the loan process:

1. Automated decision-making: AI/ML algorithms can analyze a vast amount of data much faster and more accurately

than humans, enabling real-time credit decisions without manual intervention. This will lead to faster loan

approval times and reduced risk of human bias in decision-making.

2. Enhanced fraud detection: ML models can detect fraudulent activities such as identity theft and credit card

scams more effectively than traditional methods, reducing the risk of fraudulent loans.

3. Personalized loan offers: AI/ML algorithms can analyze a borrower's financial data, credit score, income, and

other factors to provide personalized loan offers tailored to their specific needs. This can lead to higher

approval rates and increased customer satisfaction.

4. Streamlined application process: AI-powered chatbots and virtual assistants can guide borrowers through the

loan application process, reducing the need for manual intervention and minimizing errors.

5. Increased accuracy in credit scoring: ML algorithms can analyze a borrower's credit history and identify

patterns that may not be captured by traditional credit scoring models, leading to more accurate credit scores and

reduced risk of default.

6. Improved risk management: AI/ML can help lenders identify potential risks associated with individual borrowers

or loans, allowing them to take preventive measures to mitigate those risks.

7. Enhanced customer experience: AI-powered tools can provide personalized recommendations and offers to borrowers

based on their financial goals and preferences, improving the overall loan processing experience.

8. Increased efficiency in document collection: AI-driven systems can automate the process of collecting and

verifying borrower documents, reducing manual effort and minimizing errors.

9. Better portfolio management: ML algorithms can analyze a lender's entire portfolio to identify trends,

patterns, and potential risks, allowing them to make more informed decisions about loan origination, risk

assessment, and collections.

10. Increased accessibility: AI/ML-powered platforms can provide loan processing services to underserved

communities or those who have limited access to traditional banking services, promoting financial inclusion.

11. Dynamic pricing: ML algorithms can analyze market trends and adjust interest rates and fees in real-time,

providing borrowers with more competitive loan offers based on their creditworthiness.

12. Fraud detection and prevention: AI/ML models can monitor loan applications and detect potential fraudulent

activities, reducing the risk of fraud and improving overall security.

13. Loan servicing optimization: ML algorithms can analyze borrower data to optimize loan servicing operations,

such as payment processing, account management, and collections.

14. Customer segmentation: AI/ML models can group borrowers based on their financial behavior and preferences,

allowing lenders to tailor their marketing and sales strategies for specific customer segments.

15. Regulatory compliance: ML algorithms can analyze loan processing data to identify potential regulatory

violations and provide recommendations for compliance, reducing the risk of legal penalties.

While AI/ML will undoubtedly bring significant changes to the loan process, it is essential to recognize that

these technologies are not a replacement for human judgment and oversight. Human involvement will still be

necessary to ensure fairness, transparency, and accountability in the lending process.

|  |  |
| --- | --- |
| High Risk Loan | Low Risk Loan |
| 1. Little to no upfront collateral needed | Some form of collateral will be needed depending on loan purpose |
| 1. Higher interest rate | \*Lower interest rate |
| 1. Shorter, strict repayment period | Flexible, longer repayment period |
|  |  |
|  |  |

**Loan policy:**

**Loan risk rating:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Risk Rating Category** | **Internal Credit Scoring/Rating** | **Mid Point Weight** | **Exposure(E)**  **in billions** | **% of Total portfolio** | **Weighted Risk (WR)** |
| Extremely low risk | AAA | 1.5 |  |  |  |
| Very low risk | AA | 2.5 |  |  |  |
| Low risk | A | 3.5 |  |  |  |
| Acceptable risk | BBB | 4.5 |  |  |  |
| Moderately High risk | BB | 5.5 |  |  |  |
| High risk | B | 6.5 |  |  |  |
| Very high risk | CCC | 7.5 |  |  |  |
| Extremely high risk | CC | 8.5 |  |  |  |
| High likelihood of default | C | 9.5 |  |  |  |
| **\*\*\*Unrated Portfolio** |  |  |  |  |  |
| - Core Consumer | BB | 5.5 |  |  |  |
| - Others | B | 6.5 |  |  |  |
| **Total** |  | 61.5 |  |  |  |

**\*\*\*Unrated credits should not be assigned a rating higher than BB or 5.5 points.**

**Loan risk rating terms:**

**Mid Point Weight:**

The Mid Point Weight is a value assigned to a specific risk category or rating. It represents the midpoint or average of the range of weights assigned to different risk categories. These weights are often determined based on factors such as the probability of default, loss given default, and other relevant risk parameters. The Mid Point Weight serves as a benchmark for comparing the risk associated with different loans or the overall loan portfolio.

Risk weight ranges are categories that reflect the creditworthiness of borrowers associated with a particular loan grade (e.g., A, B, C, D, E). Higher grades (A) typically have lower risk weights, indicating a lower chance of default. The mid point weight is calculated by averaging the minimum and maximum values within a risk weight range for a loan grade. For instance, if the risk weight range for grade B is 0.05 to 0.10, the mid point weight would be (0.05 + 0.10) / 2 = 0.075.

**Exposure (E) in billions:**

Exposure refers to the total amount of funds at risk in a loan or a portfolio of loans. This can be expressed in monetary terms, and the "in billions" indicates that the exposure is measured in billions of currency units (e.g., dollars, euros). It represents the potential loss that could occur if the borrower defaults or if adverse economic conditions impact the loan. This reflects the lender's financial commitment to that particular segment of borrowers. Higher exposure indicates a greater potential loss if defaults occur within that category.

**% of Total Portfolio:**

This term represents the proportion of the total loan portfolio that is attributed to a specific loan or a group of loans. It is expressed as a percentage and helps in understanding the relative size of a particular loan or group of loans within the entire portfolio. This metric is important for portfolio management and risk assessment, as it allows lenders to gauge the impact of a potential default or adverse event on the overall portfolio.

It helps assess the lender's overall risk profile by showing the concentration of loans in different risk categories. A high percentage in a lower-rated (higher risk) category suggests a more significant risk exposure for the lender.

**Weighted Risk (WR):**

The Weighted Risk is a measure that combines the Mid Point Weight and the Exposure of a loan or a group of loans. It is calculated by multiplying the Mid Point Weight by the Exposure. This provides a quantitative assessment of the potential risk associated with a specific loan or the entire portfolio. Weighted Risk is valuable for prioritizing risk management efforts and allocating resources based on the relative importance of different loans in the portfolio.

Captures the combined effect of a loan grade's creditworthiness (reflected by the mid point weight) and the total loan amount outstanding (exposure) for that grade.

It's calculated by multiplying the mid point weight by the exposure (E) in billions:

**WR = Mid Point Weight \* E.**

Weighted risk provides a more comprehensive risk assessment by considering both the inherent risk of the loan grade and the lender's financial commitment to that category. Loan grades with higher mid point weights and larger exposures will contribute more to the overall weighted risk of the portfolio.