UE22CS341A: Software Engineering

Deliverable - 2

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Credit Score Based Loan Recommendation System

DESIGN (ARCHITECTURE DOCUMENT)

1. Introduction

- **Purpose**: The purpose of the "Credit Score-Based Loan Matching System" is to streamline and automate the traditional loan approval process, which is often manual, slow, and prone to errors. By leveraging credit scores and financial metrics, the system aims to improve the accuracy and efficiency of borrower-lender matching, reducing risks for lenders while enhancing accessibility for borrowers.
- **Scope**: This platform addresses the inefficiencies in traditional loan approval systems by automating risk assessments, interest rate calculations, and borrower-lender matchmaking. The scope includes static financial data processing, regulatory compliance, and delivering an intuitive user interface for both borrowers and lenders.
- **Definitions, Acronyms, and Abbreviations**: Include terms such as "Credit Score," "Loan Approval Process," "GDPR," "KYC/AML," "Risk Assessment," and "FinTech."

- **References**: Reference the literature related to credit scoring systems, algorithms like FICO, and the importance of financial inclusivity through technology.

2. Architectural Representation

- Present the overall system architecture. Since you're using a microservices-based approach (as described in your methodology), you could outline the architecture, illustrating how each service (risk assessment, interest rate calculation, etc.) interacts with others, such as the user interface and database components.

3. Architectural Goals and Constraints

- **Goals**:
    - Automate risk assessments and loan matchmaking based on borrower credit scores and financial data.
    - Provide personalized loan offers using dynamic interest rate models.
    - Ensure a scalable and robust system capable of processing increasing loan applications.
    - Adhere to financial regulations such as GDPR, KYC, and AML.
- **Constraints**:
    - Operate with static, non-real-time financial data to ensure stability.
    - Compliance with regional data protection laws.
    - Scalability to handle growing user bases and loan requests.

4. Use-Case View

- **Architecturally-Significant Use Cases**:
    - Loan Processing: Automate the evaluation of credit scores and match borrowers with lenders based on risk profiles.
    - Interest Rate Calculation: Dynamic calculation of personalized interest rates for borrowers.
    - Loan Approval: Finalize and approve loan applications based on lender preferences and borrower profiles.

5. Logical View

- **Architecture Overview – Package and Subsystem Layering**:
    - This can illustrate how different system components (risk assessment algorithms, credit score analysis, UI, etc.) interact with each other. The layers might include:
        - User Interface Layer: Web portals for borrowers and lenders.
        - Business Logic Layer: Risk assessment, matchmaking, and interest rate calculation services.
        - Data Layer: Storage for borrower credit scores, loan details, and lender preferences.

6. Process View

- **Processes**:
    - Describe the main processes such as:
        1. Borrower data collection and credit score analysis.
        2. Loan matchmaking algorithm processes to pair borrowers with suitable lenders.
        3. Interest rate determination process based on risk profiles.
        4. Regulatory and compliance processes to ensure adherence to GDPR and KYC/AML standards.
- **Process to Design Elements**:
    - Map the processes to design elements in the system, such as how the credit scoring algorithm ties into the risk assessment module or how the user interface interacts with the underlying matchmaking algorithm.
- **Model Dependencies**:
    - Highlight dependencies between different models such as the credit scoring model, the borrower-lender matchmaking engine, and interest rate calculation modules.
- **Processes to the Implementation**:
    - Show the flow from the initial credit score evaluation to loan approval and match completion.

7. Deployment View

- This section will describe how the system will be deployed across different environments:
    1. **External Desktop PC**: Access for borrowers to apply for loans and lenders to manage loan offers.

2. **Desktop PC**: For administrators to manage the backend, loan processing, and user management.
3. **Registration Server**: Centralized server for managing borrower-lender registration and data storage.
4. **Course Catalog**: Can be repurposed to describe how user data (borrowers and lenders) are stored and managed.
5. **Billing System**: If needed, this can reflect how fees or payments between borrowers and lenders are tracked.

8. Performance

- Highlight the expected performance outcomes such as:
    - Faster loan processing times due to automated assessments.
    - Improved scalability for high-volume loan applications.
    - Reliable uptime and responsiveness of the web portal for user

9. Quality

- Discuss how the system will ensure high-quality user experiences:
    - Security: Ensuring borrower and lender data is securely processed and stored.
    - Accuracy: Loan offers tailored to risk profiles with high precision.
    - Compliance: Full compliance with financial regulations such as GDPR and KYC.