BankPro: A Banking and Loan Management Application

Introduction

BankPro is a web-based application designed to provide users with a platform to manage their banking and loan needs. The application offers a range of features, including user registration, login, loan creation, and loan listing. BankPro is designed with a user-friendly interface and aims to provide a seamless experience for both personal and business banking customers.

Features and Functionality

BankPro offers the following key features:

User Registration and Login: Users can create an account with BankPro by providing their name, email, role, and password. Registered users can log in to access their account and use the application's features.

Loan Creation: Authenticated users can create new loans by providing details such as loan type, loan number, amount, interest rate, and loan term. The application calculates the loan amount based on the provided information.

Loan Listing: BankPro allows users to view a list of their loans, as well as a list of all loans for admin and staff users. The loan listing includes details such as loan type, loan number, amount, interest rate, and calculated loan amount.

User Listing (Admin): Admin users have access to a list of all registered users, including their name, email, and role.

Design and Implementation

BankPro is built using Node.js and Express.js for the backend, with MongoDB as the database. The frontend is designed using EJS templates and CSS. The application follows the Model-View-Controller (MVC) architecture, with separate controllers for handling user and loan-related operations.

The application uses Express middleware for session management, body parsing, and logging. User authentication is implemented using session-based authentication, and access control is enforced through middleware functions.

Flow Diagram
PDF of diagram included for reference.

API Endpoints
BankPro provides the following API endpoints:

User Registration: POST /api/v1/users/signup
User Login: POST /api/v1/users/login
User Logout: GET /api/v1/users/logout
Get All Users (Admin): GET /api/v1/users/
Get User by ID: GET /api/v1/users/:id
Update User by ID: PATCH /api/v1/users/:id
Get All Loans: GET /api/v1/loans/
Create New Loan: POST /api/v1/loans/
Get Loan by ID: GET /api/v1/loans/:id

Testing
The application was tested using Postman to verify the functionality of the API endpoints. Test cases were created for user registration, login, loan creation, and loan listing. All tests were successful and produced the expected results. Screenshots included for reference in separate pdf.

Challenges and Risks
One of the challenges faced during the development process was implementing access control for different user roles. This was addressed by creating middleware functions to check the user's role and restrict access to certain routes based on the role.

As with any web application, there are potential security risks, such as unauthorized access to user data. To mitigate these risks, the application uses session-based authentication and enforces access control for sensitive routes.

Conclusion
BankPro is a comprehensive banking and loan management application that provides users with a convenient platform to manage their financial needs. With its user-friendly interface and robust features, BankPro aims to enhance the banking experience for both personal and business customers.

References
Node.js Documentation: https://nodejs.org/en/docs/
Express.js Documentation: https://expressjs.com/en/4x/api.html
MongoDB Documentation: https://docs.mongodb.com/manual/
Mongoose Documentation: https://mongoosejs.com/docs/guide.html
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Express-Session Documentation: https://www.npmjs.com/package/express-session
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