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Project requirement (Car management system)

Project Title: Car Management App

1. **Project Overview**

The project involves the development of a car management app using Java Spring Boot and Thymeleaf frameworks. The app provides users with a platform to manage and track their car-related information, including expenses, fuel usage, maintenance schedule, and due maintenance. The system will also provide reports in a PDF format sent to the user's email. Furthermore, the system must ensure data privacy and security through appropriate authentication and authorization mechanisms.

2. **Functional Requirements**

2.1 User Management

- User Registration: New users can register by providing necessary details.
- User Login: Registered users can log in to the system. Authentication should be handled securely.

3. 2.2 Dashboard
    - Home: Users can view a summary of their car information and upcoming schedules.
4. 2.3 My Car
    - Add Car: Users can add a car along with details like fuel usage, expenses, maintenance info, and car photo.
    - Update Car Details: Users can update the details of their car.
    - View Car Details: Users can view all their car details.
    - Delete Car: Users can delete their car details if they want.

- Download Car Photo: Users can download their car's photo.

5. 2.4 Report
    - Generate Report: Users can generate a detailed report of expenses, fuel usage, due maintenance, and car details, which will be emailed to them in a PDF format.
6. 2.5 Schedule
    - Schedule Maintenance: Users can schedule maintenance for their car. The system will automatically schedule maintenance every 3 months.
7. 2.6 Due Maintenance
    - View Due Maintenance: Users can view their pending maintenance tasks and their due dates.
    - Mark as Complete: Users can mark their due maintenance tasks as complete.
8. 2.7 Logout
    - Users can log out from their account securely.

9. Non-Functional Requirements

- Security: The system should ensure user data privacy. No user should be able to view others' data. All endpoints should be secure. Implement appropriate authentication, authorization, and session management using Spring Security.
- Performance: The system should respond quickly to user actions and requests.
- Usability: The system should provide a clean, user-friendly interface.

10. Technical Requirements

- Back-end development using Java Spring Boot.
- Front-end development using Thymeleaf.
- Use Spring Schedule for scheduling tasks.
- Use iText, PDF, and Java Mail libraries to implement the report functionality.
- CRUD operations to allow users to create, read, update, and delete data.

11. Acceptance Criteria

- The system allows users to manage their car details, expenses, fuel usage, and maintenance schedule.
- The system generates and sends reports to the user's email in a PDF format.
- The system ensures data privacy and security.
- The system allows users to schedule maintenance tasks which are automatically scheduled every 3 months.
- The system provides a clean, user-friendly interface.

12. Project Schedule

- To be decided based on the team's velocity and client's requirements.

13. Assumptions and Constraints

- The project assumes that users have a valid email address for report delivery and user account management.
- The project assumes that users have internet access.
- Project constraints include the project schedule, budget, and available resources.

14. Approval and Sign-off

- To be provided by the project sponsor or client.

15. Data Management

- all user data is stored in mysql database
- user password is stored after getting hashed with BCrypt.

16. Deployment

- car management app will be deployed on railway platform