Daily Habit Tracker with Gamification

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1. Project Name

Daily Habit Tracker with Gamification

2. Project Description

The Daily Habit Tracker is a motivational application designed to help users build and maintain positive habits through gamification. The app addresses the common challenge of staying consistent by turning the process of habit formation into an engaging game. Users can track their daily activities, monitor their progress, and earn rewards, such as badges and streaks, for their consistency. By providing visual feedback and a sense of accomplishment, the application encourages long-term user engagement and personal growth.

3. Tech Stack

- **Frontend**: **React** – To build a highly interactive and responsive user interface, including components like the habit calendar, progress charts, and badge collection display.
- **Backend**: **Spring Boot** – To create a powerful backend that manages user data, habit logic, and gamification rules through REST APIs.
- **Database**: **MongoDB** – A NoSQL database chosen for its flexibility in storing semi-structured data, making it ideal for managing user profiles with varying habits and achievements.

4. Architecture

The application follows a **monolithic architecture**, where the frontend, backend, and database are developed as a single, cohesive unit.

The **React** frontend communicates with the **Spring Boot** backend via a set of RESTful APIs. The backend contains all the business logic for managing habits, tracking streaks, and awarding badges. It interacts directly with a single **MongoDB** database, which serves as the central repository for all user and application data. This architecture is straightforward to develop, deploy, and maintain for this type of application.

5. System Design

5.1 High-Level Design (HLD)

- **User Interaction**: The user logs into the React dashboard to view their habits.
- **Tracking**: The user marks a habit as complete for the day.
- **API Call**: The React frontend sends an API request to the Spring Boot backend to record the completion.
- **Gamification Logic**: The backend updates the habit's data, calculates the current streak, and checks if the user has met the criteria for any new badges.
- **Data Persistence**: All changes are saved to the appropriate collections in the MongoDB database.
- **Feedback Loop**: The backend sends a response to the frontend with the updated stats (e.g., new streak count, earned badges), which are then displayed to the user.

5.2 Low-Level Design (LLD)

Database Collections (MongoDB):

- **Users**: { user_id, username, email, password, badges: [...] }
- **Habits**: { habit_id, user_id, name, description, streak_count, creation_date }
- **Completions**: { completion_id, habit_id, date }
- **Badges**: { badge_id, name, description, criteria: { streak_days: 5 } }

Sample API Endpoints:

- **Habit Module**
  - POST /api/habits - Create a new habit for the user.
  - POST /api/habits/{id}/complete - Mark a habit as completed for the day.
  - GET /api/users/{userId}/habits - Fetch all habits for a specific user.
- **Stats & Gamification Module**

    - GET /api/users/{userId}/stats - Retrieve progress statistics (streaks, completion rates).
    - GET /api/users/{userId}/badges - Get all badges earned by the user.

6. Future Scope

- **Social Features**: Introduce a friend system where users can share their progress and compete in group challenges.
- **Push Notifications**: Implement daily reminders to help users stay on track with their habits.
- **Advanced Analytics**: Provide users with more detailed visual reports and insights into their performance over time.
- **Customizable Rewards**: Allow users to set their own personal rewards for achieving specific milestones.
- **Mobile Application**: Develop native Android and iOS applications for a more seamless mobile experience.