Full Stack Project Documentation

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Project Name:

HabitForge: Gamified Habit Tracking Platform

Project Description:

HabitForge is an engaging productivity application designed to help users build and sustain positive habits through gamification. The platform transforms routine habit tracking into a motivating experience by rewarding consistency with streaks, badges, and progress stats. By offering interactive visual feedback, HabitForge promotes long-term commitment, empowering users to achieve their personal growth goals in a fun and measurable way.

Technology Stack:

Frontend: React – for building an interactive, responsive dashboard with features like the habit calendar, progress charts, and badge collection.

Backend: Spring Boot – for implementing REST APIs that handle user data, gamification logic, and habit tracking workflows.

Database: MongoDB – chosen for its flexibility in handling dynamic user profiles, varying habit types, and gamification rewards.

Architecture:

HabitForge follows a monolithic architecture for simplicity in academic scope.

- The React frontend communicates with the Spring Boot backend via REST APIs.
- The backend processes gamification rules (streak updates, badge allocation) and manages habit-related data.
- A MongoDB database stores user accounts, habits, streak data, and earned rewards.

This architecture ensures ease of development, testing, and deployment within project constraints.

System Design

High-Level Design

1. **User Login:** Users access their personalized dashboard.
2. **Habit Tracking:** Users mark daily completions for their habits.
3. **API Calls:** The frontend sends completion updates to the backend.
4. **Gamification Logic:** The backend updates streak counts, checks badge criteria, and calculates progress.
5. **Database Persistence:** MongoDB stores updated stats and history.
6. **Feedback Loop:** Updated streaks, stats, and badges are returned to the frontend for visualization.

Low-Level Design

- **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.
- POST /api/habits/{id}/complete – Mark habit as complete for the day.
- GET /api/users/{userId}/habits – Retrieve user's habits.

Gamification & Stats Module

- GET /api/users/{userId}/stats – Fetch habit progress and streaks.
- GET /api/users/{userId}/badges – Retrieve earned badges. validated.

Future Scope

- Social Features: Add friend systems and group challenges.
- Reminders: Push notifications for daily habit reminders.
- Advanced Analytics: Insights with detailed charts and long-term performance breakdowns.
- Custom Rewards: Allow users to set personal rewards for milestones.
- Mobile App: Extend support to Android/iOS for a seamless mobile experience.