JAVA FULL STACK DEVELOPMENT PHASE 3 PROJECT

Project Name: Travel Booking Cab

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Overview

This project aims to develop a travel management software solution for George's travel company. The application will enable users to register, log in, and book cabs conveniently while allowing administrators to manage bookings, users, and cab details. Built on Spring and Spring Boot frameworks, the system will adopt a microservices architecture to ensure scalability, modularity, and maintainability. RESTful APIs will connect the frontend and backend, and the project will undergo thorough unit testing to ensure robustness.

Project Methodology

Approach: Agile Development
Framework: The Agile methodology ensures iterative development and regular stakeholder feedback, enabling faster deliveries and better alignment with user needs.

Project Lifecycle

Sprint 1 (2 Weeks): Analysis and Requirements

User Stories:

1. User Registration:
    - Title: Register
    - As a: New user

    - I want to: Create an account
    - So that: I can access the travel application and book cabs.
2. User Login:
    - Title: Login
    - As a: Existing user
    - I want to: Log into my account
    - So that: I can view and book cabs.
3. Cab Booking:
    - Title: Book a Cab
    - As a: User
    - I want to: Book a cab to a specific location
    - So that: I can travel conveniently for my trips.
4. Admin Login:
    - Title: Admin Dashboard Access
    - As a: Admin
    - I want to: Access the admin portal
    - So that: I can create, update, retrieve, and delete data for users, bookings, and cabs.

Acceptance Criteria:

1. User Registration:
    - Scenario: User visits the registration page.
    - Given: The user provides valid details (e.g., username, email, password).
    - When: The form is submitted.
    - Then:
        - The user sees a success message.
        - The user is redirected to the login page.
2. User Login:
    - Scenario: User visits the login page.
    - Given: The user provides valid credentials.
    - When: The login form is submitted.
    - Then:
        - The user is redirected to the cab booking page.
3. Admin Login:
    - Scenario: Admin visits the login page.
    - Given: Admin provides valid credentials (username: admin, password: admin123).

    - When: Admin logs in successfully.
    - Then:
        - Admin is redirected to the dashboard.
        - Admin can manage users, bookings, and cab data.

Sprint 2 (2 Weeks): Development and Testing

Development Tools and Technologies:

- Tools:
    - Spring Tool Suite for backend development.
    - Google Chrome for frontend testing.
    - Git and GitHub for version control.
    - Tomcat Server for application hosting and deployment.
- Languages and Frameworks:
    - Frontend: HTML, CSS, Angular.
    - Backend: Java, Spring Boot, Spring Framework.
    - Database: MySQL for data persistence.

Tasks Breakdown

1. Database Design:

- Define schema to manage:
    - User data (username, email, password).
    - Cab details (cab ID, location, status).
    - Booking details (user ID, cab ID, booking time, destination).
- Implement tables with relationships to optimize queries.

2. Frontend Development:

- Registration and Login Pages:
    - Create simple, user-friendly interfaces for registration and login using HTML and CSS.
- Cab Booking Page:
    - Design a responsive page to show available cabs and allow bookings.

- Admin Dashboard:
    - Develop pages for managing:
        - Users: Add, edit, delete, and view.
        - Bookings: View and manage booking details.
        - Cabs: Update cab statuses and availability.

3. Backend Development:

- Implement microservices for core functionality:
    - UserService: Handles registration, login, and user profile management.
    - CabService: Manages cab availability and details.
    - BookingService: Processes booking requests and maintains booking records.
    - AdminService: Provides CRUD operations for users, bookings, and cabs.
- Use RESTful APIs to integrate frontend and backend services.

4. Validation:

- Add input validation for registration and login forms:
    - Ensure email follows a valid format.
    - Validate password strength.

5. Authentication:

- Implement secure authentication mechanisms for both users and admins.
- Hardcode admin credentials in the database for initial development.

6. Integration:

- Connect Angular-based frontend with backend microservices using REST APIs.

7. Testing:

- Unit Testing: Validate each microservice's logic and APIs.
- Integration Testing: Ensure proper communication between frontend and backend.
- End-to-End Testing: Test complete workflows, including:
    - User registration and login.
    - Cab booking process.
    - Admin management of users, bookings, and cabs.

Expected Outcomes

- A fully functional Travel Booking Cab application with the following features:
    - User registration, login, and cab booking functionality.
    - Admin dashboard for managing users, bookings, and cab details.
- Scalability and maintainability achieved through microservices architecture.
- Secure and user-friendly application for real-world deployment.

Flow Chart: