



# Project Title: Backend-Only Personalized Health and Wellness Recommendation System

## Project Description:

In this innovative project, we will develop a backend-only Personalized Health and Wellness Recommendation System using Microservices, Spring Boot, JPA, API Gateway, Discovery Server, and Authentication Service. The system aims to provide users with tailored health and wellness recommendations, facilitate progress tracking, encourage community engagement, offer nutrition information, support mental health, utilize data analytics, and provide feedback analysis. This comprehensive platform empowers individuals to make informed decisions about their health and well-being.

## Key Features and Components:

### Microservices Architecture:

The system will employ a microservices architecture to ensure modularity and scalability. Each microservice will address specific aspects of health and wellness recommendations and data management.

### Spring Boot:

Spring Boot will serve as the foundational framework for developing microservices. Its capabilities will expedite the creation of robust and scalable back-end services.

### JPA (Java Persistence API):

JPA will facilitate data persistence and interaction with a relational database. Entities representing user profiles, health data, recommendations, feedback, and community interactions will be defined and managed using JPA.

### API Gateway:

An API Gateway will centralize request routing, security, and authentication. It will ensure a unified and secure API surface for client interactions.

### Discovery Server:

The Discovery Server will manage service registration and discovery for microservices. It enables dynamic scaling and load balancing, ensuring system reliability.

### Authentication Service:

The Authentication Service will handle user registration, login, and session management. Secure user authentication and access token generation will be implemented.

## Key Functionalities and API Samples:

Please note that these are just samples of the functionalities and API endpoints:

### 1. User Profile and Health Data Management:

**/users/register:** User registration.

**/users/login:** User login.

**/users/profile:** Manage user profile information.

**/users/health-data:** Manage personal health data.



## 2. Health and Wellness Recommendations:

- /recommendations/diet:** Get personalized diet recommendations.
- /recommendations/exercise:** Receive exercise routines.
- /recommendations/mental-health:** Access mental health exercises.
- /recommendations/sleep:** Receive sleep schedule recommendations.

## 3. User Feedback and Progress Tracking:

- /feedback/submit:** Submit feedback on recommendations.
- /progress/track:** Track health and wellness progress.
- /progress/insights:** View insights based on progress data.

## 4. Notification Service (Optional):

- /notifications/preferences:** Configure notification preferences.
- /notifications/send:** Send personalized recommendations via notifications.

## 5. Community and Social Integration:

- /community/groups:** Create or join wellness groups.
- /community/posts:** Share achievements and wellness updates.
- /community/interactions:** Like, comment, and follow other users' posts.

## 6. Nutrition Information Service:

- /nutrition/search:** Search for foods and recipes.
- /nutrition/details:** Retrieve nutritional facts for specific foods.
- /nutrition/recommendations:** Receive dietary recommendations.

## 7. Mental Health and Stress Management:

- /mental-health/exercises:** Access mental health exercises.
- /mental-health/mood-tracking:** Log and track mood data.
- /mental-health/recommendations:** Receive mental health recommendations.

## 8. Data Analysis (Optional):

- /ml/analyze:** Analyze data from DB directly.
- /ml/predictions:** Get personalized predictions and insights.
- /ml/update-recommendations:** Adjust recommendations based on insights.

## 9. Feedback Analysis Dashboard:

- /dashboard/feedback:** View user feedback and satisfaction.
- /dashboard/progress:** Monitor user progress and trends.
- /dashboard/recommendations:** Make data-driven decisions to improve recommendations.

## Project Goals:

1. Develop a comprehensive back-end system for personalized health and wellness recommendations.
2. Ensure data privacy and security through user authentication and secure data handling.
3. Provide a wide range of features for health tracking, community engagement, advanced data analysis.
4. Implement efficient data storage and retrieval using JPA for user profiles, recommendations, and feedback etc.
5. Leverage a microservices architecture for modularity, scalability, and maintainability.

This project aims to empower individuals to take control of their health and wellness by providing tailored recommendations and comprehensive support through innovative technology and data-driven insights. You may modify the endpoints as per your understanding, you may add more APIs if needed.



### **Deliverable and instructions:**

1. We will provide you a private GitHub repository for every team, each members of the team will be collaborators, you will submit your works accordingly, we will check your commits in GitHub.
2. Team leaders will be responsible to assign the services to team members and he/she will help team members to do requirements analysis and project planning.
3. Team leaders will assign tasks to members through Redmine.
4. API documentation needs to be prepared.
5. One-to-one interview will be conducted after project submission, we will check your code through GitHub commits, but each and everyone should be able to know the whole project works and business logic.
6. Though 2 services are optional but we're expecting all teams to finish all the features above, and you're allowed to think more of these features and APIs.