NutriTrack (Java Full-Stack)

A PROJECT REPORT

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IN
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Reference Website:

https://github.com/Souvikdas040/food-app – "Food-App" showcases RESTful Java backend, React UI and MySQL persistence, covering user auth plus food CRUD and calorie calculation.

Project Description:

NutriTrack Web is a lightweight calorie-tracking website that lets users log meals, track daily nutrients and visualize progress.

Key capabilities:

- Secure sign-up/login (JWT).
- Add, edit or delete food items with calories, protein, carbs, fat and meal type.
- Daily dashboard totals nutrients and highlights remaining allowance.
- History view with date picker and weekly calorie trend chart.
- Responsive React UI; REST APIs built with Spring Boot.

Problem Statement:

- India is seeing a rapid rise in lifestyle disorders (obesity, diabetes, hypertension).
- Diet logging is proven to improve weight-management outcomes, yet most existing trackers are:
  - Mobile-only, pay-walled, or cluttered with ads.
  - Closed-source and hard to customize for academic or personal R&D.
- Universities and junior developers need an open, end-to-end Java reference project that demonstrates modern web architecture (Spring Boot + React) while solving a real health problem.

Goal / Project Objective:

Design and implement “NutriTrack Web”, an open-source Java full-stack application that:

- Authenticates users (JWT) and enforces data privacy.
- Provides CRUD operations for food entries with nutritional fields (calories, protein, carbs, fat, meal type).
- Calculates daily and weekly totals and visualises them via interactive charts.
- Stores data in relational tables using Spring Data JPA and MySQL (fallback H2 for local dev).
- Delivers a responsive React front-end so users can access the tracker on desktop or mobile browsers.

By addressing the above problem, NutriTrack Web not only fills a practical health-tech gap but also serves as a comprehensive learning artifact for students aiming to master modern Java web development.

High-Level Design:

Layer	Technology	Responsibilities
Frontend	React 18, React Router, Axios, Chart.js	- SPA routing (Dashboard, History, Login) - Forms & validation - Calorie charts
API Gateway	Spring Boot (Spring Web, Spring Security, Spring MVC)	- JWT auth filter - REST controllers (/auth, /foods, /summary)
Business	Spring Services	- Input validation - Calorie & macro aggregation - Goal evaluation
Persistence	Spring Data JPA, Hibernate, MySQL	- User, FoodEntry, Goal entities - CRUD repositories
DevOps	Maven, Docker, Flyway	- Build & dependency management - Containerized deployment - DB migrations

Data flow:

1. React form POST /foods → Axios sends JWT-secured request.
2. FoodController validates DTO → Service persists via JPA.
3. Service returns updated daily summary → React state updates dashboard totals.
4. Chart component fetches /summary/week to draw 7-day calorie trend.

Future Scope

- **Barcode & Nutrition API**: Auto-populate macros via OpenFoodFacts.
- **Mobile PWA**: Add service-worker for installable offline experience.
- **Social Challenges**: Share streaks, compete with friends.
- **AI Meal Suggestions**: Recommend meals that fit remaining macros using simple rule-based engine, upgradeable to ML.
- **Cloud Sync & Scalability**: Migrate to AWS RDS + S3 for images, use Spring Cloud Gateway and Docker Compose for micro-services.

NutriTrack Web offers an approachable yet expandable Java full-stack project—perfect for demonstrating modern web development skills while delivering a genuinely useful health tool.