

WOLVERHAMPTON FitHub: A Gym Companion Application

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Introduction

FitHub is designed to make fitness more accessible, intelligent, and enjoyable. Developed using React Native for the front end and Django with Python for the back end. This application addresses key challenges faced by fitness enthusiasts:

- Exercise Discovery: Users can find workouts tailored to their fitness level, available equipment, and targeted muscle groups—ensuring personalized and effective training.
- Smart Nutrition Planning: By evaluating metrics such as height, weight, age, and fitness goals, the app generates customized meal plans that align with individual health objectives.
- Intelligent Posture Detection: Using real-time pose estimation, the app evaluates user form during exercises like squats and deadlifts. With dedicated Beginner and Pro modes, it provides corrective feedback to help users improve their posture, avoid injury, and get better results.

At its core, the Gym Companion Application acts as a virtual fitness coach, guiding users through every aspect of their fitness journey—offering the right workouts, tailored nutrition, and real-time form correction—all from the convenience of their smartphone.

Academic Question

The academic question with my Gym Application is as:

How can Al-driven pose estimation and personalized fitness recommendations enhance the effectiveness and safety of workout routines in mobile fitness applications?

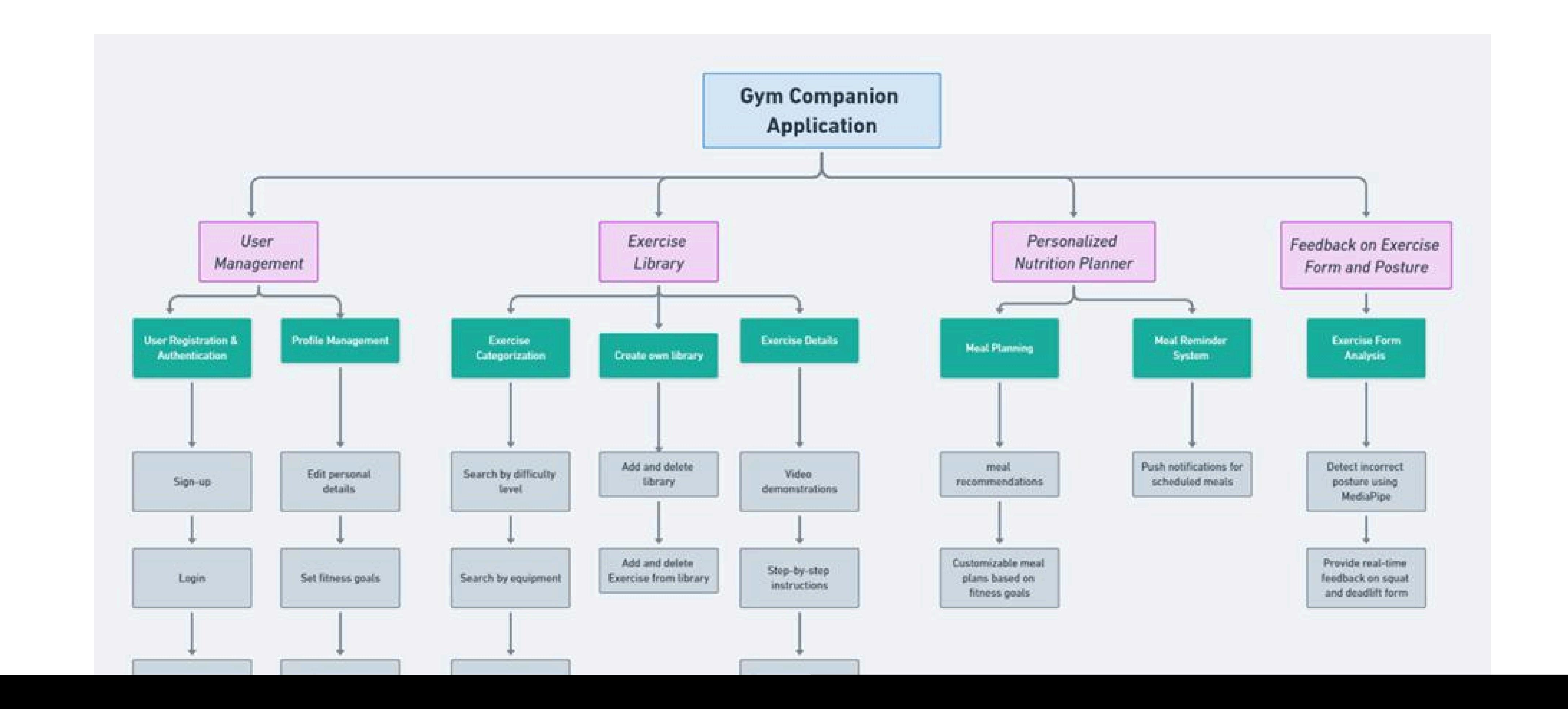
Aims

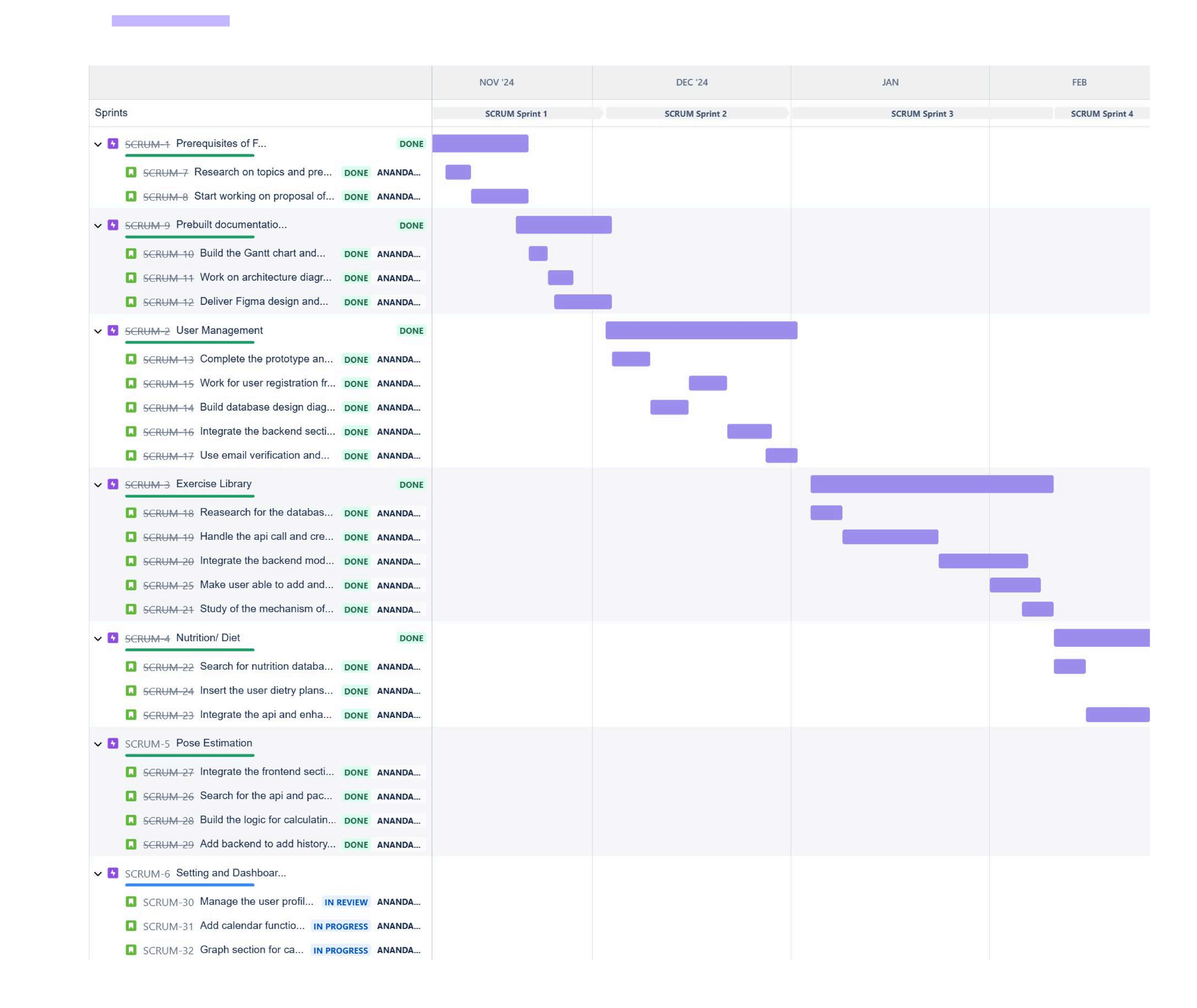
- Enhance Exercise Effectiveness
- Ensure Workout Safety
- Provide Personalized Nutrition Planning
- Improve User Engagement
- Bridge the Gap Between Home and Gym Workouts
- Support Long-Term Fitness Progression

Objectives

- Implement Al-Powered Pose Estimation for Exercise Tracking
- Provide Personalized Nutrition Planning
- Enhance User Engagement and Progression
- Develop an Interactive and Accessible User Interface
- Ensure a Secure and Scalable Backend

Product Process





System Evaluation & Testing

Test ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status (Pass/Fail)	Comments
		Authentica	tion Module			
AUTH-02	Forgot Password with OTP	 Click "Forgot Password." Enter email/phone. Enter OTP. 	OTP sent successfully. Password reset allowed.			
AUTH-03	JWT Token Validation	 Log in. Access protected route with token. 	Access granted. Token expires after set time.			
AUTH-04	Invalid OTP Handling	1. Enter incorrect OTP.	Error message: "Invalid OTP."			
		Exercise Lib	orary Module	10		oli.
LIB-01	Filter Exercises by Difficulty	1. Select difficulty level (e.g., Beginner).	Only beginner-level exercises displayed.			
LIB-02	Filter Exercises by Equipment	1. Select equipment (e.g., Dumbbells).	Only exercises using dumbbells displayed.			
LIB-03	Calculate Sets/Weight/Reps	1. Enter weight (50 kg), reps (10), sets (3).	Total volume calculated correctly (1500 kg).			
LIB-04	View Exercise Details	Click on an exercise.	Muscle groups, instructions, and video displayed.			
		Workout Lo	gging Module			
LOG-01	Save Daily Workout Routine	 Create a routine. Save routine. 	Routine saved and accessible in history.			
LOG-02	Track time after workout starts	1. Add exercise with timer (e.g., 30 seconds).	Timer starts/stops correctly. Notification sent at end.			

LOG-03	Track Muscle Groups Worked	Complete a workout.	Muscle groups logged and displayed in progress tracker.	
		Exercise Sugg	estions Module	
SUG-01	Recommend Exercises Based on Goals	1. Set goal.	Strength-focused exercises recommended.	
SUG-02	Recommend Exercises Based on Preferences	Set preference (e.g., No Machines).	Only bodyweight exercises recommended.	
		Custom Wo	kout Module	
CUST-01	Create Custom Workout	 Add exercises to a new routine. Save routine. 	Custom routine saved and accessible.	
CUST-02	Modify Custom Workout	 Edit an existing routine. Save changes. 	Routine updated successfully.	
		Personalized N	itrition Planner	
NUT-01	Create Personalized Nutrition Plan	 Enter user details (age, weight, goals). Generate plan. 	Nutrition plan generated based on user inputs.	
NUT-02	Adjust Nutrition Plan Based on Preferences	 Set dietary preferences (e.g., vegan). Regenerate plan. 	Plan updated to exclude non-vegan items.	
NUT-03	Track Daily Calorie Intake	 Log meals. View calorie summary. 	Calorie intake displayed accurately.	
NUT-04	Suggest Recipes Based on Goals	 Set goal (e.g., weight loss). View recipe suggestions. 	Recipes aligned with weight loss goal displayed.	