

1) Identify the Modules

Your AI fitness app likely has the following modules:

- User Authentication & Profile Management (Login, Registration, Profile Editing)
 - Workout Recommendation Engine (AI-based personalized workout suggestions)
 - Diet & Nutrition Tracker (Meal logging, calorie tracking)
 - Progress Tracking (Graphs, analytics, and goal setting)
 - Live Workout Assistance (AI-based form correction, voice guidance)
 - Social & Community Features (Sharing progress, challenges)
 - Payment & Subscription Management (If premium features exist)
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2) Unit Test Cases

Unit tests check individual components like functions, classes, or modules

Test Case ID	Component	Test Description	Expected Output
UT-01	Login Function	Validate correct user credentials	User logs in successfully
UT-02	AI Workout Suggestion	Ensure correct recommendations based on user preferences	Workout plan matches user goals
UT-03	Meal Logging	Verify accurate calorie calculation after logging a meal	Calories update correctly in the UI
UT-04	Progress Tracker	Ensure weekly reports generate correctly	Weekly analytics display properly
UT-05	Payment Processing	Test correct handling of successful transactions	User receives premium access

3) Integration Test Cases

Testing interactions between different modules

Test Case ID	Modules Involved	Test Description	Expected Output
IT-01	Login + Profile	Check if login redirects to profile setup for new users	User is taken to profile page after first login
IT-02	AI Workout + Progress Tracking	Ensure completed workouts update progress tracker	Progress bar updates after workout completion
IT-03	Diet Tracker + AI Recommendations	Verify if dietary intake affects workout recommendations	AI suggests alternative workouts based on diet
IT-04	Payment + User Access	Ensure premium features unlock after payment	User can access premium workouts and meal plans
IT-05	Social Features + Progress	Test if sharing progress updates works properly	Progress post appears on the social feed

4) System Test Cases

4a) Sanity Test Cases

Basic checks to ensure key features work after updates

Test Case ID	Feature	Test Description	Expected Output
ST-01	Login System	Ensure login and logout function work correctly	User logs in and out without issues
ST-02	Workout Tracking	Verify a workout session can be started and saved	Session is logged successfully
ST-03	Meal Logging	Test adding and deleting a meal entry	Meal list updates correctly
ST-04	Payment System	Ensure a failed payment doesn't grant access	User remains on free plan after failed transaction
ST-05	Notifications	Verify push notifications for workout reminders	Notification is sent at the correct time

4b) Performance Test Cases

Checking app's responsiveness and speed

Test Case ID	Feature	Test Description	Expected Output
PT-01	App Launch	Measure time taken to open the app	App loads within 3 seconds
PT-02	AI Recommendations	Ensure AI workout plans generate quickly	Recommendations appear within 2 seconds
PT-03	Meal Logging	Test how fast a meal entry updates	UI updates instantly upon entry
PT-04	Large User Load	Check system performance with 10,000+ concurrent users	No crashes or slowdowns
PT-05	Video Workouts	Ensure live video workouts stream without lag	Smooth video playback

4c) Security Test Cases

Ensuring protection against vulnerabilities

Test Case ID	Feature	Test Description	Expected Output
SEC-01	Authentication	Test login with incorrect credentials multiple times	Account locks after 5 failed attempts
SEC-02	Data Privacy	Ensure profile data isn't accessible without authentication	Unauthorized access is denied
SEC-03	Payment System	Test SQL Injection attack on payment processing	System rejects malicious queries
SEC-04	API Security	Ensure API keys are not exposed in network requests	API keys remain hidden
SEC-05	User Data Encryption	Verify if sensitive data (passwords) is encrypted in the database	Data is securely stored

4d) Stress Test Cases

Checking app behavior under extreme conditions

Test Case ID	Feature	Test Description	Expected Output
STR-01	Simultaneous Logins	Attempt 1,000 logins in 1 second	No system crashes
STR-02	Heavy Data Input	Upload 10,000 meal logs at once	System handles data without lag
STR-03	Live AI Coaching	Test AI video form correction under extreme loads	AI responds within an acceptable time
STR-04	Concurrent Users	Simulate 50,000 users on the app	App functions normally
STR-05	High-Frequency Requests	Rapidly request AI workout plans 1,000 times	No slowdown beyond expected limits

4e) Acceptance Test Cases

Ensuring app meets business and user expectations

Test Case ID	Feature	Test Description	Expected Output
AT-01	User Registration	Ensure a new user can sign up and access workouts	User completes sign-up process
AT-02	AI Recommendations	Validate that AI workout suggestions match user goals	AI provides relevant workouts
AT-03	Subscription Model	Ensure premium features are accessible after payment	User can access exclusive content
AT-04	UI/UX	Test overall navigation and ease of use	Users can navigate without confusion
AT-05	Accessibility	Ensure app is accessible for visually impaired users	App works with screen readers and high contrast mode