

CASE STUDY ON

SMART FITNESS

ADIL BIN HARIS KHAN
43731007

INTRODUCTION

- The Smart Fitness Management System is a comprehensive web-based platform designed to simplify gym and personal training operations.
- It enables members to register, manage their profiles, book workout sessions, and interact with certified trainers in a streamlined and user-friendly environment.
- Trainers can create and manage their availability, define session types, and track bookings from members. The system also allows administrators to oversee members, trainers, and session data, ensuring smooth coordination across the platform.
- The application supports secure authentication, restricting access so that only registered users can log in and perform actions according to their assigned roles – Admin, Trainer, or Member.
- Session booking, scheduling, and tracking are central features, allowing members to view available trainers, book preferred sessions, and keep track of completed and upcoming workouts.
- The platform enhances engagement through a modern UI, intuitive navigation, and informative fitness dashboards. With structured data management through Spring Boot and REST APIs, the system ensures reliability, scalability, and efficient communication between the client interface and server.
- Ultimately, Smart Fitness provides a digital ecosystem where members, trainers, and administrators collaborate efficiently, reducing manual workloads and delivering a seamless fitness experience.

ABSTRACT

- The Smart Fitness Management System is a web-based application designed to digitize and streamline the interaction between gym members, trainers, and administrators.
- The system enables members to manage their fitness profiles, book training sessions, and monitor progress, while trainers can oversee assigned clients, schedule workout sessions, and manage availability. Administrative users have extended capabilities to add, update, and delete member and trainer records, ensuring efficient data handling and operational control.
- The platform integrates secure user authentication and role-based access, providing separate views and functionalities for each type of user. Session management forms the core of the system, facilitating smooth scheduling and transparent communication between members and trainers.
- Built using Spring Boot on the backend and a glass-morphism inspired modern frontend, the system emphasizes usability, efficiency, and an enhanced user experience.
- By providing a centralized digital solution, the Smart Fitness Management System reduces manual processes, increases transparency, and ensures reliable access to essential information. It serves as a scalable foundation for future enhancements such as advanced analytics, wearable integration, and fully automated membership plan handling.

WHAT WE ARE GOING TO BUILD: CLIENT REQUIREMENT

- Users can register, log in, and log out securely with role-based access (Admin and Member).
- Members can view and manage their fitness profile and membership details.
- Members can browse trainers, viewing specialization, experience, and availability.
- Members can book training sessions by selecting a trainer, session type, and date.
- Members can view previous and upcoming sessions in a structured dashboard.
- Admins can add, update, and delete member and trainer accounts.
- Admins can manage session bookings, including modifying or removing records.
- The platform provides clear navigation across Home, Trainers, Sessions, and Login.
- The UI delivers a clean, modern experience for interacting with trainers and sessions.

TECHNICAL UNDERSTANDINGS

- REST-based authentication using Login and Registration controllers.
- Role-based access control (Admin & Member) for secure feature segregation.
- MVC architecture with controllers managing key routes such as /members, /trainers, /sessions, and /auth.
- CRUD operations using HTTP methods—POST for create, GET for read, PUT for update, DELETE for remove.
- Front-end integration via HTML, CSS, and JavaScript consuming Spring Boot REST APIs.
- Session booking flow implemented through multi-step API interactions: select trainer → choose session → confirm booking.
- Persistent storage using JPA entities and repositories for Members, Trainers, and Sessions.
- CORS enabled communication allowing frontend and backend interaction seamlessly.
- Optional modular UI features including dashboards, modals, and cards enhancing user experience.

TECH-STACK AND TOOLS

- Framework: Spring Boot
- Backend Language: Java
- Build Tool: Maven
- Core Modules: Spring Web, Spring Data JPA
- Authentication: Basic role-based login handling
- Database: MySQL
- ORM: Hibernate via JPA
- Server: Embedded Apache Tomcat (Spring Boot default)
- Frontend Stack: HTML5, CSS, JavaScript (REST API consumption)
- UI Theme: Glassmorphism + Dark mode aesthetic
- Testing & Debugging Tools: Browser DevTools, Postman for REST API testing
- IDE / Dev Environment: IntelliJ IDEA / Eclipse
- Version Control (Optional): Git

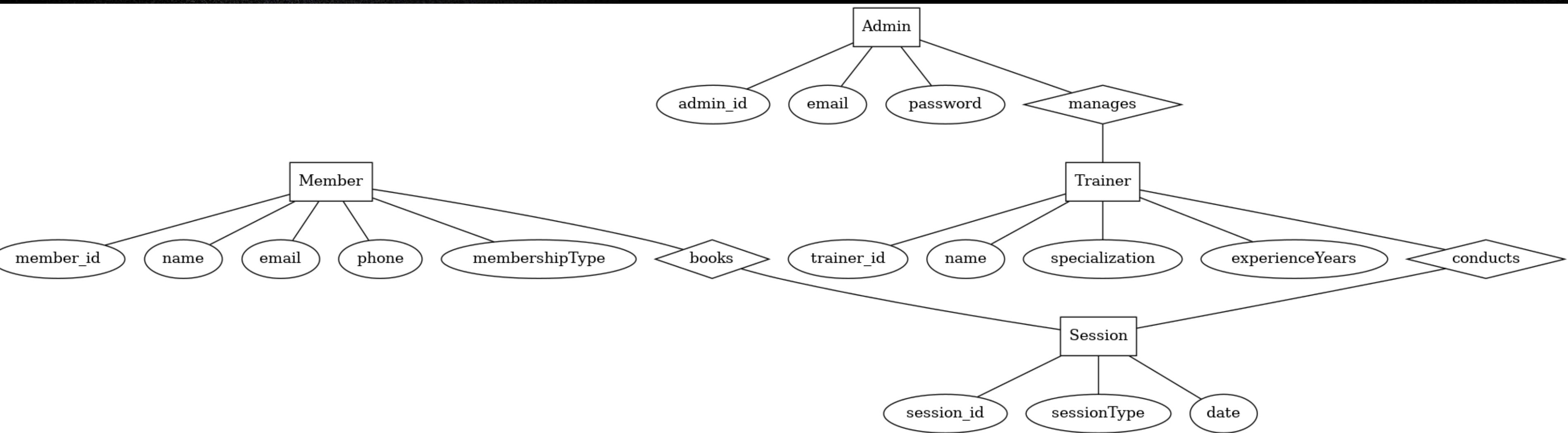
SYSTEM REQUIREMENTS

- Operating System
- Windows / Linux / macOS
- Backend Environment
- Java Development Kit (JDK 8 or above)
- Spring Boot Framework
- Spring Web & Spring Data JPA modules
- Database
- MySQL 8.0 (or compatible version)
- Server
- Embedded Apache Tomcat (via Spring Boot)
- Development Tools
- IDE: IntelliJ IDEA / Eclipse / Spring Tool Suite (STS)
- Build Tool: Maven
- Frontend
- HTML5, CSS, JavaScript
- Compatible modern browser: Chrome / Firefox / Edge

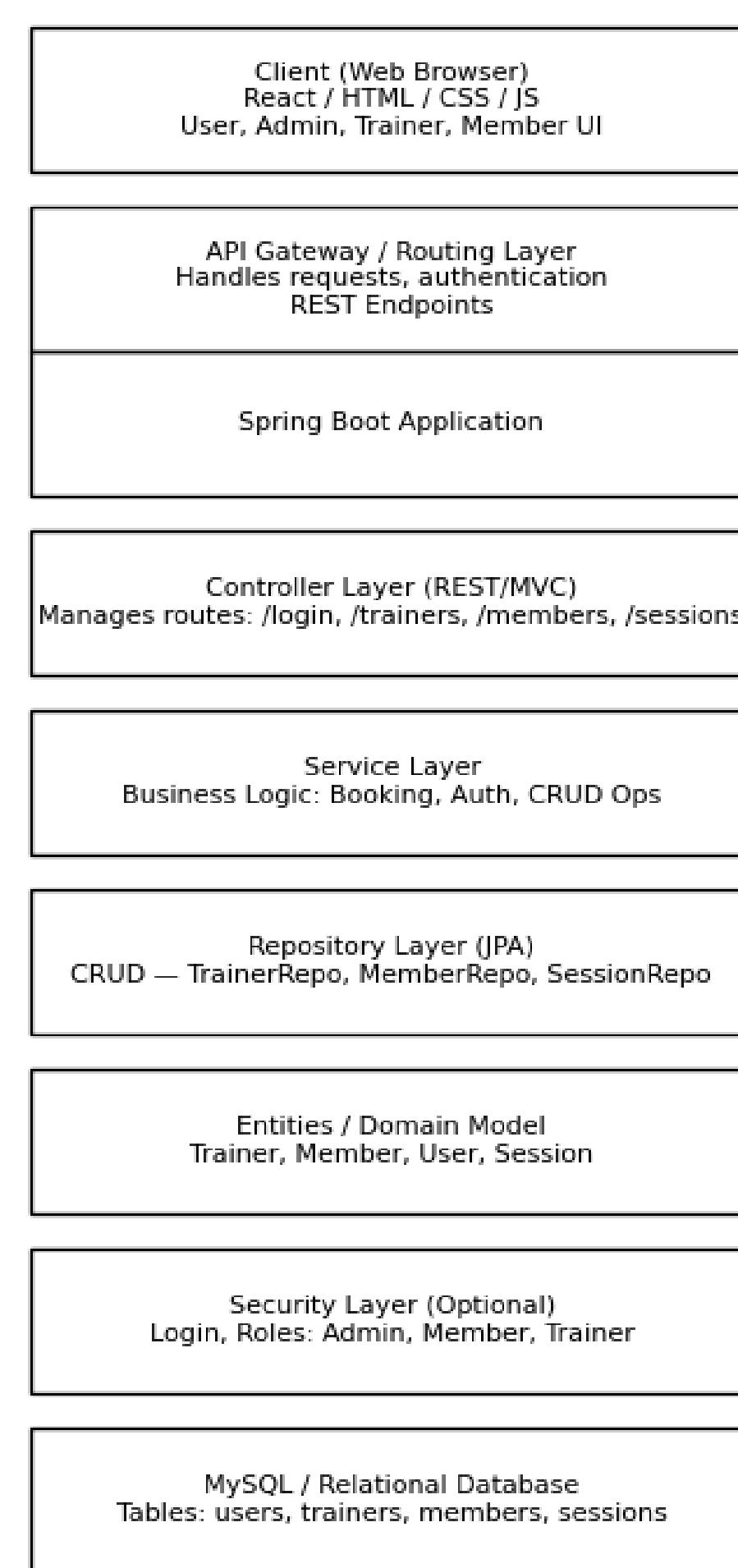
PROJECT MODULE

- » ADMIN MODULE
- » USER MODULE
- » TRAINER MODULE
- » MEMBER MODULE
- » SESSION MODULE

ENTITY-RELATIONSHIP DIAGRAM



ARCHITECTURE DIAGRAM



ADMIN MODULE

The Admin Module serves as the backbone of the Smart Fitness System. It grants complete authority to the administrator, enabling them to control users, trainers, and sessions. Admins ensure that the platform functions smoothly, remains secure, and operates within defined business rules. They manage core system data, monitor platform activities, and maintain overall system integrity. By having centralized control, admins are able to enforce policies and provide a seamless experience for trainers and members.

KEY FUNCTIONALITIES

- Full control over system data and configurations
- Add, update, and delete trainer records
- Manage members and user accounts
- View and monitor all scheduled and completed sessions
- Approve or oversee feedback and usage reports
- Ensure platform security and proper access permissions
- Handle system maintenance and database population

USER MODULE

The User Module handles authentication and platform accessibility for all users, whether admin, trainer, or member. It ensures that login and registration are handled securely and that each user is directed to the appropriate dashboard based on their role. This module forms the first layer of interaction with the system and ensures a safe and smooth login experience.

KEY FUNCTIONALITIES

- Register new user accounts
- Log in and log out securely
- Session management and authentication
- Update personal profile details
- Redirect based on user role (Admin / Trainer / Member)
- Provide controlled access to platform features

TRAINER MODULE

The Trainer Module empowers fitness trainers to interact with the system efficiently and professionally. Trainers can manage their profiles, set availability, and track their scheduled sessions. This module connects trainers with members, enabling personalized coaching experiences. Trainers are also able to update session information and monitor appointments, making their operations streamlined and user-friendly.

KEY FUNCTIONALITIES

- CREATE AND MAINTAIN TRAINER PROFILES AND SPECIALIZATIONS
- VIEW ASSIGNED OR BOOKED MEMBER SESSIONS
- UPDATE SESSION DETAILS SUCH AS DATE, TYPE, OR STATUS
- MANAGE PERSONAL AVAILABILITY AND SCHEDULE
- INTERACT WITH MEMBER BOOKINGS THROUGH CONFIRMATION OR UPDATES
- TRACK HISTORICAL AND UPCOMING SESSIONS

MEMBER MODULE

The Member Module focuses on individuals who seek fitness services on the platform. It provides all features necessary for members to explore trainers, book sessions, and manage personal accounts. The interface ensures members can easily navigate schedules, view available services, and track session history. This module provides a seamless and user-centric experience for all fitness-seeking participants.

KEY FUNCTIONALITIES

- Register or maintain member profiles
- Search and explore available trainers
- Book fitness sessions based on type, date, or trainer
- View previous, upcoming, and cancelled session history
- Receive booking status and confirmation
- Update membership details and communication info

DATA DICTIONARY

MySQL Workbench

Local instance MySQL80 ×

File Edit View Query Database Server Tools Scripting Help



Navigator:

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

SQL File 5* ×

```
15 •  SELECT * FROM trainers;
16 •  SELECT * FROM members;
17 •  SELECT * FROM members;
18 •  SELECT * FROM admin;
19 •  use fitness_db;
```

Limit to 1000 rows



Result Grid

Tables_in_fitness_db
members
sessions
trainers
users



Result Grid

Result 13 ×



Form
Editor



Read Only

Output

Action Output

#	Time	Action	Message
11	15:43:12	SHOW TABLES	3 row(s) returned
12	16:07:20	use fitness_db	0 row(s) affected
13	16:07:22	use fitness_db	0 row(s) affected
14	16:07:28	show tables	3 row(s) returned

Administration Schemas

SQL File 5* 

```
17 •  SELECT * FROM members;
18 •  SELECT * FROM admin;
19 •  use fitness_db;
20 •  show tables;
21 •  SELECT * FROM members;
```

Result Grid |  Filter Rows: Edit:    Export/Import:   Wrap Cell Content: 

	id	email	membership_type	name	phone
▶	1	adilzaid7373@gmail.com	Diamond	Adil	92470927409
	2	adil@gmail.com	premium	Adil	132723
	3	zaidkhan@1	gold	Zaid	9347903470293
*	NULL	NULL	NULL	NULL	NULL

 Result Grid

 Form Editor

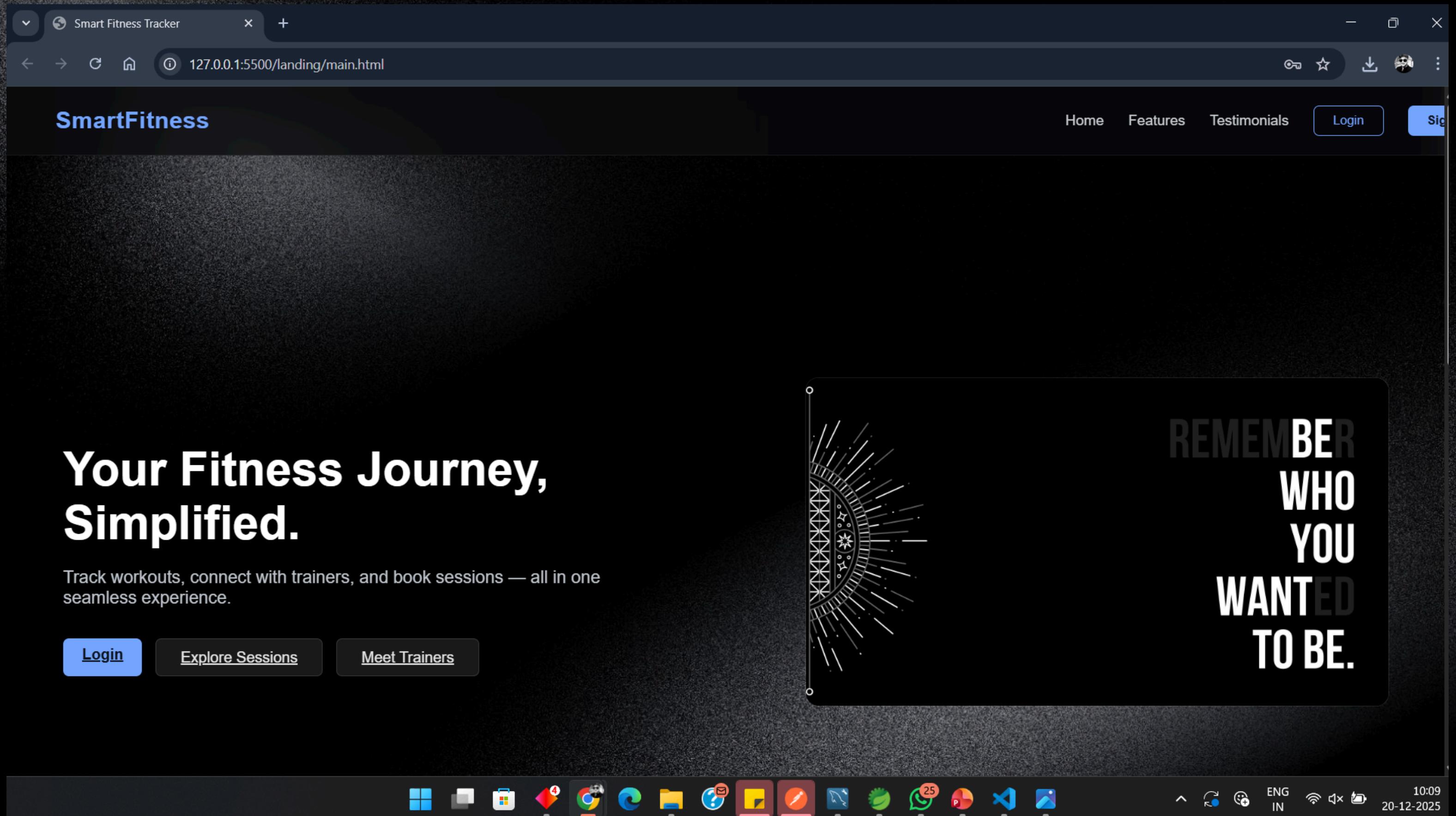
```
18 •   SELECT * FROM admin;
19 •   use fitness_db;
20 •   show tables;
21 •   SELECT * FROM members;
22 •   SELECT * FROM trainers;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: |

	id	email	experience_years	name	phone	specialization
▶	1	testtrainer@gmail.com	5	Test Trainer	9999999999	Yoga
●	2	king@12	10	king	937092309	cardio
*		HULL	HULL	HULL	HULL	HULL

Result Grid | Form Editor

LANDING PAGE



A screenshot of a web browser displaying the landing page for "Smart Fitness Tracker". The page has a dark background with white and light blue text. At the top, there's a navigation bar with links for Home, Features, Testimonials, Login, and Sign Up. The main headline reads "Your Fitness Journey, Simplified." Below it, a sub-headline says "Track workouts, connect with trainers, and book sessions — all in one seamless experience." There are three buttons: "Login" (blue), "Explore Sessions" (light blue), and "Meet Trainers" (light blue). To the right, there's a large graphic of a smartphone showing a sunburst pattern on its screen. To the right of the phone, the text "REMEMBER WHO YOU WANTED TO BE." is displayed in large, bold, white letters. The bottom of the screen shows a Windows taskbar with various pinned icons like File Explorer, Google Chrome, and Microsoft Word.

SmartFitness

Home Features Testimonials Login Sign Up

Your Fitness Journey,
Simplified.

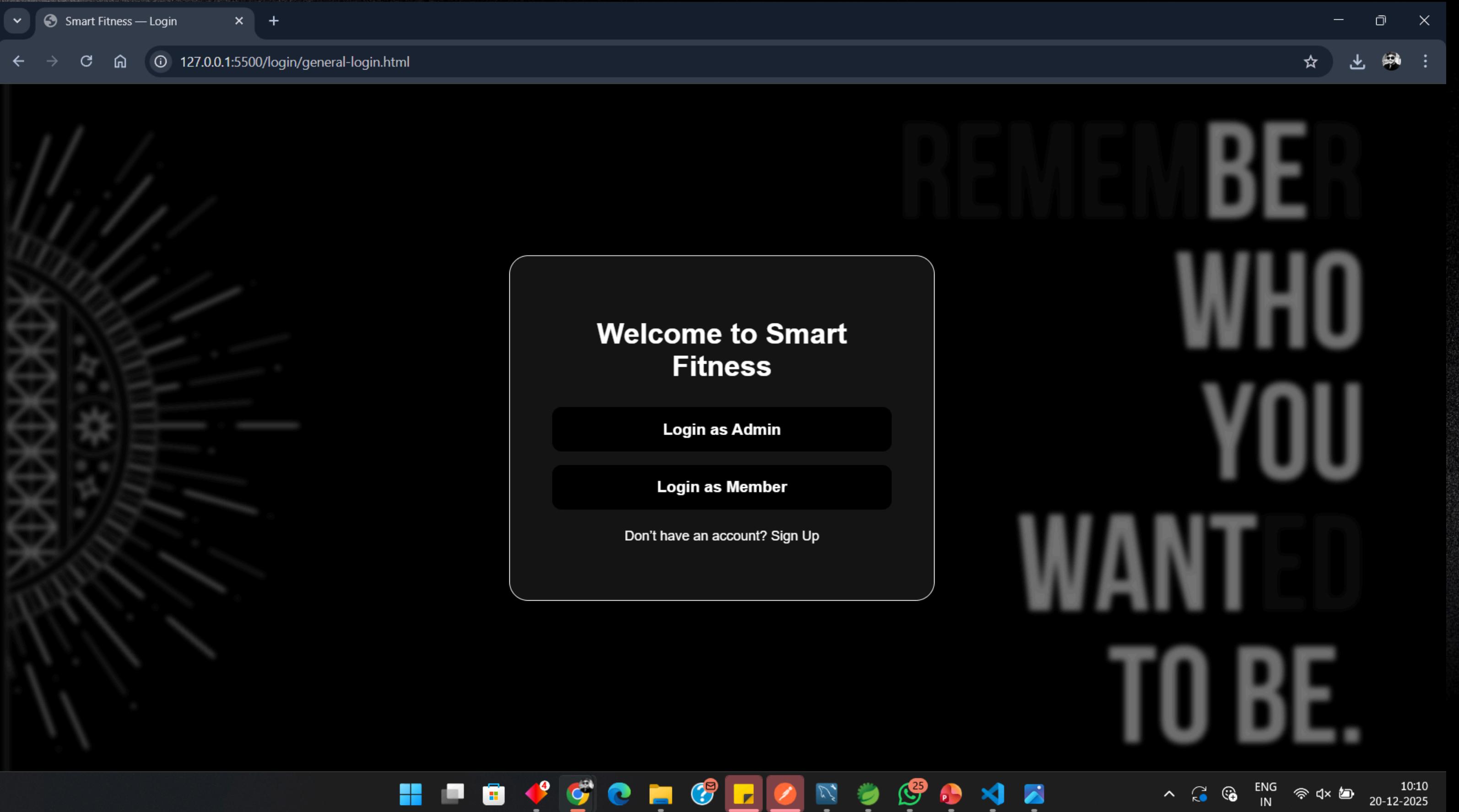
Track workouts, connect with trainers, and book sessions — all in one
seamless experience.

Login Explore Sessions Meet Trainers

REMEMBER
WHO
YOU
WANTED
TO BE.

10:09
ENG IN
20-12-2025

LOGIN PAGE



The image shows a screenshot of a web browser displaying the 'Smart Fitness — Login' page. The URL in the address bar is 127.0.0.1:5500/login/general-login.html. The main content is a dark-themed login form with a central box containing the text 'Welcome to Smart Fitness' and two buttons: 'Login as Admin' and 'Login as Member'. Below these buttons is a link 'Don't have an account? Sign Up'. The background features a large, faint watermark on the right side with the text 'REMEMBER WHO YOU WANTED TO BE.' The desktop taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:10 on 20-12-2025.

Smart Fitness — Login

127.0.0.1:5500/login/general-login.html

Welcome to Smart Fitness

Login as Admin

Login as Member

Don't have an account? Sign Up

REMEMBER WHO YOU WANTED TO BE.

10:10 20-12-2025

ADMIN PAGE

Admin Dashboard | Smart Fitn

127.0.0.1:5500/admin/admin.html

ADMIN

- Manage Members
- Manage Trainers
- Manage Sessions

Welcome, Admin

Control all system operations from here.

Members
View, Add, Update & Remove Members
Open

Trainers
Manage Trainers & Assign Sessions
Open

Sessions
Book & Monitor Training Sessions
Open

Logout



ENG IN 10:11 20-12-2025

ADMIN MEMBER MANAGEMENT

The image shows a screenshot of a web-based admin panel for a fitness center. The top navigation bar includes tabs for 'Admin' and 'Manage Members', and a URL bar showing '127.0.0.1:5500/admin/admin-members.html'. On the right side of the header are 'Back to Admin' and 'Logout' buttons. The main title 'Smart Fitness — Admin Panel' is at the top left. Below it, the section title 'Member Management' is centered. Three main buttons are displayed: 'Add Member' (purple background), 'Update Member' (grey background), and 'Delete Member' (red background). Each button has associated input fields: 'Add Member' has fields for Name, Email, Phone Number, and Membership Type; 'Update Member' has fields for Member ID, New Name, New Email, New Phone, and New Membership; 'Delete Member' has a single Member ID field. A large watermark for 'MEMBER' is visible across the page.

ADMIN TRAINER MANAGEMENT

Smart Fitness — Admin Panel

Trainer Management

Add Trainer

Full Name

Email

Phone

Specialization

Experience (years)

Add Trainer

Update Trainer

Trainer ID

New Name

New Email

New Phone

New Specialization

New Experience

Delete Trainer

Trainer ID

Delete Trainer

10:12 20-12-2025

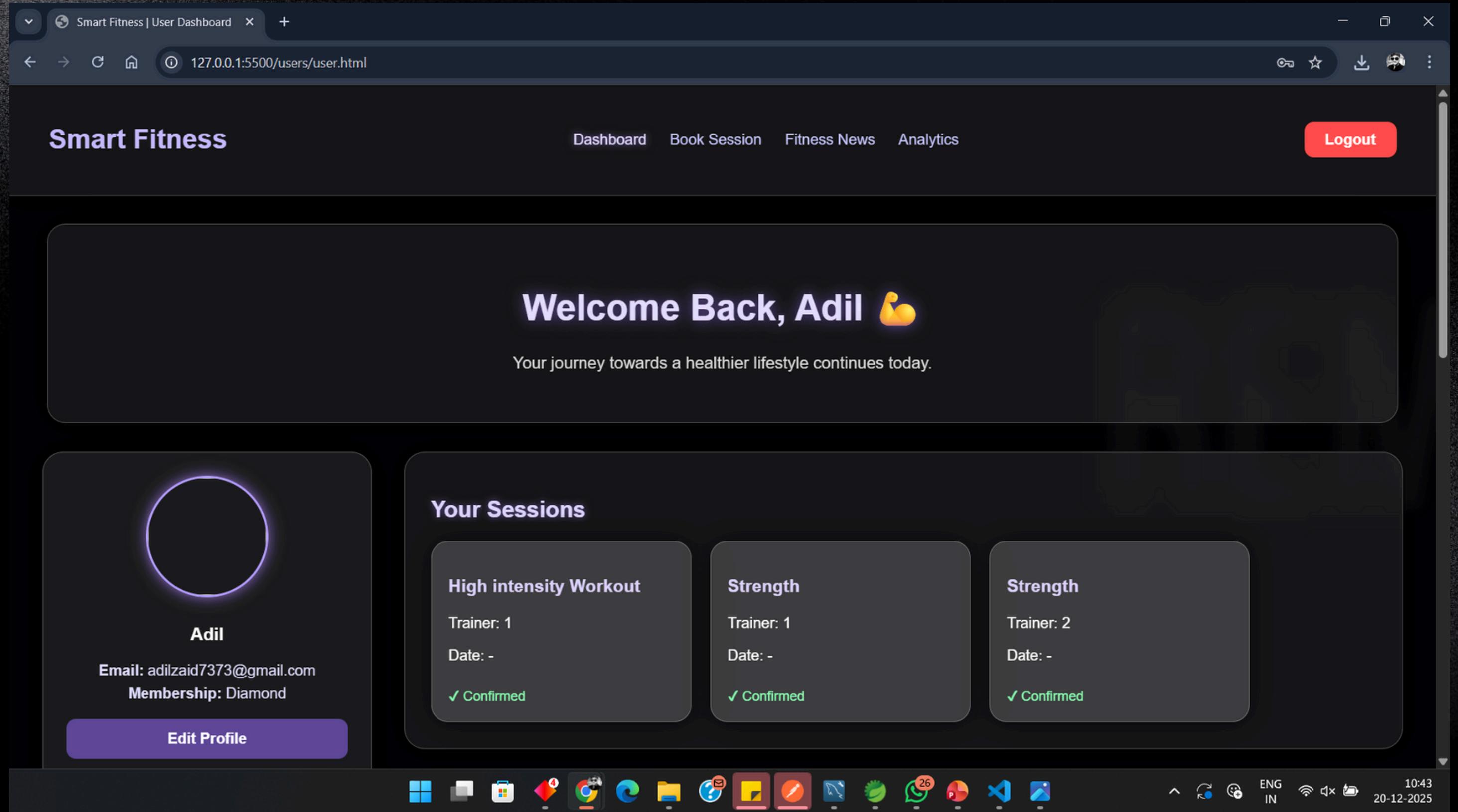
SESSION MANAGEMENT AND BOOKING

The screenshot shows a web browser window titled "Session Management | Smart Fit" with the URL "127.0.0.1:5500/sessions/Admin-sessions.html". The page is titled "Session Management" and contains six main functional areas:

- Book New Session**: Contains fields for Member ID, Trainer ID, and Session Type, followed by a "Book Session" button.
- View All Sessions**: Contains a "Load Sessions" button.
- View Single Session**: Contains a "Session ID" field and a "Get Session" button.
- Update Session**: Contains fields for Session ID and New Member ID.
- Delete Session**: Contains a "Session ID" field and a "Delete" button.

The browser's taskbar at the bottom shows various open applications, and the system tray indicates the date and time as 20-12-2025, 10:12, with language set to ENG IN.

USER/ MEMBER INTERFACE



The screenshot shows a user dashboard for "Smart Fitness" with a dark theme. At the top, there's a header bar with the title "Smart Fitness | User Dashboard" and a URL "127.0.0.1:5500/users/user.html". The header includes a "Logout" button on the right. Below the header, the main content area starts with a welcome message: "Welcome Back, Adil 💪". A sub-message below it reads: "Your journey towards a healthier lifestyle continues today." On the left, there's a profile section for "Adil" with a placeholder circular profile picture. It displays his email ("adilzaid7373@gmail.com") and membership level ("Diamond"). A purple "Edit Profile" button is at the bottom of this section. To the right, there's a "Your Sessions" section containing three cards: "High intensity Workout" (Trainer: 1, Date: -, Confirmed), "Strength" (Trainer: 1, Date: -, Confirmed), and another "Strength" card (Trainer: 2, Date: -, Confirmed). The bottom of the screen shows a taskbar with various application icons and system status indicators.

Smart Fitness

Dashboard Book Session Fitness News Analytics Logout

Welcome Back, Adil 💪

Your journey towards a healthier lifestyle continues today.

Adil

Email: adilzaid7373@gmail.com

Membership: Diamond

Edit Profile

High intensity Workout

Trainer: 1

Date: -

✓ Confirmed

Strength

Trainer: 1

Date: -

✓ Confirmed

Strength

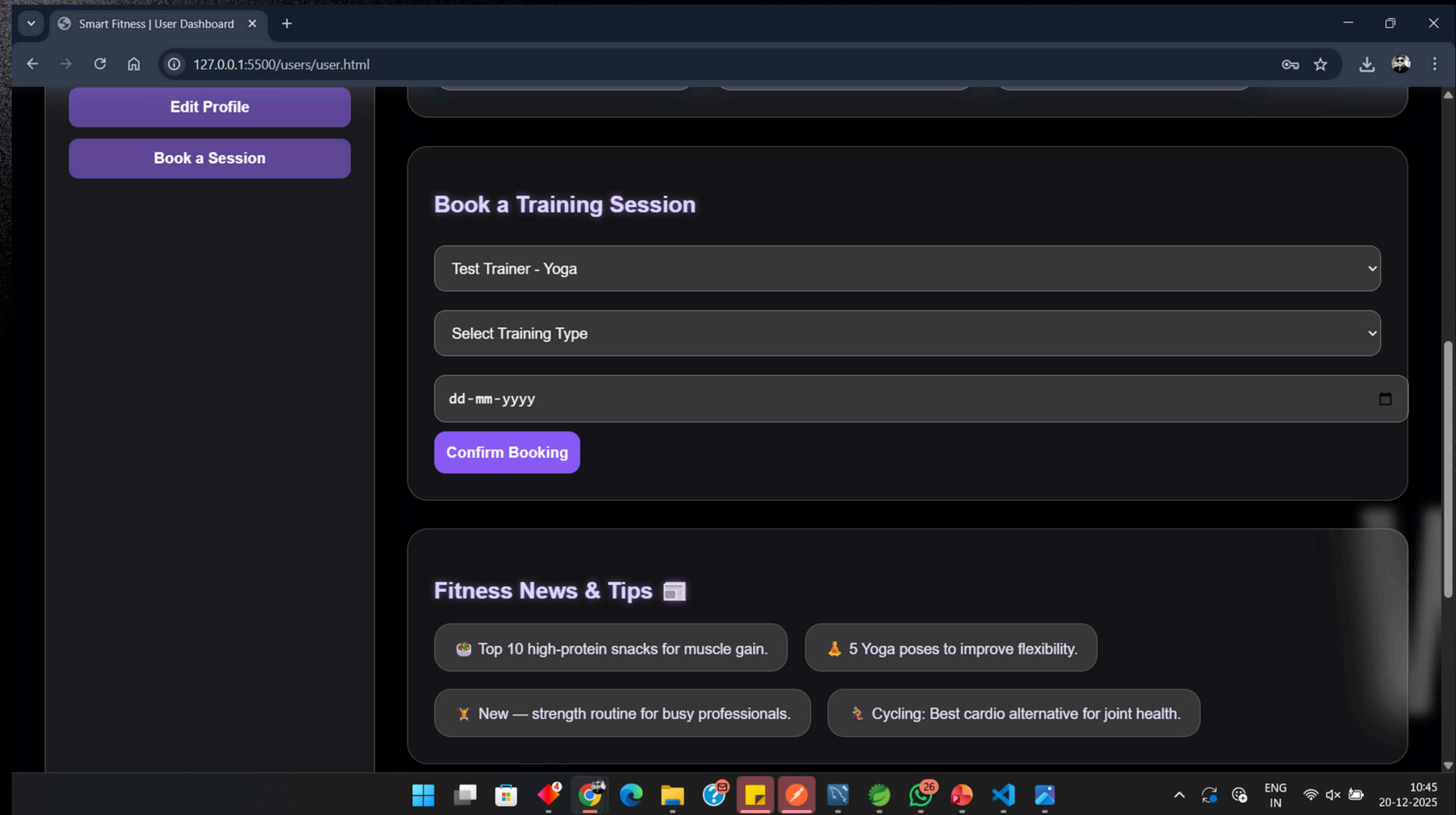
Trainer: 2

Date: -

✓ Confirmed

10:43
ENG IN
20-12-2025

USER/ MEMBER INTERFACE



The screenshot shows a user interface for a fitness application. At the top, there's a navigation bar with a back arrow, forward arrow, refresh icon, home icon, and a search bar containing the URL "127.0.0.1:5500/users/user.html". To the right of the search bar are standard browser controls: a lock icon, a star icon, a download icon, a refresh icon, and a more options icon.

The main content area has a dark background with light-colored UI elements. On the left side, there are two purple buttons: "Edit Profile" and "Book a Session".

In the center, there's a large card titled "Book a Training Session". It contains the following fields:

- A dropdown menu labeled "Test Trainer - Yoga".
- A dropdown menu labeled "Select Training Type".
- A date input field labeled "dd-mm-yyyy" with a calendar icon.
- A purple "Confirm Booking" button.

Below this card, there's another card titled "Fitness News & Tips" with a small icon of a newspaper.

Underneath the news card, there are four news items, each with a small icon and text:

- "Top 10 high-protein snacks for muscle gain." (snack icon)
- "5 Yoga poses to improve flexibility." (yoga icon)
- "New — strength routine for busy professionals." (strength icon)
- "Cycling: Best cardio alternative for joint health." (cycling icon)

At the bottom of the screen, there's a taskbar with various icons for apps like File Explorer, Google Chrome, and Microsoft Word. On the far right of the taskbar, there are system status icons for battery, signal, and volume, along with the text "ENG IN" and the date "20-12-2025" and time "10:45".

TRAINERS - USER INTERFACE

Meet Our Trainers

← Back



Test Trainer
Specialization: Yoga
Experience: 5 yrs
Contact: testtrainer@gmail.com
Work Hours: 6 AM - 8 PM
[Book Session](#)



king
Specialization: cardio
Experience: 10 yrs
Contact: king@12
Work Hours: 6 AM - 8 PM
[Book Session](#)

REMEMBER WHO YOU WANTED TO BE.



10:45 ENG IN 20-12-2025

THANK YOU

