CoachGPT Pro - Project Documentation

1. Project Goals

CoachGPT Pro is an AI-powered fitness assistant designed to:

- Generate personalized 4-week workout plans.

- Allow users to customize and track their plans.

- Manage users, exercises, and plan history.

- Integrate with LLM (e.g., OpenAI) for contextual feedback.

2. Microservices Architecture

The architecture includes the following services:

1. Frontend Service: React-based UI.

2. Backend Service: Node.js + TypeScript core logic.

3. LLM Service: Handles communication with OpenAI/GPT APIs.

4. PostgreSQL DB Service: Centralized database accessed by the backend.

3. Services Interaction

Frontend <--> Backend <--> LLM Service

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+--> PostgreSQL DB

4. Backend Folder Structure

Backend/

├── src/

│ ├── controllers/

│ │ ├── authController.ts

│ │ ├── exerciseController.ts

│ │ └── planController.ts

│ ├── db/

│ │ └── db.ts

│ ├── routes/

│ │ ├── authRoutes.ts

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│   │   ├── exerciseRoutes.ts
│   │   └── planRoutes.ts
│   ├── utils/
│   │   └── planUtils.ts
│   └── server.ts
├── tests/
│   ├── auth.test.ts
│   ├── exercise.test.ts
│   └── plan.test.ts
```

5. Unit Testing

Unit tests using Jest are implemented for all major features:

- Auth Controller
- Plan Controller
- Exercise Controller

6. Security Practices

- Passwords hashed with bcrypt
- JWT used for authentication
- Helmet and CORS middleware for security

7. Deployment

Docker Compose manages all services.

Each microservice is built and deployed independently.