AI Project

WORKOUT RECOMMENDATION SYSTEM

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PLAN

I. Problem Statement

How can we design an intelligent application powered by artificial intelligence that generates personalized workout programs tailored to a user's unique characteristics (e.g., age, weight, height, experience level, fitness goals, and targeted muscles)? The goal is to maximize the efficiency and accessibility of physical training while offering an engaging and intuitive user experience.

II. Architecture

MongoDB Connection → Document Encoding →

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Storing and retrieving data | **Preparing data for Storage**

Retrieval → Gemini API Call →Flask Server

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Kaggle data | **Enhance the Data with Gemini api** | **Accept Post requests from PHP**

III. Tools / programming languages / Frameworks

PHP

Rôle : Langage côté serveur pour gérer les requêtes et les réponses de l'application.

Flask

Rôle : Microframework Python pour gérer le backend et l'intégration avec les modèles IA.

Hugging Face

Rôle : Plateforme pour entraîner ou utiliser des modèles d'intelligence artificielle.

MongoDB Atlas

Rôle : Base de données NoSQL pour stocker des données scalables.

Ngrok

Rôle : Exposer des applications locales à Internet via un tunnel sécurisé

Kaggle

Rôle : Plateforme pour accéder à des datasets et entraîner des modèles IA.

Collab (Google Colab)

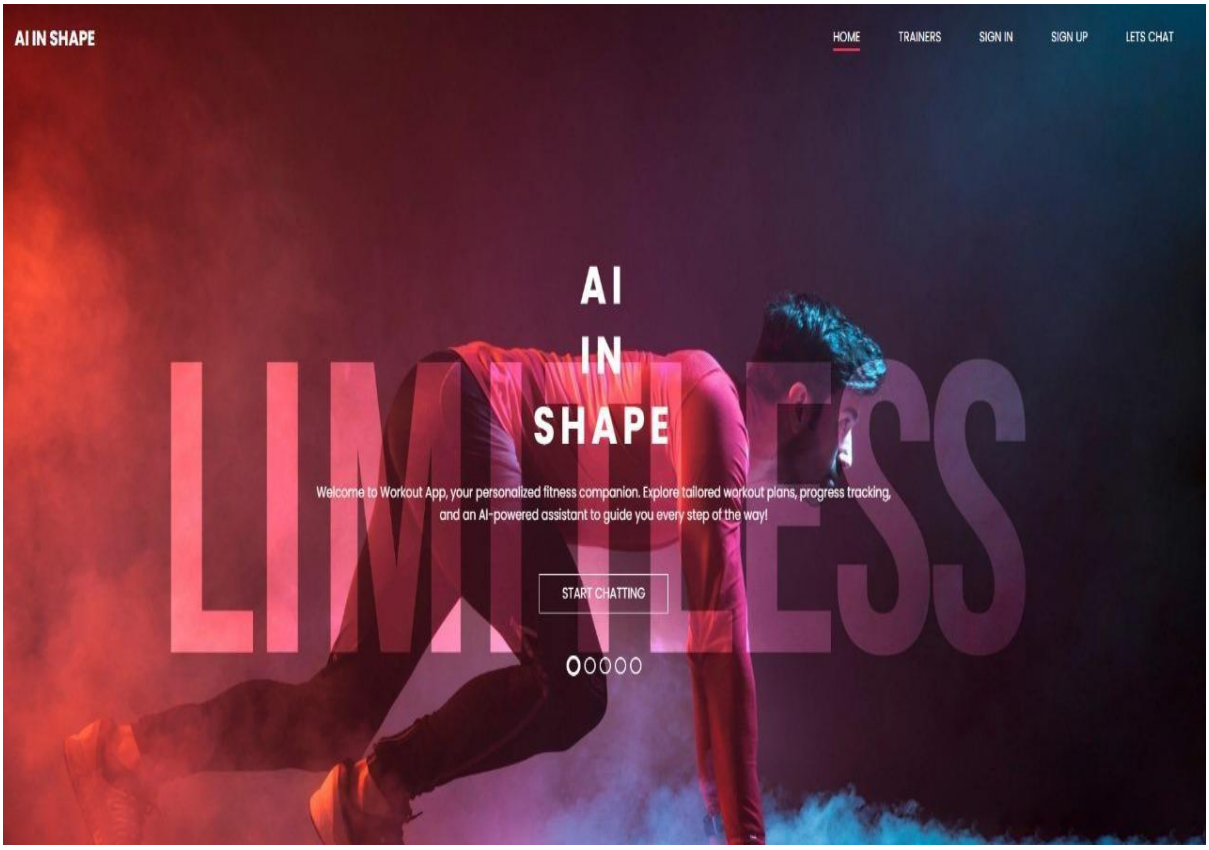
Rôle : Environnement collaboratif pour développer et tester des modèles IA.

Gemini

Rôle : Navigateur ou outil (selon contexte) pour afficher ou tester certaines interfaces ou services.

IV. Application screenshots

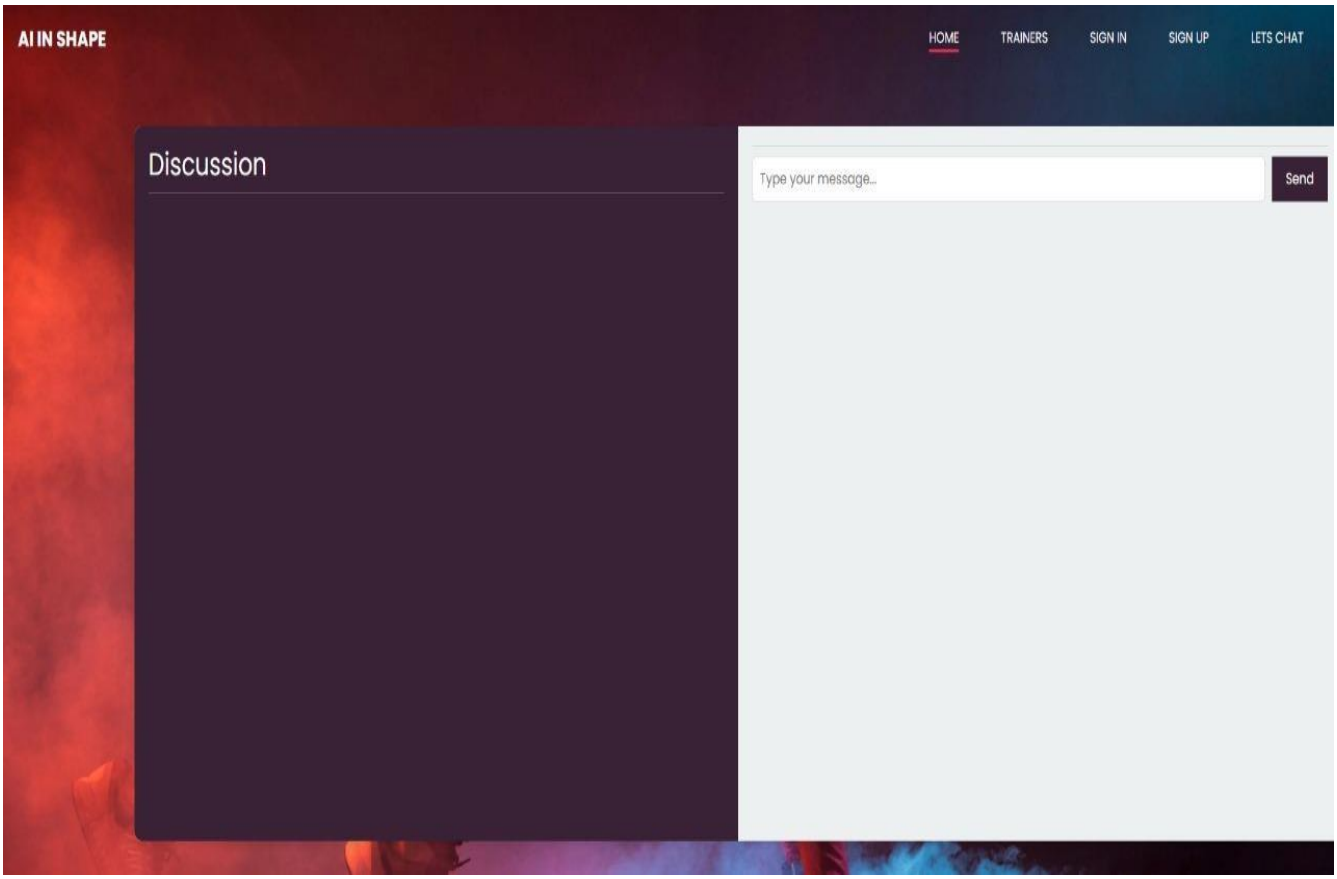
i. This is our home page :



This image depicts the home page of the web app , a workout recommendation system powered by artificial intelligence. The page has a modern and dynamic design featuring vibrant colors and a motivational theme. The title "AI IN SHAPE" stands prominently in the center, accompanied by a brief description highlighting the app's features, including tailored workout plans, progress tracking, and an AI-powered assistant for

guidance. A "Start Chatting" button invites users to interact with the AI assistant. Clicking this button leads to the "Let's Chat" page, where users can input their fitness-related questions or requests in a text prompt.

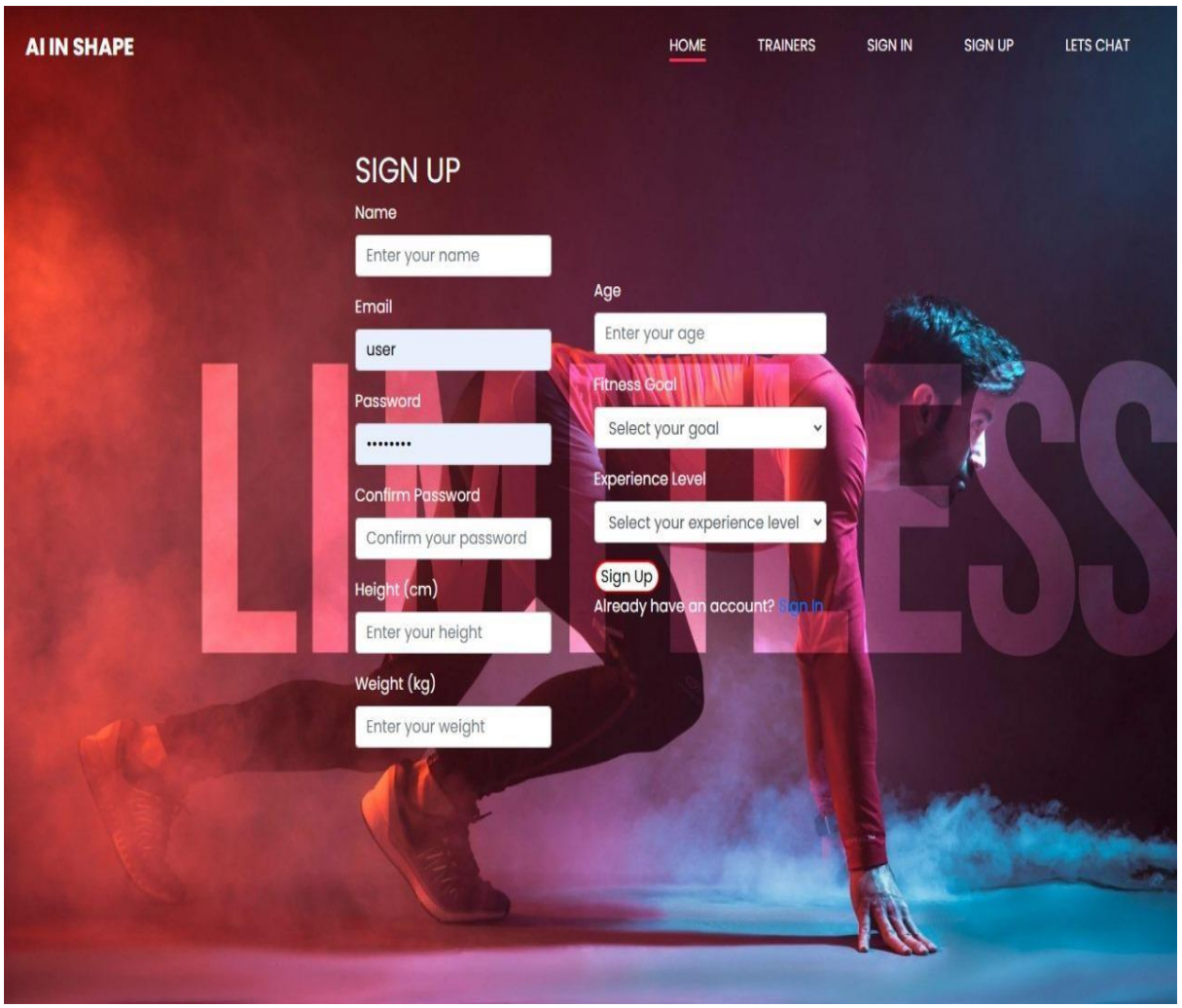
ii. This is our chatting page :



After clicking on the "Start Chatting" button , the user gets access to the chatting page , where he's able to write a prompt to the AI about any specific muscle that he desires to train (we've used a top-k of 7) .

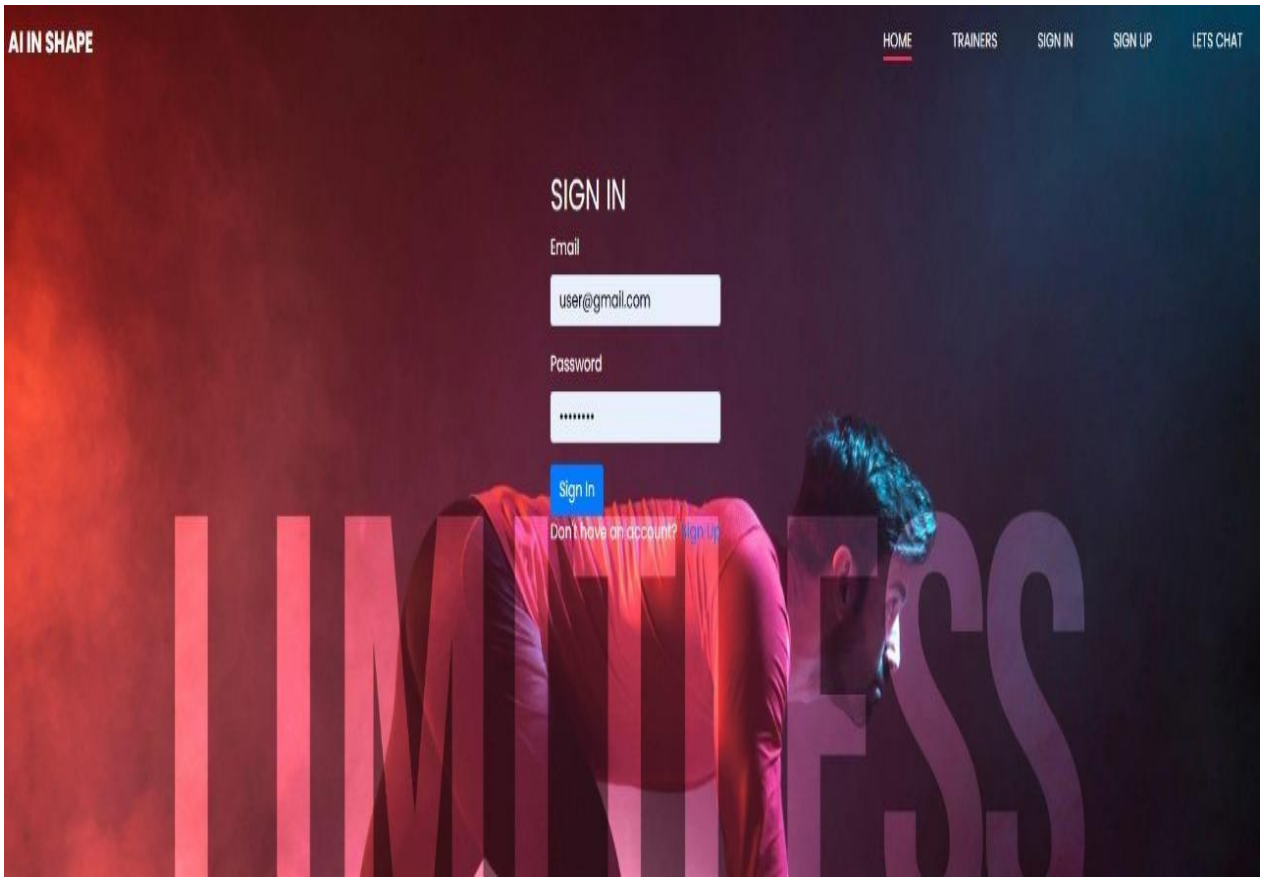
Each user has the right to specify how many exercises they want as part of the answer as It includes also a brief description of each exercise

iii. This is our Sign up form :



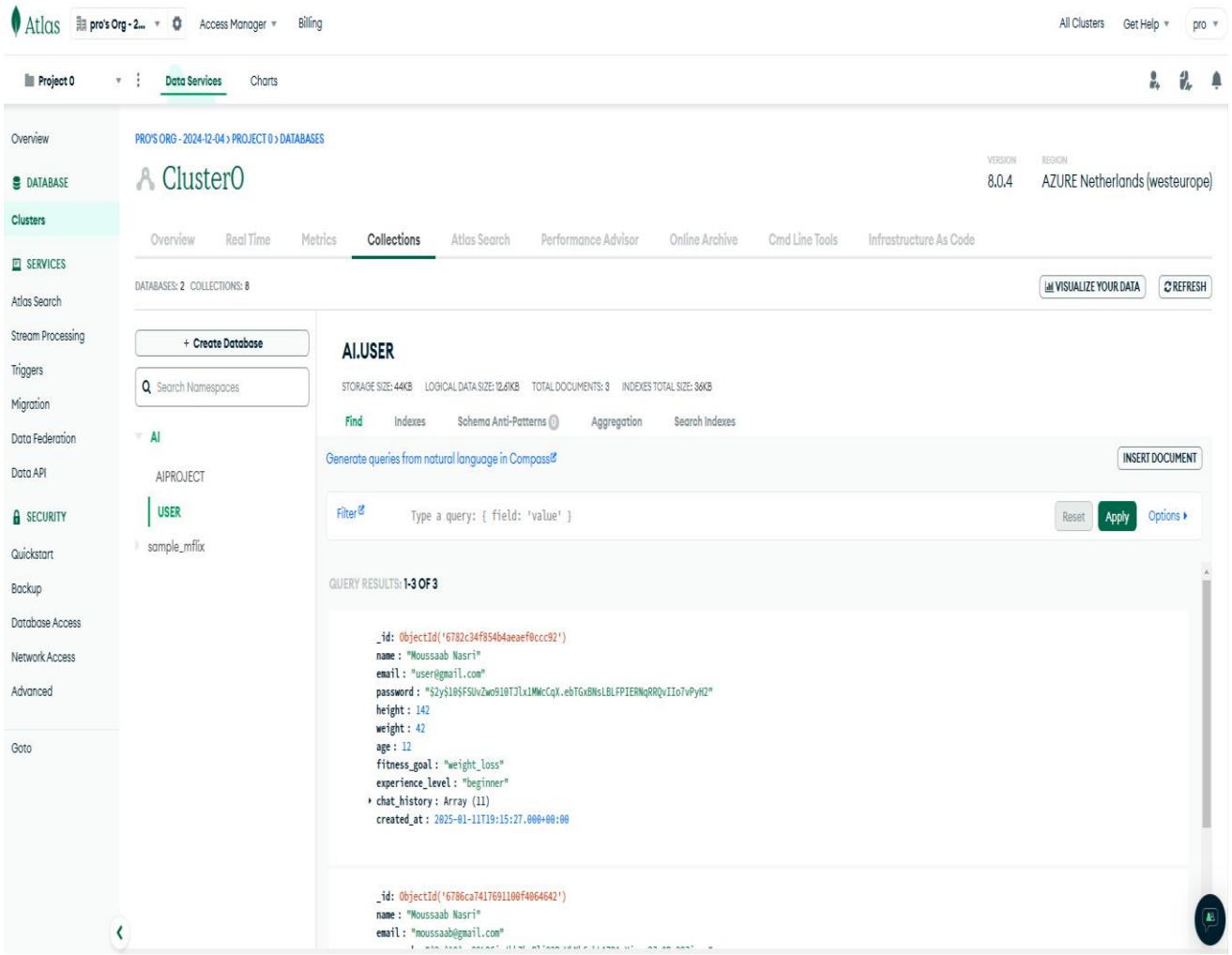
In this section, each user gets to enter his credentials showing above in the provided image including their name , email address ,password ,height (in cm) weight (in kgs) ,age ,fitness goal(bulking or cutting), Experience level .

iv. This is our Sign in form :



In this last part , each user whom created their account by using the " Sign up" form , can provide their email as well as their password to sign in .

v-MongoDB ATLAS :



vi-Perspectives

Session Management for User Identification:

To ensure personalized responses and track user history, the application implements session-based user management:

1. **Sign-In Workflow: When a user signs in, their _id from MongoDB is stored in a PHP session.**
2. **Chat History Retrieval: During interactions, the backend retrieves the user's _id from the session to fetch and update their chat history.**
3. **Personalized Responses: The AI model uses the stored history to generate context-aware responses, enhancing the user experience.**

Future Enhancements:

1. **Advanced Analytics: Incorporate data visualization for tracking progress.**
2. **Voice Commands: Enable voice-based interactions with the AI assistant.**
3. **Mobile App: Extend the functionality to a mobile platform for broader accessibility.**
4. **Integration with Wearables: Sync data from fitness trackers for more accurate recommendations.**

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vii- Challenges Encountered

Integration Issues:

- **Ngrok and PHP Communication: Establishing a seamless connection between the Flask backend (via Ngrok) and the PHP frontend required troubleshooting API endpoints and cross-origin resource sharing (CORS).**
- **Composer Setup: Managing dependencies with Composer posed initial challenges, especially with library compatibility.**

AI Model Optimization:

- **Tuning the Hugging Face model for fitness-related queries required significant experimentation to balance response quality and latency.**

Session-Based Data Management:

- **Implementing session management for retrieving and updating user-specific data in MongoDB while maintaining efficiency and security.**

Conclusion

The "AI IN SHAPE" project successfully integrates artificial intelligence into fitness and health, offering personalized workout recommendations and real-time assistance. By leveraging advanced algorithms and a user-friendly interface, the system empowers users to achieve their fitness goals efficiently. Despite challenges, the project sets a foundation for innovations in personalized fitness solutions. Future refinements will enhance its functionality, making it an indispensable tool for promoting healthier lifestyles.