ASSIGNMENT: RAG-DRIVEN DIAGNOSTIC AI ASSISTANT

Develop an AI-powered healthcare assistant that combines Retrieval-Augmented Generation (RAG) with AI Agent capabilities to provide personalized diagnostic support and medical advice.

Requirements

1. **Knowledge Retrieval and Personalization:**
   - Use the `symptoms_data.csv` dataset to build a knowledge base. The knowledge base should be designed for effective retrieval using embeddings (e.g., OpenAI Embedding or Sentence Transformers).
   - Collect patient-specific details (e.g., age, gender, known conditions).
   - Tailor diagnostic interactions and recommendations based on user profiles.

2. **Multi-Agent Collaboration:**
   - A Diagnostic Agent to narrow down possible health conditions.
   - A Recommendation Agent to provide lifestyle or medical advice.
   - An Explanation Agent to explain the reasoning behind the diagnostic outcomes.
   - Ensure seamless collaboration between these agents.

3. **Build a multi-turn dialogue system that:**
   - Starts with the user's initial symptom(s).
   - Dynamically selects follow-up questions based on retrieved context.
   - You need to use LLM(e.g., GPT-4 or Llama 3.2).

4. **UI and Usability:**
   - Build a user-friendly interface (Streamlit or web app)
   - Enable users to provide symptoms and see step-by-step diagnostic interactions.

N.B: You can use anything to make this system functionable.

Example Interaction Flow

- Initial Interaction
  User: "I have a headache."
  Diagnostic Agent: "Do you also have sensitivity to light or sound?"

- Dynamic Questioning
  User: "Yes, to light."
  Diagnostic Agent: "Have you experienced similar symptoms before? Is the pain severe and throbbing?"

- Recommendation
  Recommendation Agent: "This might be a migraine. Try resting in a dark, quiet room and consider over-the-counter pain relief. If symptoms persist, consult a neurologist."

- Explanation
  Explanation Agent: "This diagnosis is based on your symptom pattern, which aligns with typical migraine cases. Further tests might refine the diagnosis."

Submission Guidelines

Push the project to GitHub with a well-documented README file explaining the RAG pipeline, agent collaboration, and design choices.

SUBMISSION DEADLINE: 24 HOURS