
Assignment Title:
AI-Powered Chatbot for Supplier and Product Information

Objective:

Develop a chatbot that allows users to query a product and supplier database using natural language. The chatbot should interact with an open-source LLM and utilize LangGraph framework for agent workflows to fetch relevant information from a MySQL/PostgreSQL database and summarize the data using LLM.

Assignment Deliverables:

1. **Frontend (React):**
    - Create a responsive web interface to interact with the chatbot.
    - Provide a text input for users to enter their queries.
    - Display chatbot responses in a conversational format.
    - Provide a history of recent queries.
2. **Backend (Python & LangGraph):**
    - Implement a chatbot using LangGraph and Python.
    - Use LangGragh node to retrieve supplier and product information from MySQL/PostgreSQL.
    - Supplier data should be summarized using LLM
    - Use any open-source LLM (e.g., Hugging Face's GPT-2, GPT-3, or LLaMA 2) for summarization
3. **Database (MySQL/PostgreSQL):**
    - Design an efficient schema for storing:
        - Products (ID, name, brand, price, category, description, supplier ID).
        - Suppliers (ID, name, contact info, product categories offered).
    - Populate the database with sample data.
    - Implement queries to fetch relevant information based on chatbot requests.

Functional Requirements:

1. User inputs queries like:

    - "Show me all products under brand X."
    - "Which suppliers provide laptops?"
    - "Give me details of product ABC."
2. The chatbot should:
    - Fetch relevant data from the database.
    - enhance the response using context from LLM.
    - Return structured responses with relevant details.
3. The system should handle missing or incorrect queries gracefully.

Technical Requirements:

- **Backend:**
    - Python (FastAPI/Flask)
    - LangGraph for chatbot workflow
    - Open-source LLM (Hugging Face API, LLaMA 2, etc.)
- **Frontend:**
    - React (with Material UI or Tailwind CSS)
    - Axios for API calls
    - State management using Redux or Context API
- **Database:**
    - MySQL/PostgreSQL

Evaluation Criteria:

1. **Functionality:**
    - Completeness of chatbot interactions.
    - Accuracy of data retrieval and filtering.
2. **Code Quality:**
    - Clean, modular, and well-documented code.
3. **Scalability:**
    - Efficient query handling and performance.
4. **UI/UX:**
    - User-friendly design and responsiveness.

Bonus Points (Optional Enhancements):

- Implement authentication (JWT-based).
- Allow product comparisons.
- Add chatbot memory to recall user preferences.
- Include a simple analytics dashboard to track queries.

Deadline:
3 days
