Name: Teena Mandaar **Assignment:** AI/ML Engineer - Subjective Questions

1. Self-Rating (LLM, Deep Learning, AI, ML)

- **AI:** B
- **ML:** B
- **Deep Learning:** B
- **LLM:** B

("B" represents "Can code under supervision." I have hands-on experience building agents and pipelines Using guidance —as demonstrated in my code submission—and I value supervision to ensure my solutions meet enterprise-grade security and scalability standards.)

2. Key Architectural Components for an LLM-based Chatbot

To build a robust chatbot, we need to connect the "Brain" (the AI) to "Hands" (Tools) so it can perform actions and access real data, rather than just generating text.

Key Components:

- **The Orchestrator (e.g., LangChain):** This is the main application logic that connects everything. It takes the user's message and decides what to do with it.
- **The Brain (LLM):** The core AI model (like GPT-4 or Llama 3) that understands the user's intent and generates the final answer.
- **The Hands (Tools & APIs):** To be useful, the bot needs to connect to the outside world. We use APIs so the bot can fetch live data or search the web.
- **The Memory (Vector Database):** The bot needs to remember company-specific data. We use a vector database to retrieve the right documents before answering.

High-Level Approach: User asks a question -> LangChain sends it to the Vector DB to find info -> LangChain sends the Info + Question to the LLM -> LLM writes the answer.

3. Vector Databases

My Understanding: I haven't used vector databases in a project yet, but I have researched the concept. A vector database turns text into numbers (embeddings). Unlike a normal database that looks for exact word matches, a vector database looks for **similarity**. It can tell that "dog" and "puppy" are related because their numbers are close together.

Hypothetical Choice: I would choose **Pinecone**. Since it is cloud-based, I wouldn't have to manage servers myself. It is also the most popular tool for beginners learning to connect databases with LLMs like OpenAI.