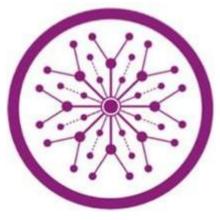
Programming for AI Lab



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Task #11

1. LangChain

A framework to help build apps using LLMs (like ChatGPT), especially when you want to connect them to real data.

- On its own, an LLM doesn't know about your files or databases.
- LangChain helps combine LLMs + external data.

Example:

You want to create a chatbot that can answer questions about your company's documents (PDFs, websites, etc.). LangChain helps you load those documents, understand them, and let ChatGPT answer questions about them.

2. RAG (Retrieval-Augmented Generation)

A method where the AI first looks up relevant information, then uses that info to generate an answer.

 LLMs can forget details or make things up. RAG keeps the answers factual and grounded.

Example:

You ask: "Tell me about the latest features of FastAPI."

Instead of guessing, the AI retrieves recent documentation, then explains it accurately.

3. LLM (Large Language Model)

A very large AI model trained to understand and generate human-like text.

- Famous examples: ChatGPT, Claude, Gemini, LLaMA.
- Write stories, answer questions, summarize articles, translate languages, write code, and more.

Example:

You type: "Explain quantum physics like I'm 5."

An LLM will break it down simply and conversationally — like a smart friend.

4. FAISS (Facebook AI Similarity Search)

A search engine for finding similar things, especially helpful when using vectors (numerical representations of text).

• It can quickly find the most similar documents to a user's input, even if the words used are different.

Example:

You have 10,000 customer reviews stored as numbers. Someone asks, "What do people think about delivery?"

FAISS helps find the most related reviews super fast.

5. Vector

A list of numbers that represents a word, sentence, or document in a way that AI understands its meaning.

• Computers don't understand language directly. Vectors let them compare meanings and find similarities.

Example:

The sentence "Dogs are great pets." is turned into numbers like [0.45, -0.33, ...] so it can be compared to "I love my puppy."

6. Vector DB (Vector Database)

A special database that stores vectors (instead of just text or numbers) and helps search them efficiently.

To find related or similar information quickly, even if it's phrased differently.

Example:

In a customer support bot, when a user asks a question, a VectorDB helps find the most similar help article — even if the exact words don't match.

7. Generative AI

Any AI that can create new content — text, images, music, videos, code, etc.

• It's not just analyzing — it's producing creative and useful content.

Example:

- ChatGPT writes blog posts or emails.
- DALL·E draws artwork from text.
- AI music tools compose background tunes.

8. GANs (Generative Adversarial Networks)

A type of generative AI where two AI models play a game — one tries to create fake data, and the other tries to catch the fake.

• This "game" helps create very realistic images, videos, or data.

Example:

A GAN can create photos of people who don't exist, or turn a rough sketch into a photorealistic image.