**Task 11**

**Syed ahmed Iqbal 087**

**1. LangChain**

* **Definition**: A framework for building applications with LLMs (Large Language Models) that supports chaining together components like prompts, memory, retrieval, and agents.
* **Use Case**: Helps build complex LLM apps like chatbots, RAG systems, agents, etc.
* **Example**: Creating a chatbot that answers questions using both a knowledge base and live API data.

**2. RAG (Retrieval-Augmented Generation)**

* **Definition**: A technique where an LLM retrieves relevant documents from an external knowledge base (often a vector database) before generating a response.
* **Use Case**: Enhances LLMs with up-to-date or proprietary information not in their training data.
* **Example**: A legal assistant LLM that fetches case law documents before answering.

**3. LLMs (Large Language Models)**

* **Definition**: AI models trained on massive text data to understand and generate human-like language.
* **Use Case**: Used in chatbots, summarization, translation, content generation, and more.
* **Example**: OpenAI’s GPT-4, Meta’s LLaMA, Google's Gemini.

**4. FAISS (Facebook AI Similarity Search)**

* **Definition**: A library for fast and efficient similarity search and clustering of dense vectors.
* **Use Case**: Often used to power search in VectorDBs by finding the most similar vectors.
* **Example**: Used in RAG to quickly find documents most relevant to a query.

**5. Vector**

* **Definition**: A numeric representation (embedding) of data, usually text, images, or audio.
* **Use Case**: Used for comparing and retrieving similar items via cosine similarity or dot product.
* **Example**: The sentence "I'm hungry" gets converted into a 768-dimensional vector for semantic search.

**6. VectorDB (Vector Database)**

* **Definition**: A database designed to store and search high-dimensional vectors.
* **Use Case**: Used in AI apps for semantic search and retrieval.
* **Example**: Chroma, Pinecone, Weaviate, and Milvus.

**7. Generative AI**

* **Definition**: A type of AI that creates new content — text, images, audio, code — from learned patterns.
* **Use Case**: Content creation, design, code generation, creative writing.
* **Example**: ChatGPT writing an article, DALL·E generating an image, or Codex writing code.

**8. GANs (Generative Adversarial Networks)**

* **Definition**: A specific type of generative model where two neural networks (generator & discriminator) compete to produce realistic outputs.
* **Use Case**: Mainly used in image and video generation.
* **Example**: Deepfake videos, AI-generated human faces.