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**🔹 1. LangChain**

* **Type**: Framework
* **Purpose**: Helps developers build applications with **LLMs** (Large Language Models).
* **Key Feature**: Chains LLMs with tools, memory, agents, and external data (like APIs or vector databases).
* **Use Case**: Question-answering apps, chatbots, RAG systems.

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

* **Type**: Architecture/Technique
* **Purpose**: Enhances LLM responses by **retrieving relevant documents** from external sources (e.g., a VectorDB) and feeding them to the LLM.
* **How it Works**:
  + **Retrieve**: Use search (often via a vector DB like FAISS).
  + **Augment**: Combine retrieved context with user query.
  + **Generate**: Pass combined input to LLM for better answers.
* **Use Case**: Chatbots that need up-to-date or domain-specific knowledge.

**🔹 3. LLMs (Large Language Models)**

* **Type**: AI Model
* **Purpose**: Generate or understand text using vast amounts of training data.
* **Examples**: GPT-4, PaLM, Claude.
* **Use Case**: Text generation, summarization, translation, code writing.

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

* **Type**: Open-source Library
* **Purpose**: Efficiently **search** through **vectors** (numerical representations of text/images).
* **Use Case**: Powering similarity search in vector databases for RAG systems.

**🔹 5. Vector**

* **Type**: Data Structure
* **Definition**: A **list of numbers** (e.g., 512-dimension float array) representing a piece of data like text or an image.
* **Generated By**: Embedding models (e.g., OpenAI, HuggingFace).
* **Use Case**: Enable similarity search by comparing vector closeness.

**🔹 6. VectorDB (Vector Database)**

* **Type**: Specialized Database
* **Purpose**: Store and retrieve vectors efficiently.
* **Supports**: Similarity search (cosine, dot-product, etc.).
* **Examples**: Pinecone, Weaviate, Chroma, FAISS.
* **Use Case**: RAG systems, recommendation engines, semantic search.

**🔹 7. Generative AI**

* **Type**: Broad AI Category
* **Purpose**: AI that can **generate new content** — text, images, audio, video.
* **Includes**: LLMs (for text), GANs (for images), diffusion models.
* **Use Case**: Writing articles, generating images, composing music.

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

* **Type**: Neural Network Architecture
* **Purpose**: Generate realistic content by training two networks (Generator and Discriminator) in opposition.
* **Used In**: Deepfake creation, synthetic image generation.
* **Different From**: LLMs (which are usually transformers), GANs are not used for text generation