**Programming for AI Lab**

**Task 11**

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Describe the Difference between:

1. Lang-Chain

2. RAG

3. LLMs

4. FAISS

5. Vector

6. VectorDB

7. Generative AI

8. GANs

* **LangChain:**
* LangChain is a framework for building applications using large language models (LLMs) and other AI tools. It allows developers to create complex, multi-step, or multi-modal systems that use LLMs to interact with data sources and APIs.
* **RAG (Retrieval-Augmented Generation):**
* RAG refers to a method where a generative model (like an LLM) is enhanced by retrieving relevant information from an external database or knowledge base (e.g., a search engine or vector database).
* **LLMs (Large Language Models):**
* LLMs are deep learning models trained on vast amounts of text data to understand and generate human language. These models (e.g., GPT-4, GPT-3) are capable of answering questions, writing text, translating languages, and much more.
* **FAISS (Facebook AI Similarity Search):**
* FAISS is a library developed by Facebook for efficient similarity search and clustering of dense vectors. It is designed to handle large-scale similarity search tasks, often used with embeddings (such as vector representations of text or images).
* **Vector:**
* In the context of machine learning and AI, a vector is a mathematical representation of data, often used to represent words, sentences, or documents in high-dimensional space. Vectors encode semantic information in a form that models can process.
* **VectorDB (Vector Database):**
* A VectorDB is a specialized database designed to store and search large collections of vector embeddings. It is optimized for similarity search, enabling quick retrieval of vectors that are similar to a query vector.
* **Generative AI:**
* Generative AI refers to algorithms and models that create new data based on patterns learned from existing data. These models can generate new text, images, audio, video, and more.
* Example Use: Text generation (GPT), image creation (DALL·E), and music generation.
* **GANs (Generative Adversarial Networks):**
* GANs are a type of generative AI model consisting of two neural networks—a generator and a discriminator—that work in opposition to create new data. The generator produces fake data, while the discriminator attempts to differentiate between real and fake data.