**Lab 11**

**Topic: Differences between Key AI and ML Terms**

1. **LangChain**
   * **Type:** Framework
   * **Purpose:** Helps in building applications using LLMs by connecting them with data sources, tools, and memory.
   * **Use Case:** Creating chatbots that read and respond based on PDFs or databases.

1. **RAG (Retrieval-Augmented Generation)**
   * **Type:** AI Technique
   * **Purpose:** Combines document retrieval with LLMs to generate more accurate and up-to-date answers.
   * **Use Case:** Answering user queries based on real-time company documents.

1. **LLMs (Large Language Models)** 
   * **Type:** AI Models
   * **Purpose:** Understand and generate human-like text using deep learning.
   * **Examples:** GPT-3, GPT-4, BERT
   * **Use Case:** Writing, translating, summarizing, answering questions, etc.

1. **FAISS (Facebook AI Similarity Search)**
   * **Type:** Open-source Library
   * **Purpose:** Efficiently searches for similar vectors from a large collection.
   * **Use Case:** Used in search engines and recommendation systems to find related documents.

1. **Vector**
   * **Type:** Data Representation
   * **Purpose:** Converts words or documents into numeric format that captures meaning.
   * **Use Case:** Comparing meaning of texts like “cat” vs. “kitten”.

1. **VectorDB (Vector Database)**
   * **Type:** Database
   * **Purpose:** Stores and searches vector embeddings (numerical representations).
   * **Use Case:** Used in RAG systems to find relevant information based on vector similarity.

1. **Generative AI**
   * **Type:** Artificial Intelligence
   * **Purpose:** Creates new content such as text, images, audio, or code.
   * **Examples:** ChatGPT, DALL·E, GitHub Copilot
   * **Use Case:** Content creation, creative design, and software development.

1. **GANs (Generative Adversarial Networks)**
   * **Type:** Generative Model
   * **Purpose:** Uses two neural networks (Generator and Discriminator) to create realistic data.
   * **Use Case:** Generating human faces, deepfake videos, or art.

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| **No.** | **Term** | **Type** | **Description** | **Use Case /**  **Example** |
| **1** | **LangChain** | Framework | Helps build applications using  LLMs by connecting them with tools and data. | Chatbot that answers based on  PDF or web data. |
| **2** | **RAG** | AI Technique | Combines retrieval of documents with LLMs to improve response accuracy. | Answers based on real-time company or academic data. |

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| **3** | **LLMs** | AI Models | Large models trained to understand and generate human-like language. | ChatGPT, GPT-4, summarizing or translating text. |
| **4** | **FAISS** | Open-source  Library | Fast search of similar vectors in large datasets. | Finding similar documents or images quickly. |
| **5** | **Vector** | Data  Representation | A list of numbers representing meaning of text, images, etc. | “Car” and  “Automobile” have similar vectors due to meaning. |
| **6** | **VectorDB** | Database | Stores and searches vector data using similarity measures. | Finds documents with similar meaning, not just keywords. |
| **7** | **Generative**  **AI** | Artificial Intelligence | AI that creates new content (text, image, music, etc.). | ChatGPT,  DALL·E, creating blog posts or digital art. |
| **8** | **GANs** | Generative  Model | Uses Generator + Discriminator to create realistic fake data. | Generating realistic human faces or deepfake videos. |