**Lab 11 Task: Differences Between Key AI/NLP Concepts**

**1. LangChain**

* **Definition**: A Python framework designed to **build applications using LLMs (Large Language Models)**.
* **Use Case**: Helps chain together prompts, memory, tools, APIs, and LLMs.
* **Example**: Building a chatbot that searches a PDF or queries a database using GPT.

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

* **Definition**: A technique that combines **retrieving external knowledge** (from documents, databases, etc.) and **generating responses** using LLMs.
* **Use Case**: Allows LLMs to answer questions with **real-time or private data**.
* **Example**: Chatbot answering questions using your custom company documents.

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

* **Definition**: AI models trained on huge text datasets to understand and generate human-like language.
* **Examples**: OpenAI's GPT, Google's PaLM, Meta's LLaMA.
* **Use Case**: Text generation, summarization, Q&A, translation, coding.

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

* **Definition**: An open-source library by Facebook for **fast similarity search and clustering** of vectors.
* **Use Case**: Helps search for the most similar text embeddings or images.
* **Example**: Retrieving top similar paragraphs from a large dataset.

**5. Vector**

* **Definition**: A **numerical representation** of data (e.g., text, image, audio) that preserves meaning.
* **Use Case**: Used in ML/AI for comparisons, similarity, and clustering.
* **Example**: “How are you?” → [0.12, 0.45, ..., 0.98]

**6. VectorDB (Vector Database)**

* **Definition**: A database specifically designed to **store and query vector embeddings** efficiently.
* **Examples**: Pinecone, Weaviate, Chroma, Qdrant.
* **Use Case**: Used in RAG pipelines to fetch relevant chunks of data via similarity search.

**7. Generative AI**

* **Definition**: AI that can **generate new content** (text, images, code, music, etc.) rather than just analyze data.
* **Examples**: ChatGPT (text), DALL·E (images), Copilot (code).
* **Use Case**: Story writing, art generation, content creation.

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

* **Definition**: A class of **deep learning models** with two neural networks (Generator and Discriminator) that compete to produce realistic data.
* **Use Case**: Generating synthetic images, faces, art, etc.
* **Example**: Creating realistic human faces that don’t exist.