Operating System Lab

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# Lab task 11

1. **LangChain**

**What it is:** A framework to **build apps using LLMs** (like ChatGPT) in a modular way.

**Use case:** Think of it as the “workflow manager” for AI

— lets you chain prompts, tools, memory, etc., to make LLMs smarter and more interactive.

**Analogy:** LangChain = Jarvis for LLMs. It organizes and orchestrates AI steps behind the scenes.

# RAG (Retrieval-Augmented Generation)

**What it is:** A technique where you **retrieve external knowledge** (like from a PDF or DB) and feed it into the LLM to generate better, more accurate answers.

**Use case:** Useful when LLMs don’t know specific or up- to-date stuff.

**Analogy:** RAG = Like giving your AI cheat sheets before an exam.

# LLMs (Large Language Models)

**What it is:** AI models trained on huge amounts of text to understand and generate human-like language.

**Examples:** GPT-4, LLaMA, Claude.

**Analogy:** LLM = Super-smart parrot that actually *gets*

what you’re saying and responds with crazy accuracy.

# FAISS (Facebook AI Similarity Search)

**What it is:** A library to **search for similar vectors** really fast — like nearest neighbor search on steroids. **Use case:** Used in vector databases to quickly fetch relevant info for RAG setups.

**Analogy:** FAISS = Google Maps for AI memory — “find me what’s closest to this!”

# Vector

**What it is:** A numeric representation of data (like text) in multi-dimensional space.

**Why it matters:** Helps the AI understand how similar different pieces of text are.

**Analogy:** Vector = Coordinates of meaning in AI-land.

“Apple” and “fruit” will have vectors close to each other.

# VectorDB

**What it is:** A database that stores vectors (a.k.a. embeddings) and lets you **search by similarity**.

**Examples:** Pinecone, Weaviate, Chroma, Milvus. **Analogy:** VectorDB = AI’s long-term memory, but with vibes. It remembers and finds stuff based on *meaning*, not exact words.

# Generative AI

**What it is:** Any AI that can **create stuff** — text, images, music, code — based on input prompts.

**Tools:** ChatGPT, DALL·E, Midjourney.

**Analogy:** Generative AI = The creative cousin of AI

that’s always making memes, stories, or beats.

# GANs (Generative Adversarial Networks)

**What it is:** A generative AI technique where **two neural networks battle** — one generates, one critiques — to create super realistic outputs.

**Used in:** Deepfakes, art generation, image upscaling. **Analogy:** GAN = AI’s internal “Shark Tank” — one AI pitches, the other roasts, and they both get better.