LEAP

APPLIED AI

🦜🔗

LangChain Introduction

16 February 2024

Learning & Exploration of AI Practices

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A quick challenge

01

Think of the primary limitations in current LLM’s

A quick challenge

You are all correct!!

What is LangChain?

LangChain is an open-source **framework** that lets you:

- Turbocharge LLM’s Understanding
- Guide LLM’s responses
- Simplify creating Generative AI application interfaces

What is LangChain?

Analogy

Think of it as recipe book, offering various components for diverse dishes (*Applications*).

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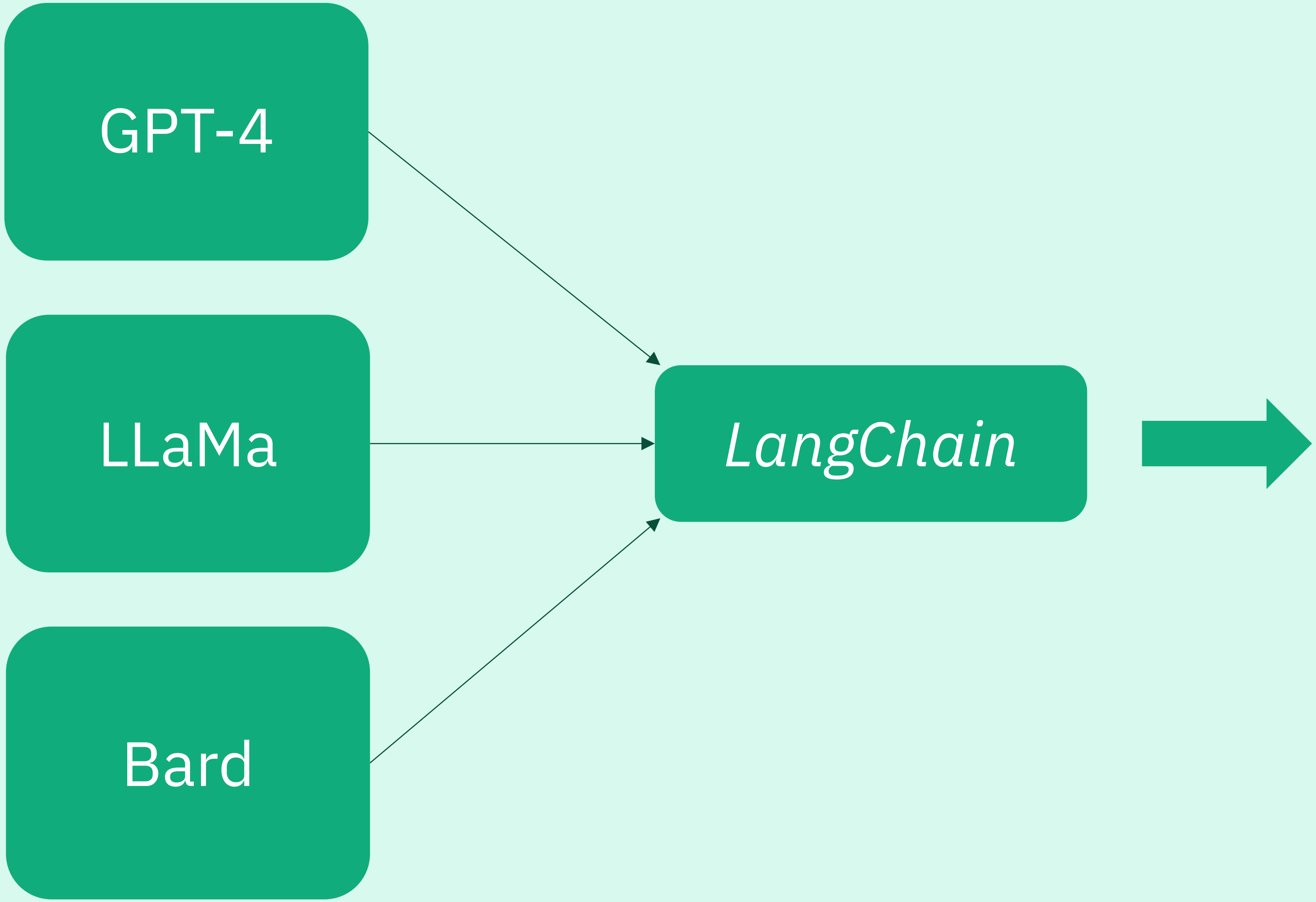


GPT-4

LLaMa

Bard

LangChain

Cool AI projects

What is LangChain?

LangChain combines powerful LLMs like OpenAI’s GPT-3.5 and GPT-4 with external data sources.

In our case,

The data source is a **PDF**.

Need for LangChain

07

LangChain empowers agents to stay updated.

It overcomes knowledge gaps in LLMs.

It enhances context understanding.

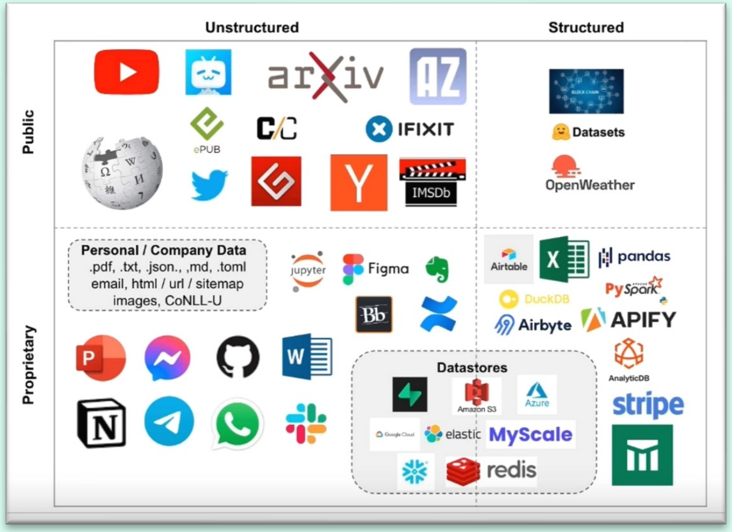
Need for LangChain

Langchain enables the integration of domain specific expertise thereby improving capabilities of AI and LLM's in specialized areas.

It's like giving your AI a *cool new suit* for every mission, ensuring it's always ready to conquer.

Document Loaders are software components responsible for loading and processing documents or datasets into a format suitable for analysis or use within a system or application.

For example, there are document loaders for loading a simple .txt file, for loading the text contents of any web page, or even for loading a transcript of a YouTube video.



Embeddings

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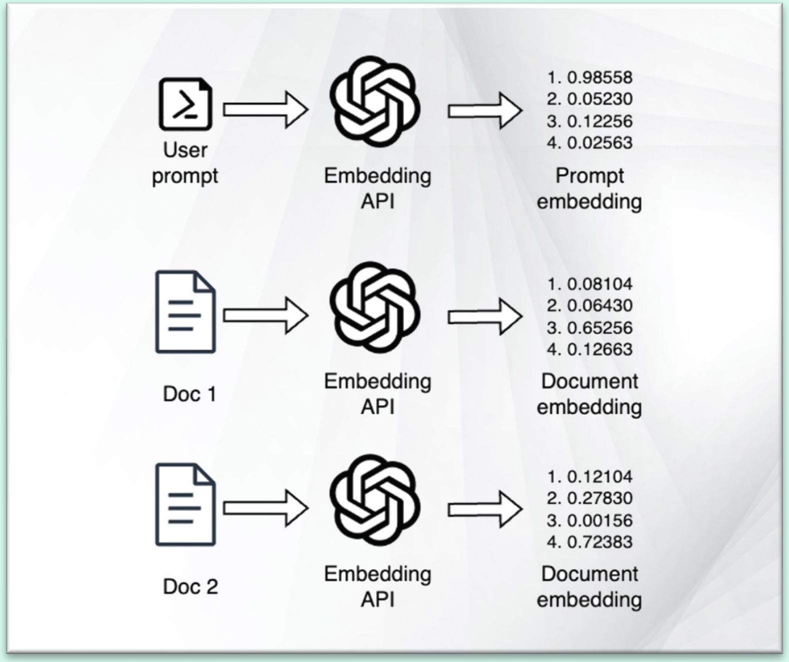
They are numerical codes that represent words, phrases, or documents in a way that computers can understand, making it easier for them to analyze and process language-related tasks

Embeddings represent words, phrases, or documents as vectors of numbers.

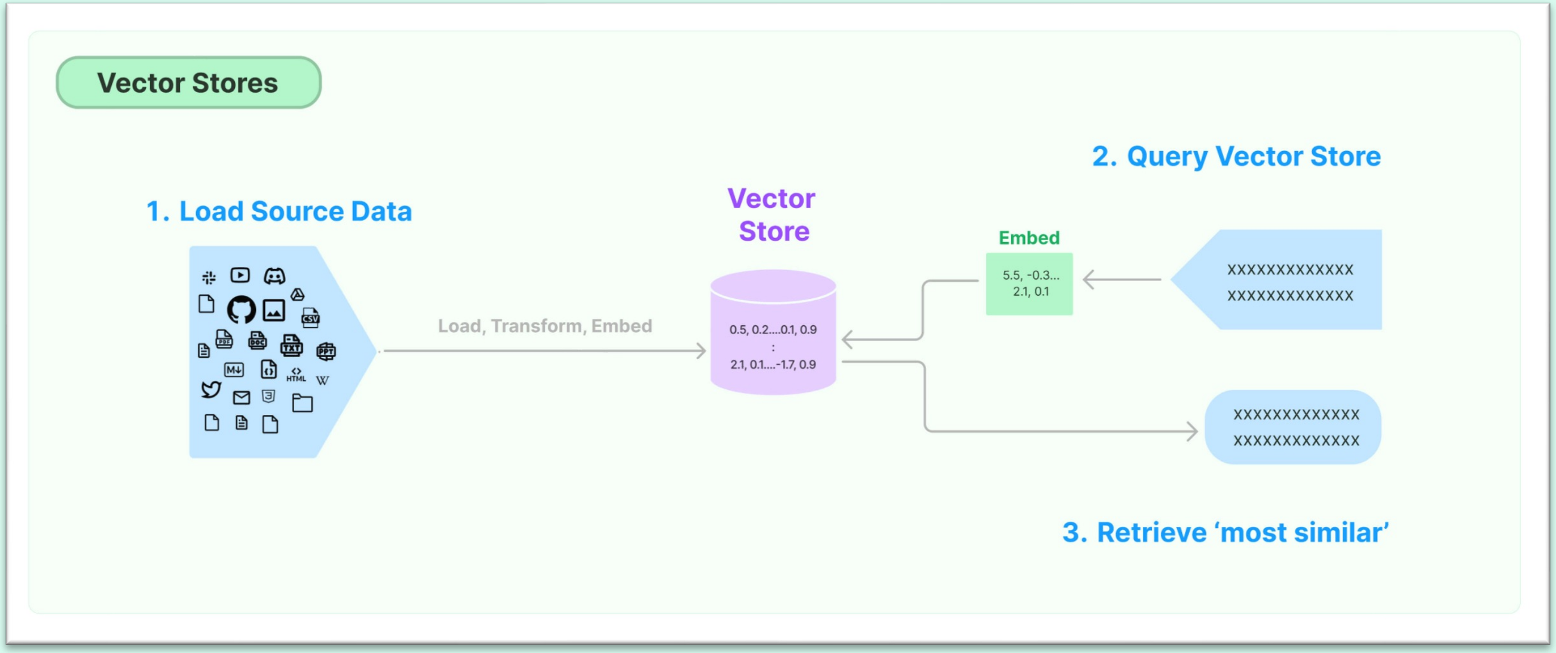
They capture semantic relationships between words, allowing computers to identify similarities, differences, and context within language data.

Words with similar meanings or contexts are often closer together, such as "cat" and "dog," or "happy" and "joyful."



Vector Stores

Databases where information is stored in the form of numerical vectors. Each piece of data, such as words, phrases, or documents, is represented by a vector of numbers, typically in a high-dimensional space.



Prompts are predefined cues or instructions to guide users in formulating queries or requests.

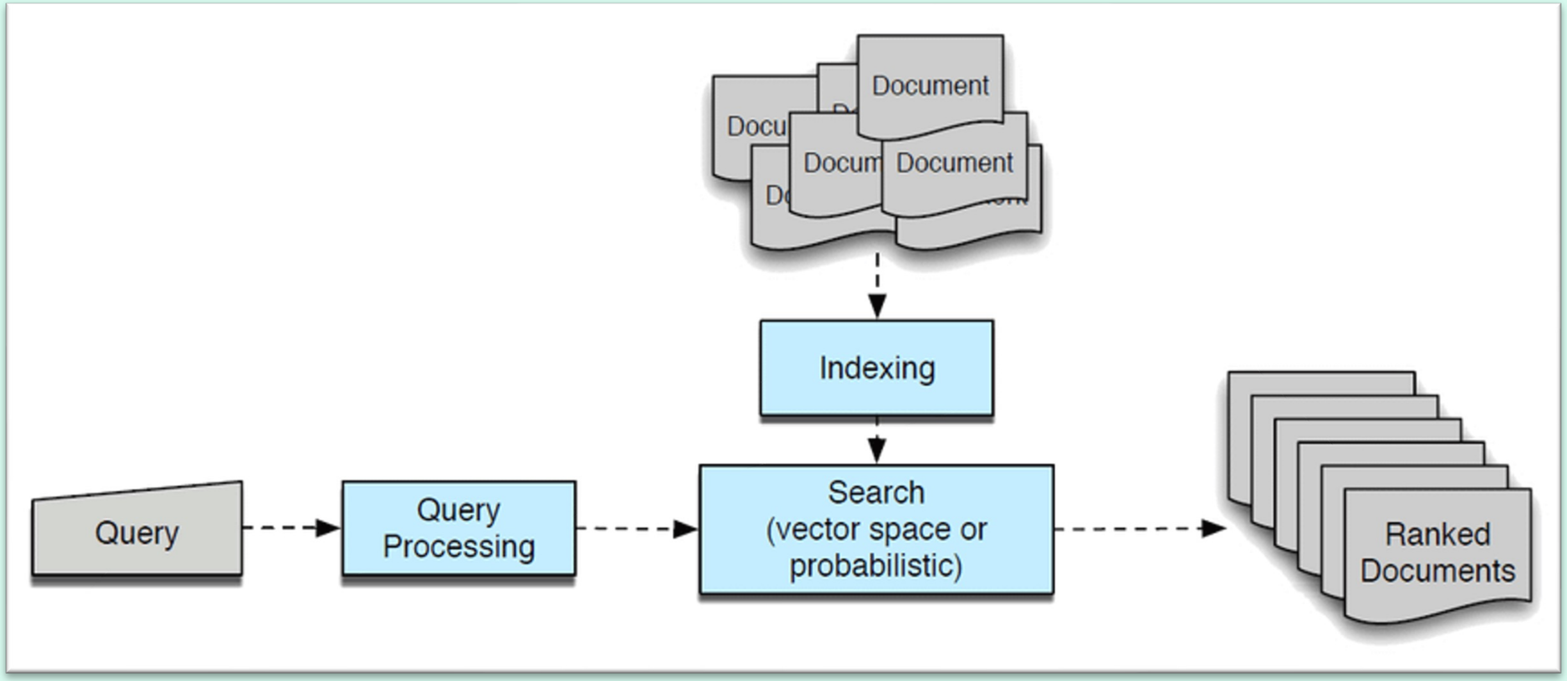
Suppose you're running a bakery business that uses LangChain to respond to order queries.

Some prompts could be: "**Please track my order**" *or* "**Add special instructions to my order**”.

Retrieval

It is the process of accessing and extracting relevant information from the model's knowledge base in response to user queries or prompts.

For example,



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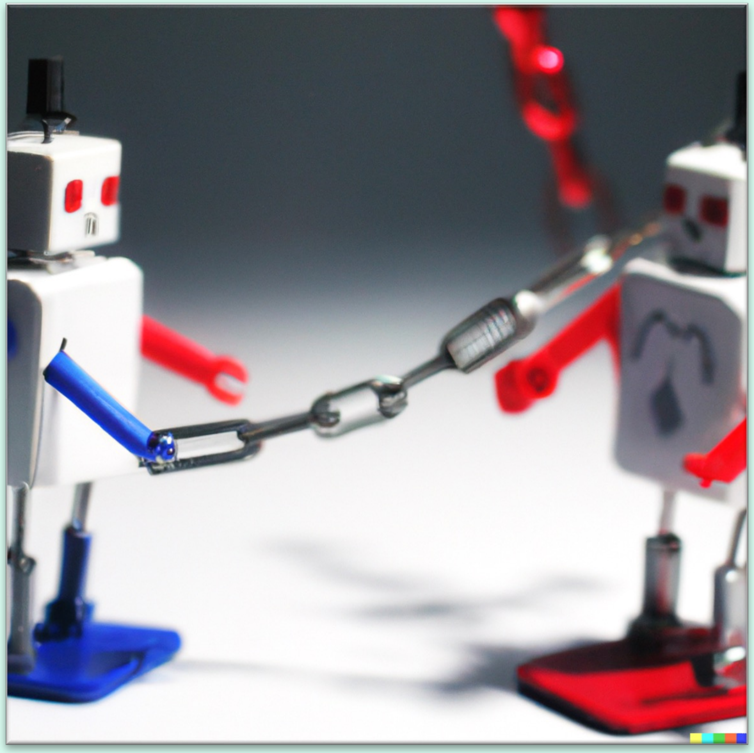
Chains ⛓️



Chains are what you get by connecting one or more large language models (LLMs) in a logical way

*Just like you connect an **if** with a series of **else-if** conditions to make a conditional logic...*

*Just like you connect **different LEGO pieces** to build a model…*

One after the other…

Utility Chains

These are **specialized chains**, comprised of many LLMs to help solve a specific task.

Some of them are end-to-end, like the ***AnalyzeDocumentChain***
(summarization, QnA)

And some are specific, like the ***PALChain***
(reads complex math problems and generates programs for solving them)

Agents

Agents in LangChain are built to ***interact*** with the ***real world***.

LLMs ← .... → Real World Tools

(Weather API, Google Search,
Math Calculator, etc.)

Memory

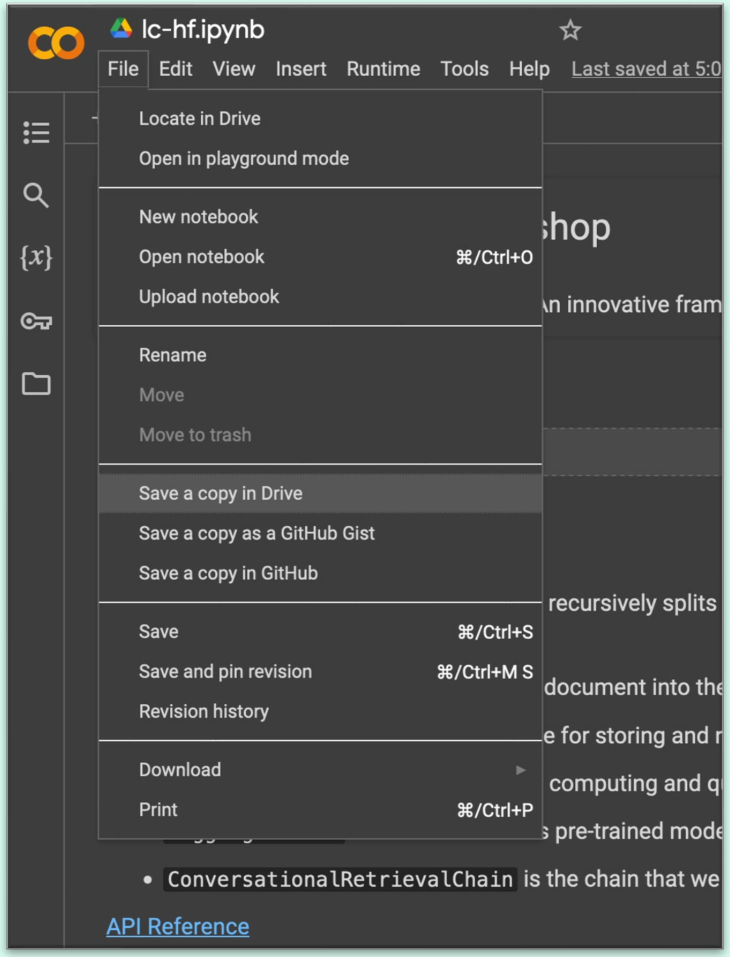
Conversational memory is how a chatbot can respond to multiple queries in a chat-like manner.

Without it, every query would be treated as an entirely independent input without considering past interactions.

Let’s test this…

Colab Notebook

- Like before, go to **leap-ai.tech**
- Click the Colab Notebook link
- Go to File -> Save a copy in Drive



And we are done!

P.S. Check out the Post Workshop Content!

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