

# LLM Agents

Concepts | Examples | Code Demo



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# Today's Talk

**1. LLMs and their use**

**2. Agents**

**3. Types of Agents**

**4. Single Agent Demo**

# 1. LLMs and their use

**LLM: Large Language Model**

**Commonly used LLMs:**

**GPT-4o, GPT5.2**

**Llama3.2**

**Claude**

# 1. LLMs and their use

**LLM Deployments in the wild**

**In-Context Learning (ICL)**

**RAG**

**LoRA Fine-Tuned Model**

# 1. LLMs and their use

## In-Context Learning

Useful when all of the **context** needed by LLM to respond to a **query** can fit into the **context window** of the LLM

# 1. LLMs and their use

**RAG**

**Help provide context through a large corpus of documents, which can be selectively filtered to the particular query and passed as context to the LLM**

# 1. LLMs and their use

## LoRA Fine-Tuned Model

Useful when we need to **domain adapt** an LLM for a specific task. Base LLM **fine-tuned** on **domain-specific examples**. With smaller LLMs and simpler tasks, can be **lower latency**

## 2. Agents

What are **Agents**?

**Agents** are **LLM systems** that can work with **tools** and a **base LLM model** to iteratively and in a step-by-step manner reason through information to arrive at an answer

# 2. Agents

## Agent Components

**LLM Model**  
**Tools (environment or APIs)**  
**Instructions**

## 2. Agents

When use **Agents**?

**When the tasks are complex enough that they need to be broken down into multiple steps and a single API call of an **LLM** won't suffice for the task!**

## 2. Agents

Example use-case for **Agents**

Given a **topic**, summarize news on a that **topic** in the past one month. Assume that there are **multiple news APIs** to choose from depending on the topic.

## 2. Agents

When **not to** use **Agents**?

When the task can be subsumed into a **single LLM call** with appropriate prompt and a **context** and/or Retrieval through a **RAG**.

## 2. Agents

Example use-case for **not using Agents**

Given a **topic**, summarize news on a that **topic** in the past one month from a **specific news API**

# 3. Types of Agents

**By Modality**

- Data Agents**
- Action Agents**
- Orchestration Agents**

# 3. Types of Agents

**By Application**

- Coding Agents**
- Weather Agents**
- Fintech Agents**

# 3. Types of Agents

**By Complexity**

**Single Agent Systems**  
**Multi-Agent Systems**

# 3. Types of Agents

**Single Agent Systems**

**LLM Model**

**Multiple Tools**

**Instructions for each Tool**

**Looping module until termination**

# 3. Types of Agents

**Multi Agent Systems**

**LLM Model**

**Multiple Agents**

**Instructions for each Agent**

**Handoff capabilities between Agents**

**Triaging/Master Agent**

# Cost Considerations

**Deployment Considerations**

**Cost**

**Latency**

**Accuracy**

**Privacy**

**Complexity**

**Where are agents used in the industry?**

# 4. Single LLM Agent Demo

# References

1. <https://cdn.openai.com/business-guides-and-resources/a-practical-guide-to-building-agents.pdf>
2. [https://www.techrxiv.org/users/1000434/articles/1360836/master/file/data/LLM\\_Agent\\_Tutorial/](https://www.techrxiv.org/users/1000434/articles/1360836/master/file/data/LLM_Agent_Tutorial/)