Introduction to Agents, Agentic Supervisors and Agentic RAG

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# Workflows and Agents

Distinction between workflows and agents

From [1]:

*Workflows are systems where LLMs and tools are orchestrated through predefined code paths.*

*Agents, on the other hand, are systems where LLMs dynamically direct their own processes and tool usage, maintaining control over how they accomplish tasks.*

When and when not to use agents

From [1]:

*When building applications with LLMs, we recommend finding the simplest solution possible, and only increasing complexity when needed. This might mean not building agentic systems at all. Agentic systems often trade latency and cost for better task performance, and you should consider when this tradeoff makes sense.*

*When more complexity is warranted, workflows offer predictability and consistency for well-defined tasks, whereas agents are the better option when flexibility and model-driven decision-making are needed at scale. For many applications, however, optimizing single LLM calls with retrieval and in-context examples is usually enough.*

A diagram of a workflow

AI-generated content may be incorrect. Figure 1: Visualizing the difference between Workflows and Agents

## Building block: The augmented LLM

The basic building block of agentic systems is an LLM enhanced with augmentations such as retrieval, tools and memory. The current LLMs actively use these capabilities , generating their own search queries, selecting appropriate tools, and determining what information to retain.

A diagram of a process

AI-generated content may be incorrect.

Figure 2: Building an augmented LLM

## Workflow: Prompt chaining

Prompt chaining decomposes a task into a sequence of steps, where each LLM call processes the output of the previous one. One can add programmatic checks (aka gates) on the intermediate steps to ensure the process is progressing as expected.

A diagram of a flowchart

AI-generated content may be incorrect.

Figure 3: The prompt chaining workflow

When to use such workflow:

This workflow is used when the task can be easily decomposed into fixed list of subtasks.

# Building a Research Agent

# Multi-agent supervisor

# References

[1] <https://www.anthropic.com/engineering/building-effective-agents>

[2] <https://langchain-ai.github.io/langgraph/tutorials/workflows/#agent>

[3] <https://langchain-ai.github.io/langgraph/tutorials/multi_agent/agent_supervisor/>

[4] <https://langchain-ai.github.io/langgraph/tutorials/rag/langgraph_agentic_rag/>

[5] <https://academy.langchain.com/courses/take/deep-research-with-langgraph/>

[6] <https://github.com/langchain-ai/deep_research_from_scratch>