





Beyond Chatbots Intro to Agentic Applications

Simon Stone

Research Software Engineer for HPC and AI

Research Computing @ ITC, Dartmouth College



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Overview FAQ

ANTHROPIC

The search agent hub for your work

Google Agentspace securely access your applications to quickly need—making you more impactful at work.

With Claude, you agents that plan more effectively

Start building

Curricular Explorer x

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When is BIOL 12 this term?

BIOL 12, "Cell Structure and Function," is offered in two time periods this Spring term:

- 1. Time Period 10:**
 - **Lecture:** 10:10 am - 11:15 am on Monday, Wednesday, and Friday
 - **X-hour:** 12:15 pm - 1:05 pm on Thursday
 - **Instructor:** Dipon D. Ghosh
- 2. Time Period 9L:**
 - **Lecture:** 8:50 am - 9:55 am on Monday, Wednesday, and Friday
 - **X-hour:** 9:05 am - 9:35 am on Thursday
 - **Instructor:** George E. Schaller

You can choose either of these time periods based on your schedule preferences. Let me know if you need more information or if you would like to discuss other courses!

End conversation

Used search_sql_course_catalog

Used get_time_period

Type your message here... →

ACE can and will make mistakes. Always verify information, especially any required prerequisites, in the [ORC](#), the [timetable](#), or the [department websites](#). Remember to always consult with your faculty advisor or undergraduate dean before acting on course recommendations.



What we will cover in this session

💡 What is Agentic AI?

🤔 How do AI Agents work?

❗ What are their strengths and limitations?

🛠 How can I create my own agents?

🔮 What is next in Agentic AI?



Agentic Artificial Intelligence

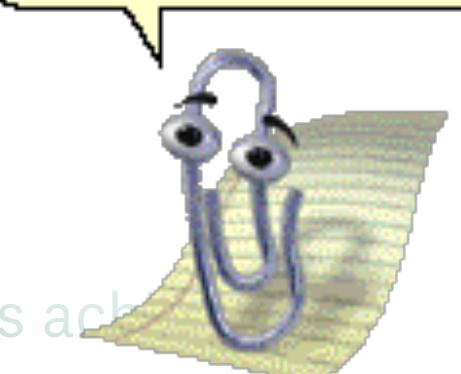
- 🧠 Agentic Artificial Intelligence can *act autonomously* without intervention
- 🤖 An AI Agent is a concept describing a system that can:
 - 🤔 Decide on the next action(s) to take to achieve a stated goal
 - 💪 Execute those actions
 - Adapt to changes in its environment to continue until the goal is achieved
- 🚀 Large Language Models (LLMs) have huge potential for AI Agents

It looks like you're writing a letter.

Would you like help?

- Get help with writing the letter
- Just type the letter without help

Don't show me this tip again





Agentic Applications

🧠 Agentic Applications involve agents that can act without human intervention.

🤖 An AI Agent

🤔 Decide on a goal

💪 Execute the plan

💡 Adapt to changes

🚀 Large Language Models (LLMs) have huge potential for AI Agents





Large Language Models and AI Agents

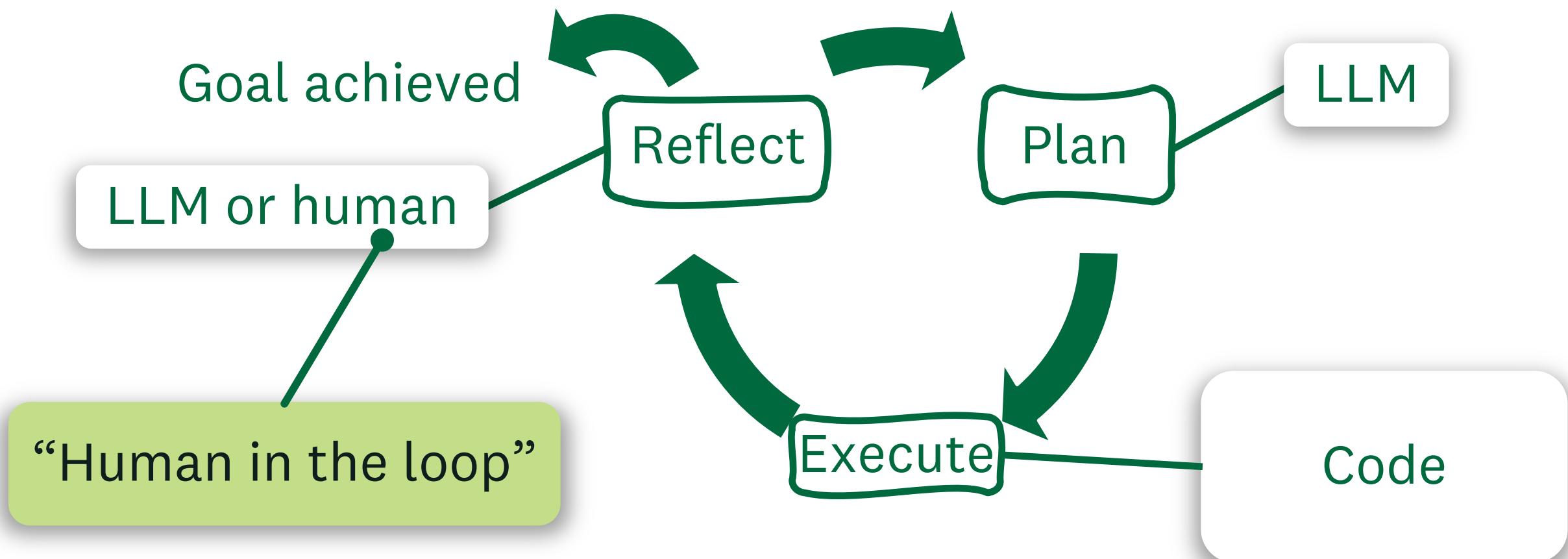
- 🤔 Decide on the next action(s) to take to achieve a stated goal
 - 👉 Execute those actions
 - ✅ Adapt to changes in its environment to continue until the goal is achieved
-
- ```
graph LR; A[Decide on the next action(s) to take to achieve a stated goal] --> B[Execute those actions]; B --> C[Adapt to changes in its environment to continue until the goal is achieved]; A --> D["LLM can talk itself through the decision-making process"]; B --> E["LLM-generated code can be executed to perform actions"]; C --> F["The result of the code can be described to the model as text (or image, if multimodal LLM)"]
```



# Demo in Dartmouth Chat

- Naïve approach: Let the model write all the code
- Improved approach: Tell the model which functions it can call

# The Agentic Loop





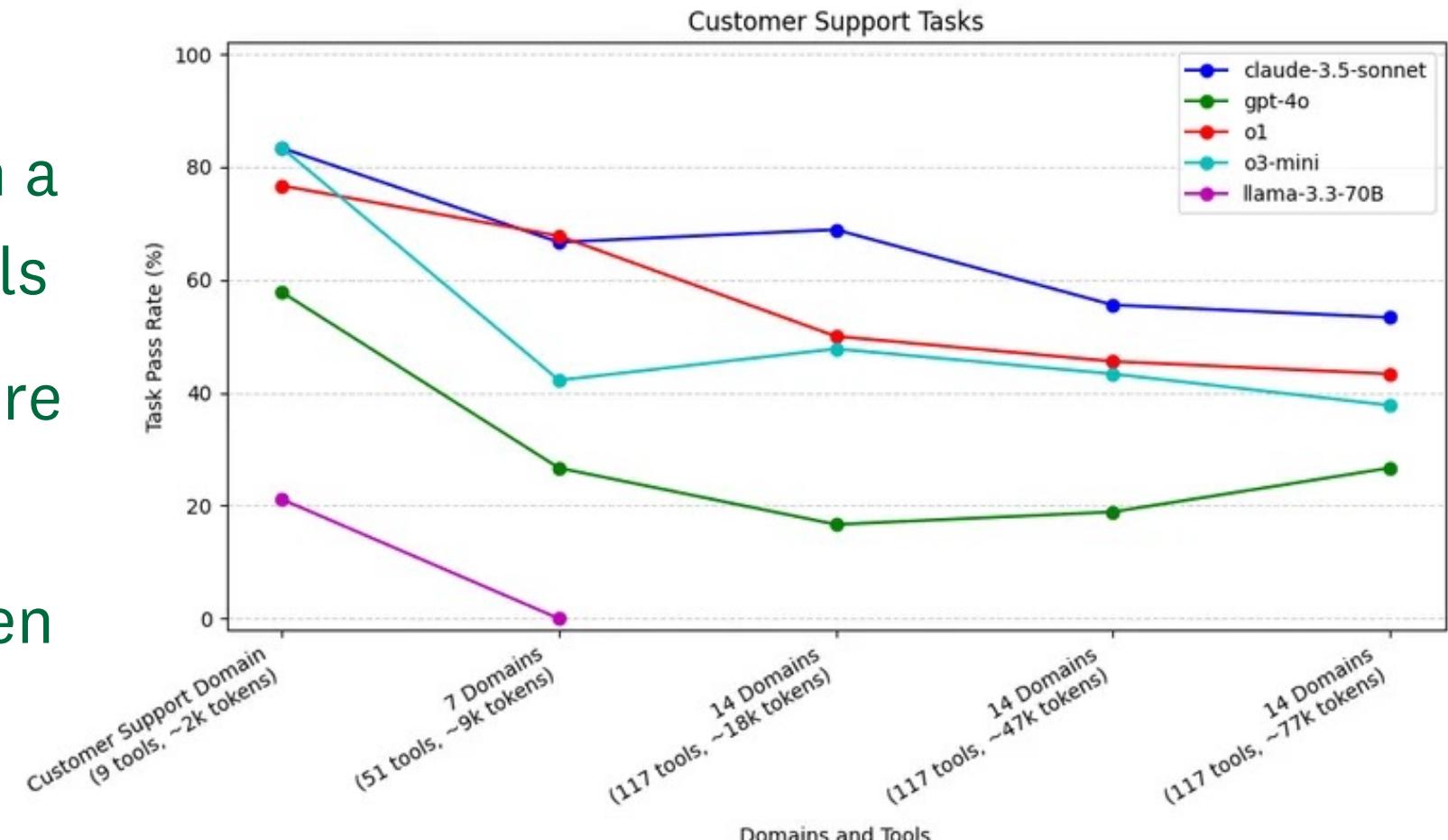
# The Agentic Loop LangChain Examples

- Manual function calling / tool use
- Automated feedback loop



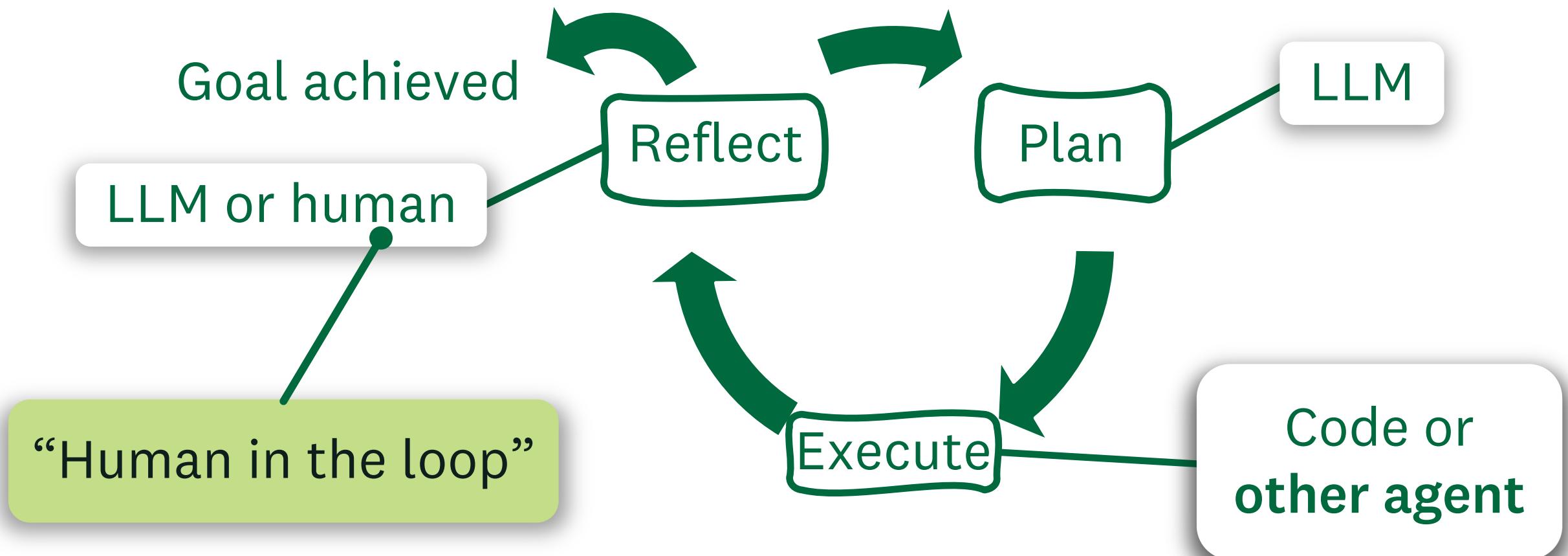
# The Agentic Loop Limitations

- 🛠 Agents are best with a small number of tools
- 👤 Complex tasks require multiple agents
- 🌐 Coordination between agents becomes a challenge



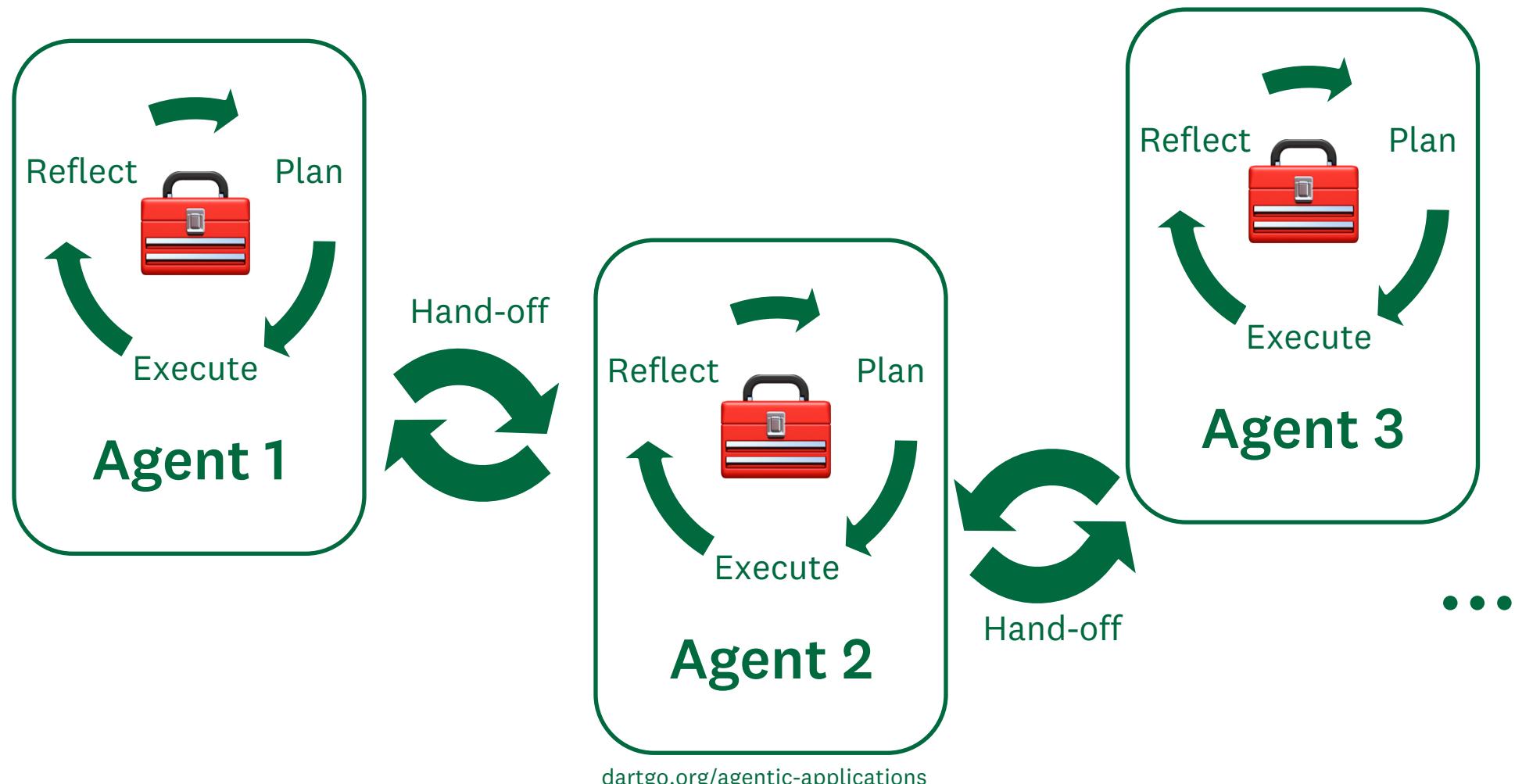
Source: <https://blog.langchain.dev/react-agent-benchmarking/>

# The Agentic Loop



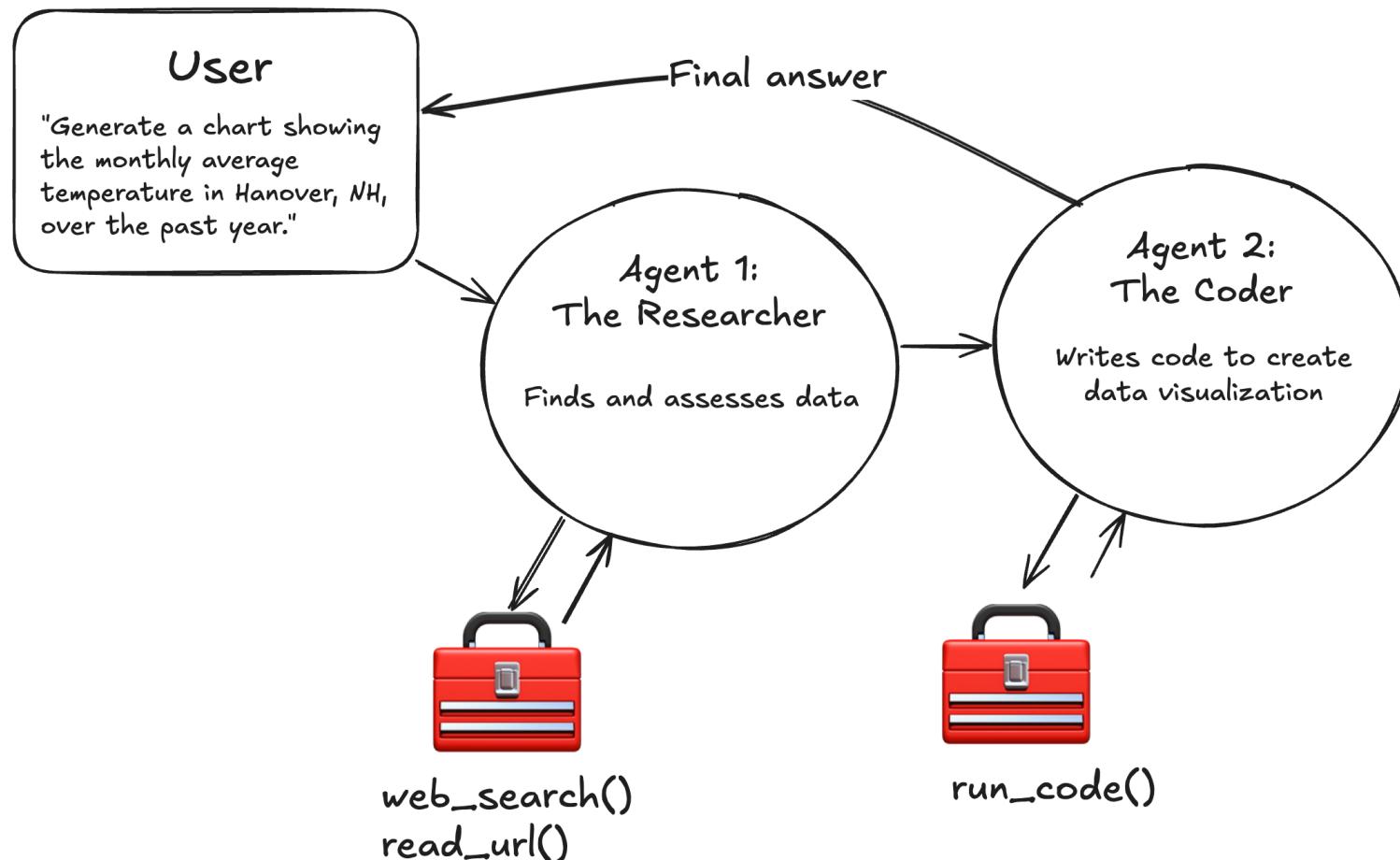


# Multi-Agent Application



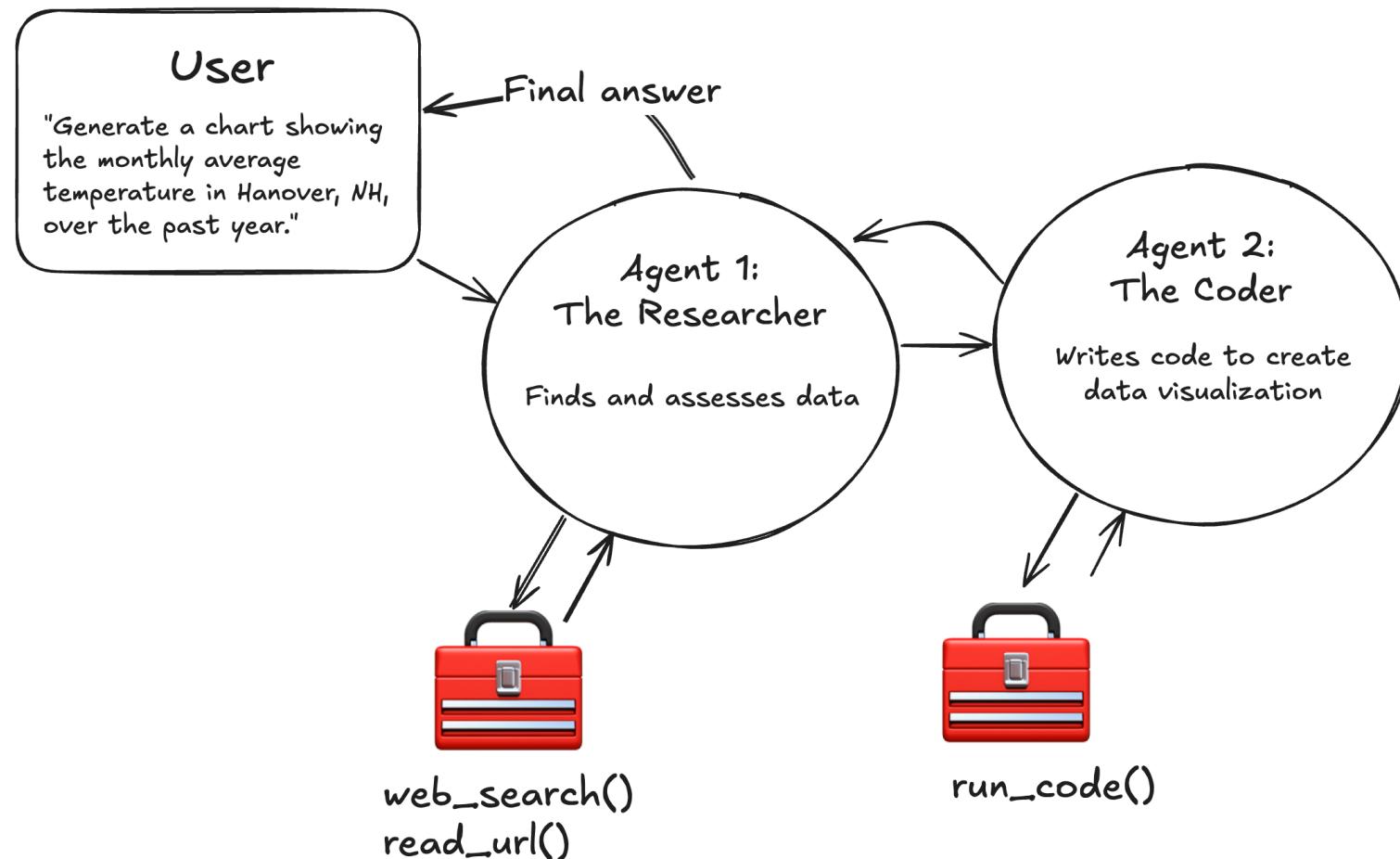


# Multi-Agent Application Example Architectures: The Chain of Specialists



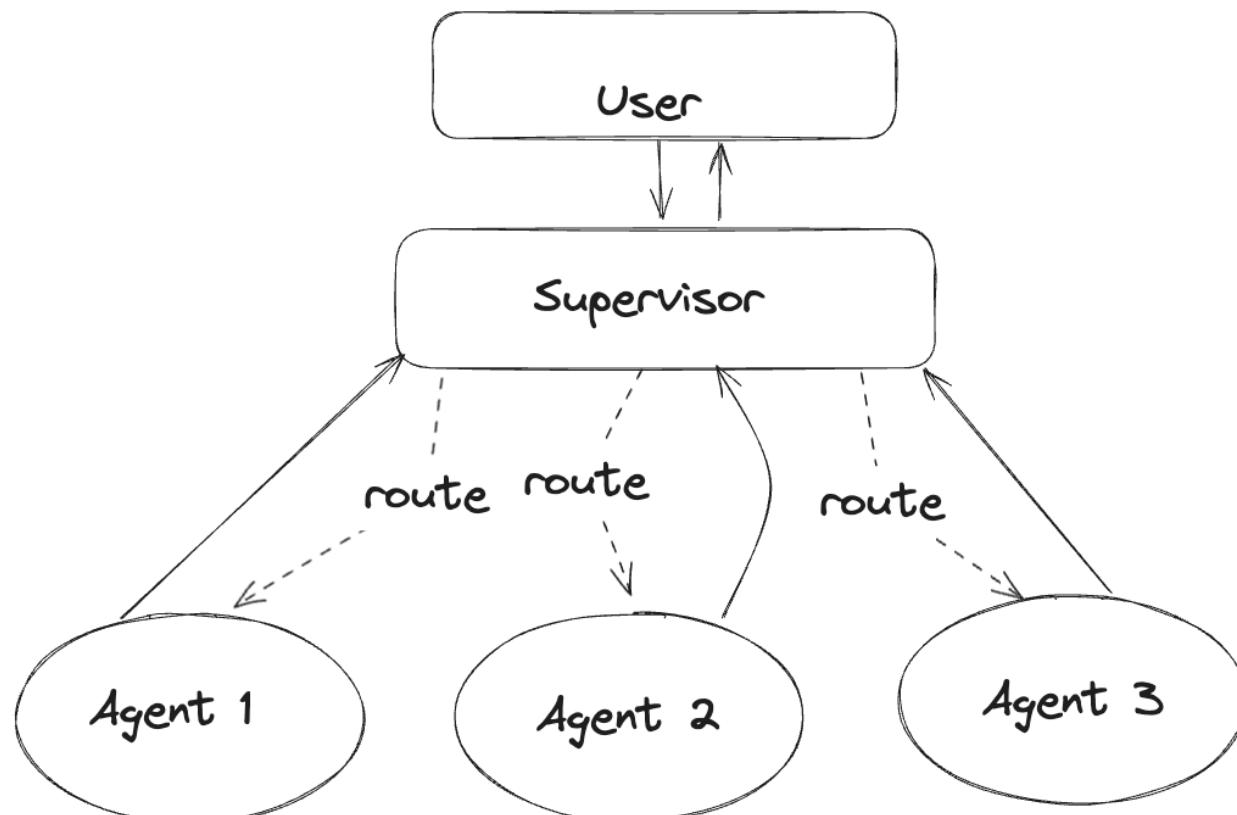


# Multi-Agent Application Example Architectures: The Network of Specialists





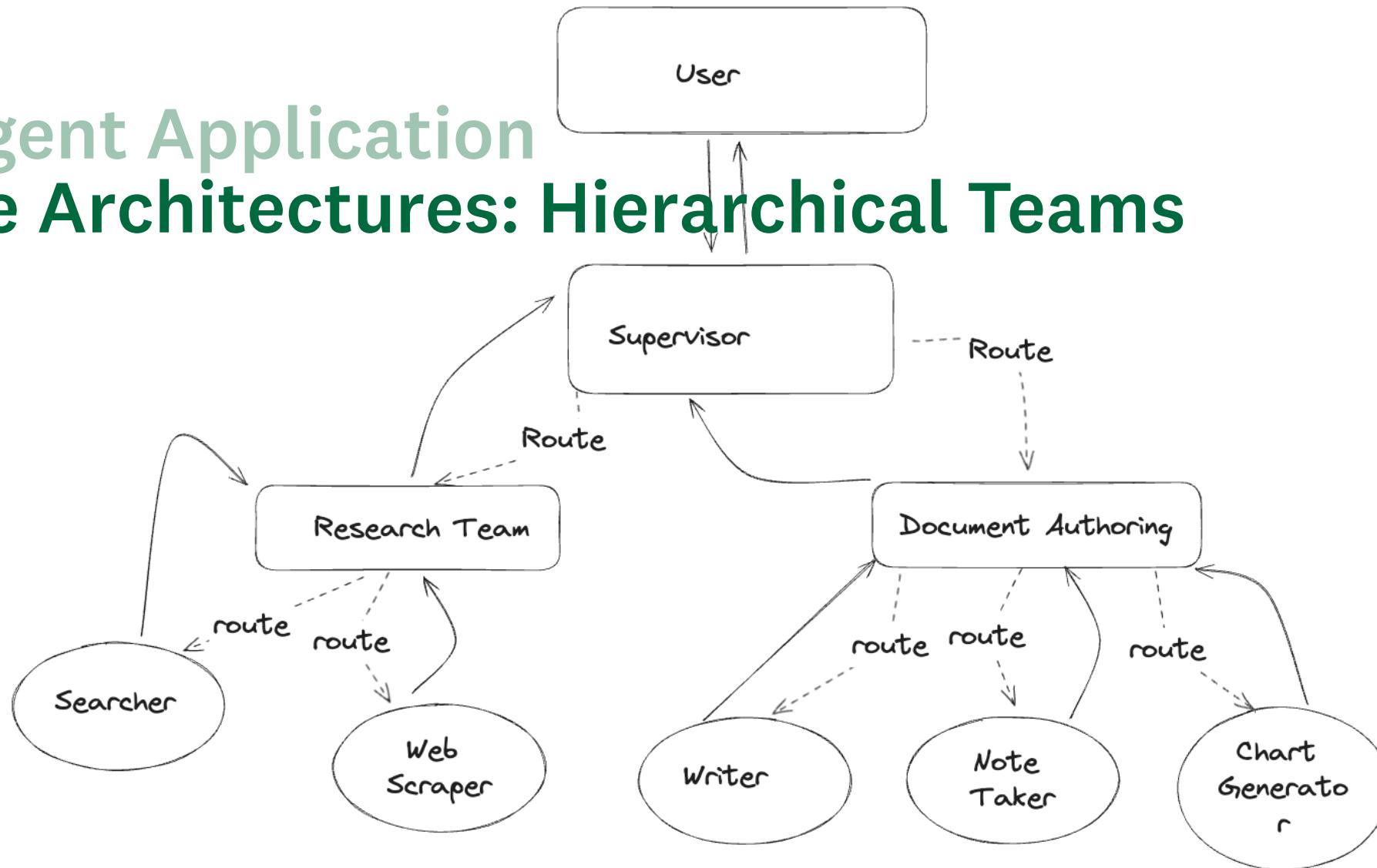
# Multi-Agent Application Example Architectures: The Supervisor



Source: <https://blog.langchain.dev/langgraph-multi-agent-workflows/>



# Multi-Agent Application Example Architectures: Hierarchical Teams



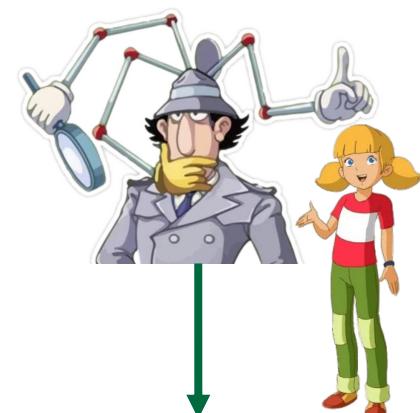


# Multi-Agent Application LangGraph Example



# Highly scientific benchmark of current Agentic AI

- Tool use sometimes suboptimal
- Often still gets the job done
- Better with a human-in-the-loop



Bumbling chaos agent



Ruthlessly effective



# Current trends in Agentic AI

## Model Context Protocol:

Standardized way to make tools and resources available to LLMs

## llms.txt:

Standardized way to provide information about a website's structure to an LLM agent

## Agents on the Edge:

Smaller LLMs with improved, on-device agentic capabilities



# Summary

- 💡 Agents are LLMs that can interact with the “real world”
- 🔧 Interactions are facilitated through functions (i.e., executable code)
- 👥 Complex tasks require multiple agents
- 🤔 Finding the best architecture can be challenging (agent orchestration)
- 📈 Agentic AI is still in its infancy, but steadily getting more capable



# Next Steps

- 🔍 Try out some agentic applications and try to infer the underlying architecture
- 🎓 Explore LangChain, LangGraph, Pydantic AI, or other agentic frameworks
- 👉 Create your own agentic app or reach out to [research.computing@dartmouth.edu](mailto:research.computing@dartmouth.edu) and we can help!



# Thank you

[dartgo.org/agentic-applications](http://dartgo.org/agentic-applications)