

GenAI Hack Session

# Agentic Frameworks for GenAI Applications

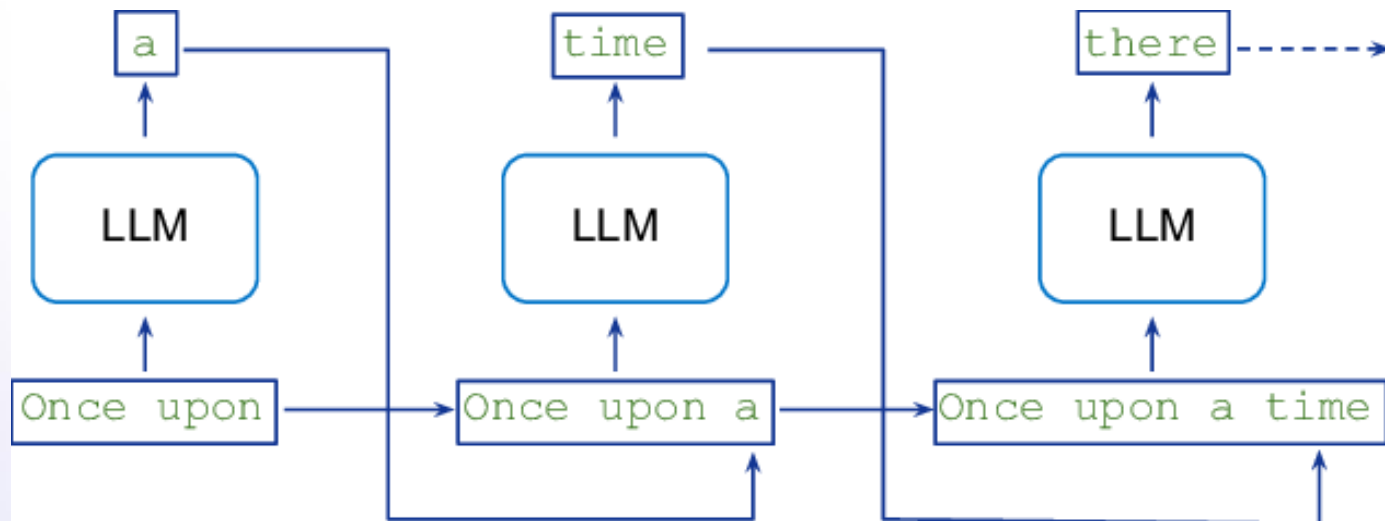
## Speaker

Sudalai Rajkumar @ SRK  
AI Innovations, Tiger Analytics

# Why Agents?

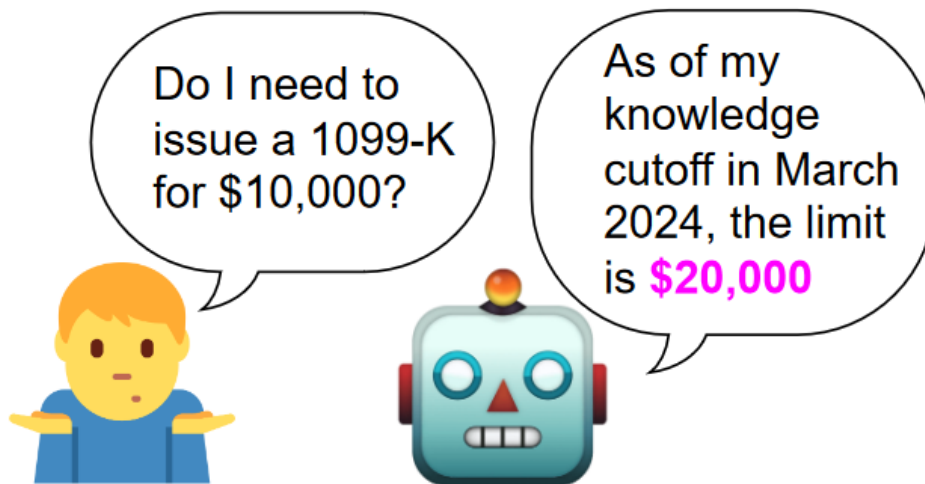
# Why Agents?

- LLMs work in zero shot mode, prompting the model to generate tokens without revisiting its work



# Why Agents?

- LLMs are limited by its internal knowledge



# Why Agents?

- Inability to perform any actions like code execution



Write a function that checks if a number is a prime number in Javascript

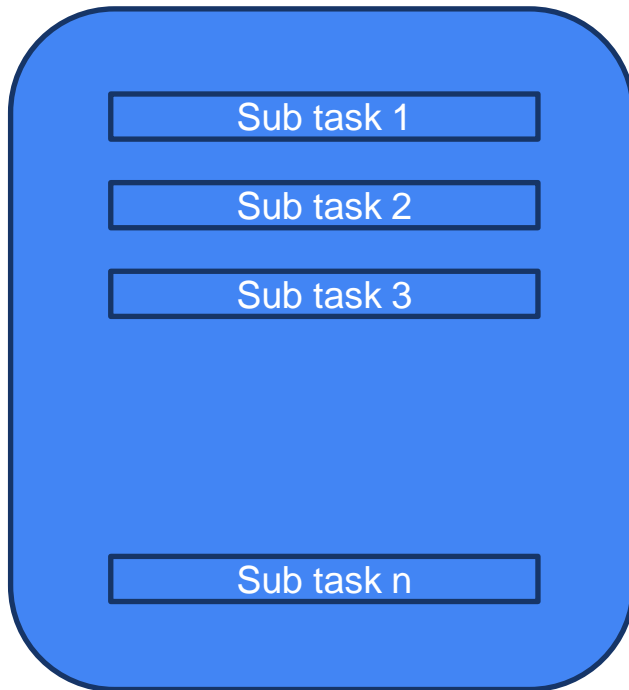


To check if a number is a prime number in JavaScript, you can use the following function:

```
function isPrime(num) {  
  if (num < 2) {  
    return false;  
  }  
  for (let i = 2; i < num; i++) {  
    if (num % i === 0) {  
      return false;  
    }  
  }  
  return true;  
}
```

# Why Agents?

- Not suitable for performing complex tasks



# AI Agents

# AI Agents

AI Agent is a software program that can interact with its environment, collect data, and use the data to perform self-determined tasks to meet predetermined goals

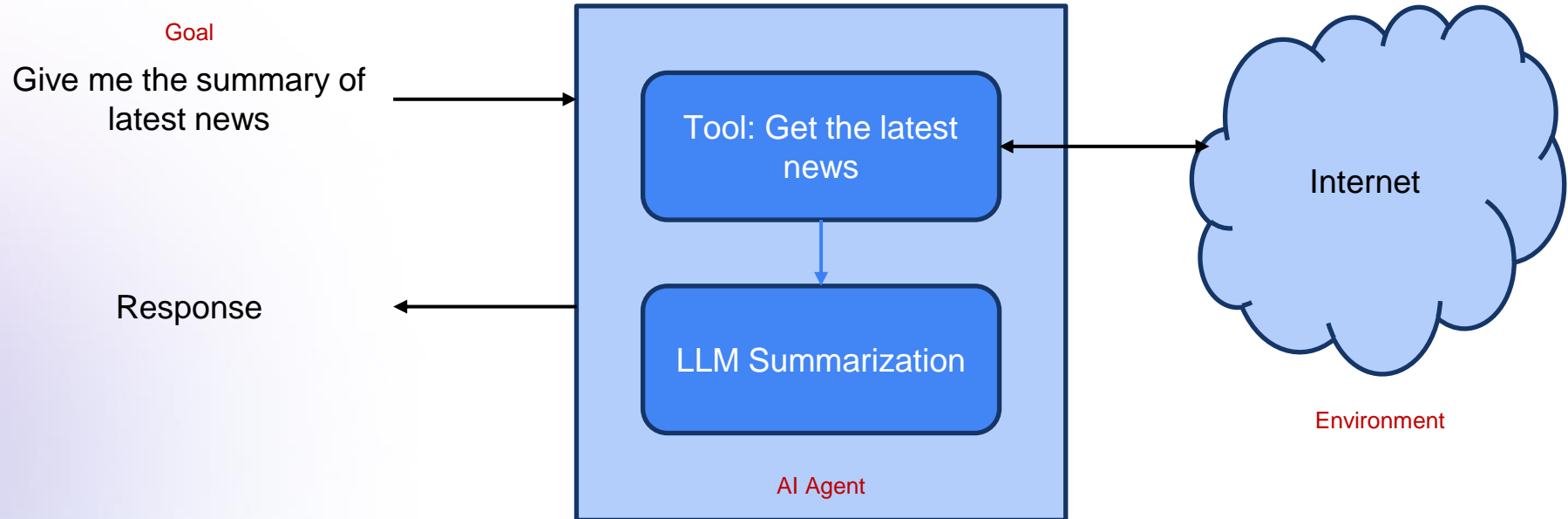
- AWS



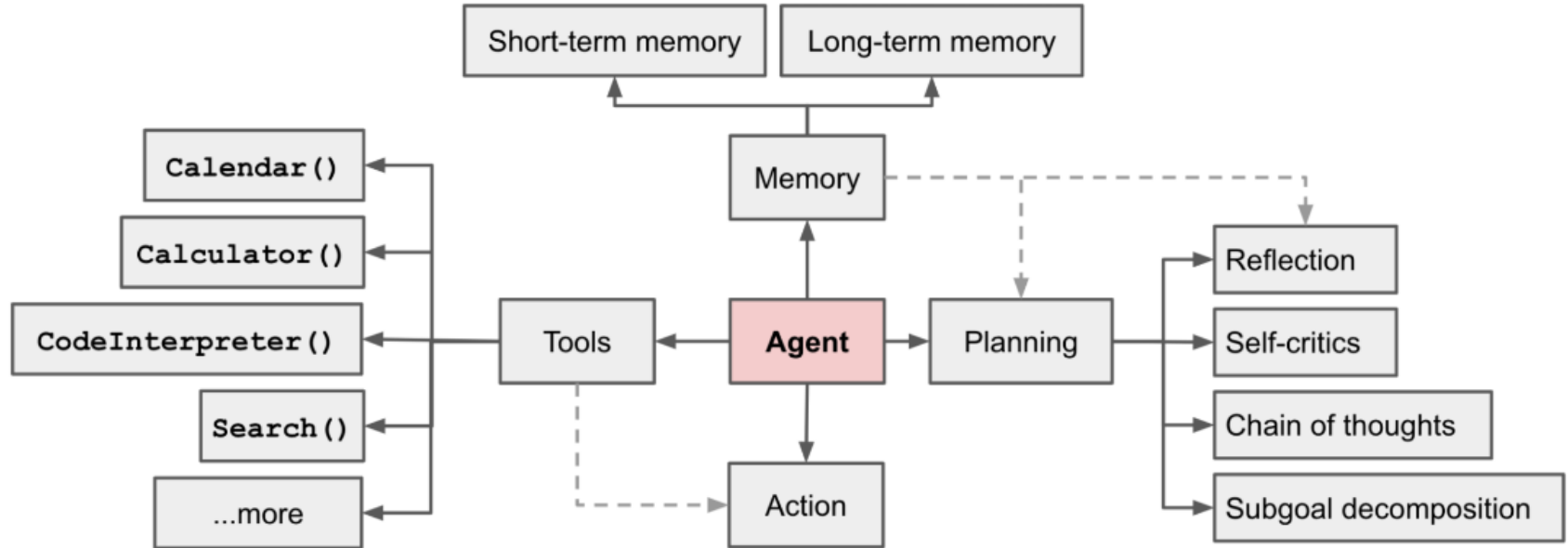
# AI Agents

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- AWS

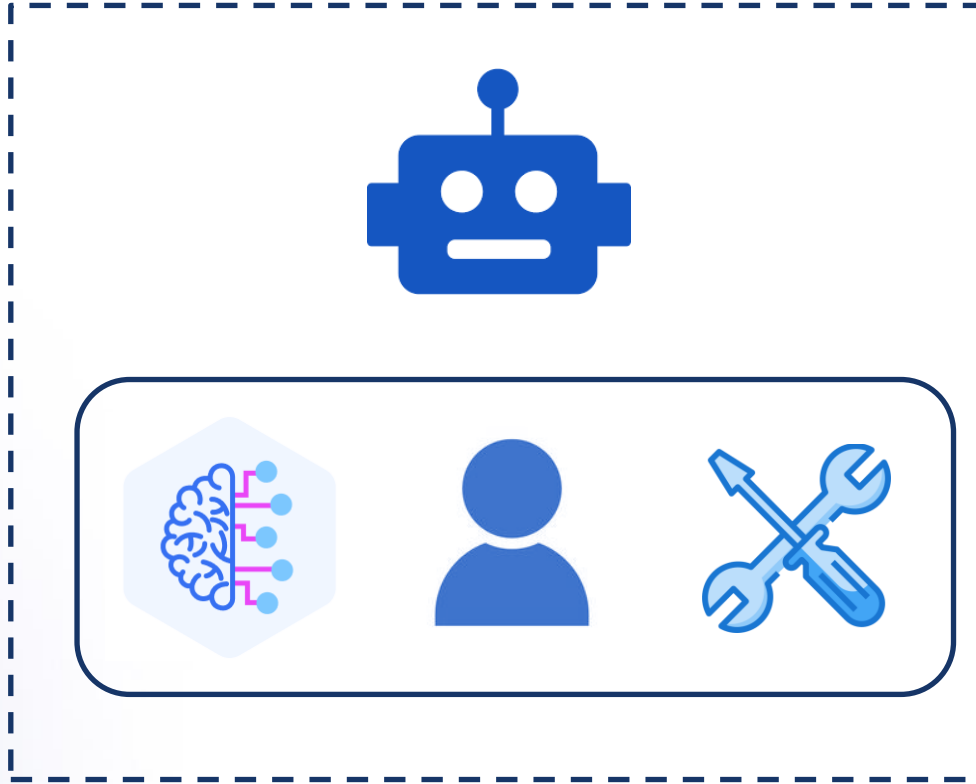


# AI Agents - Components

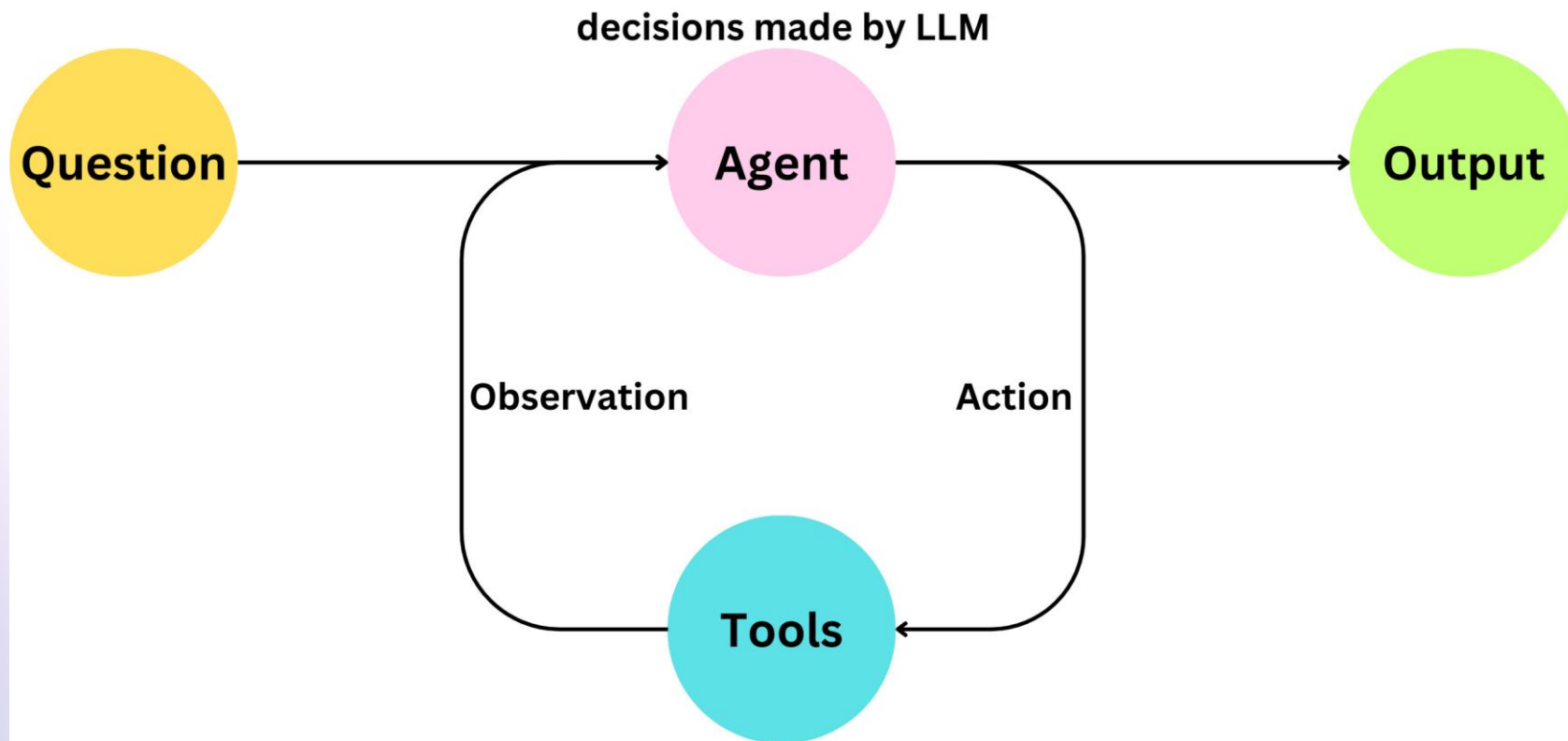


# Agent Systems

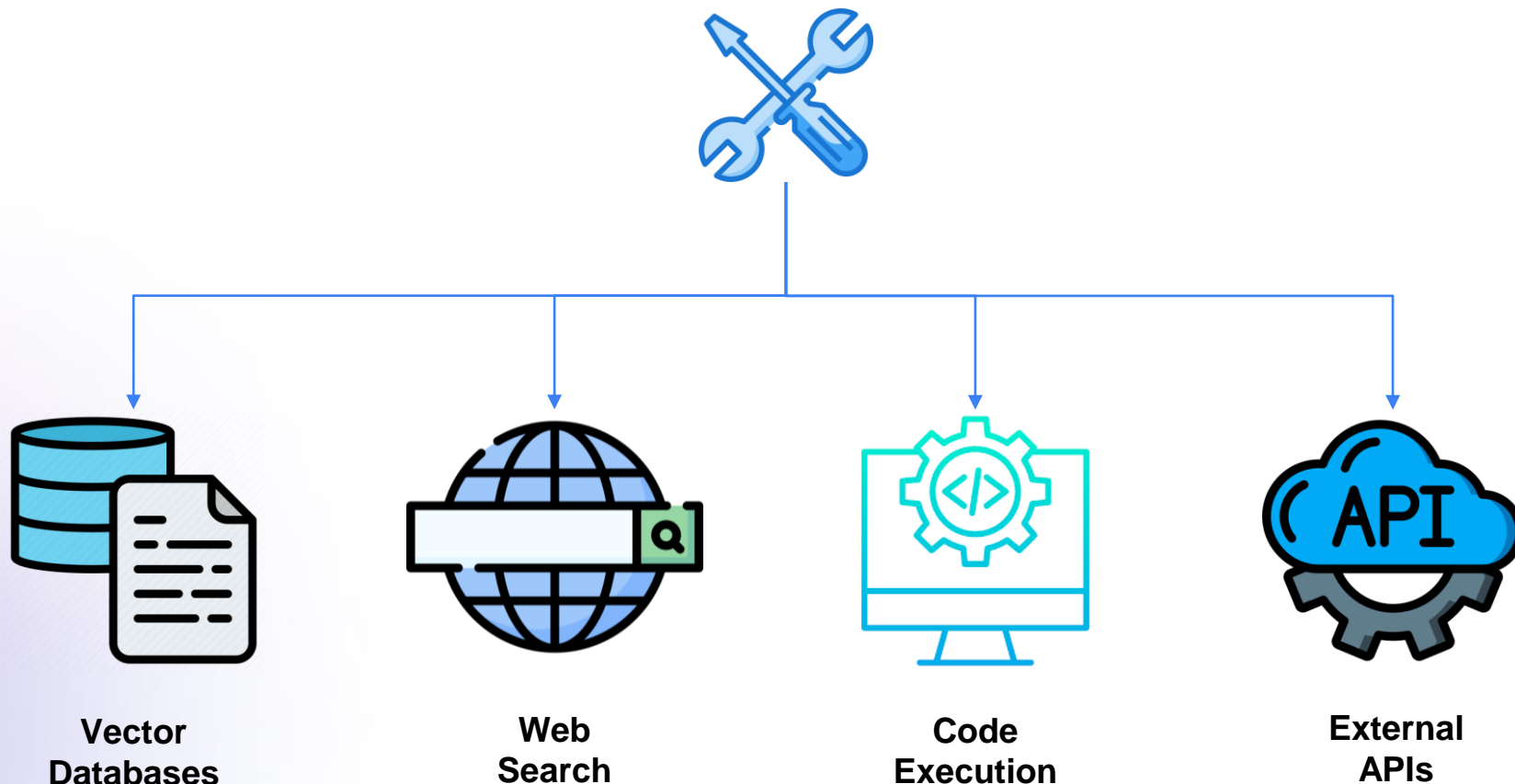
# Single Agent Systems



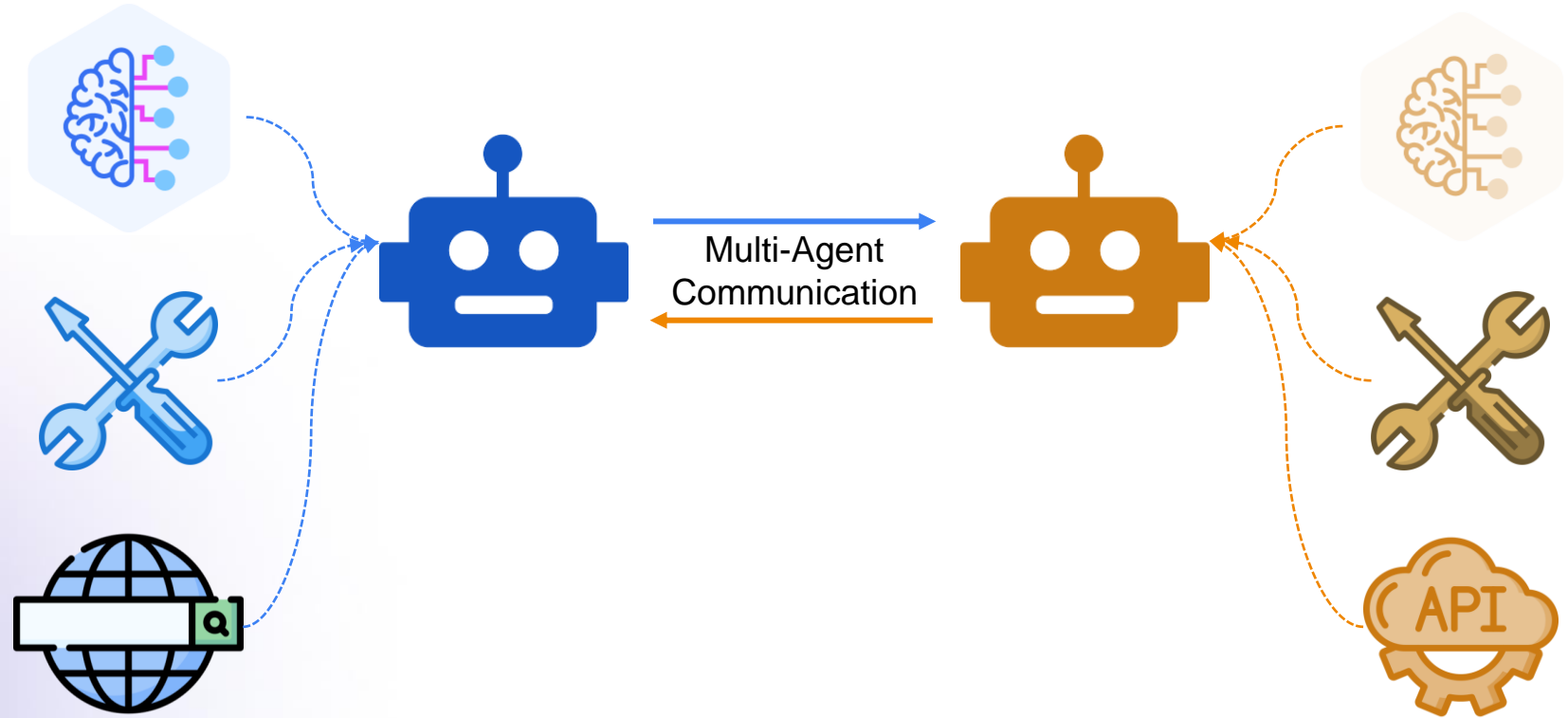
# Single Agent Systems – Tools Usage



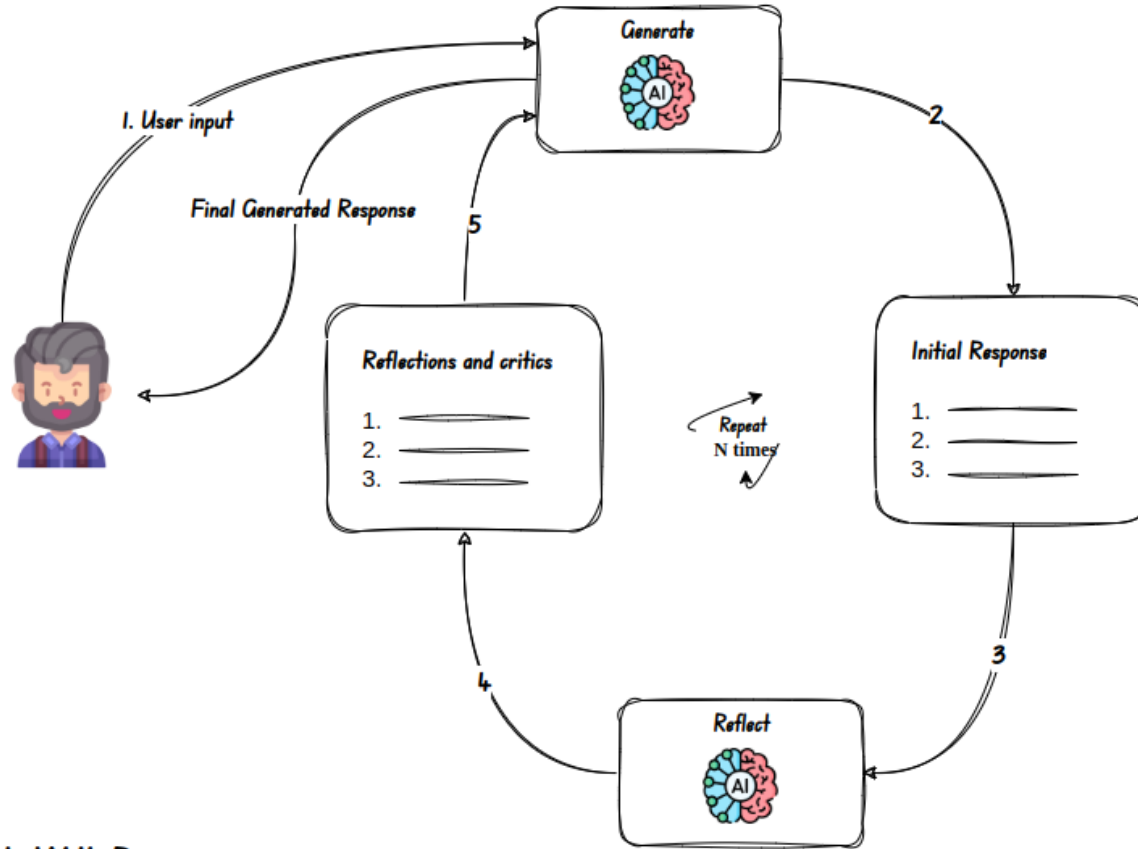
# Tools for Agents



# Multi Agent Systems



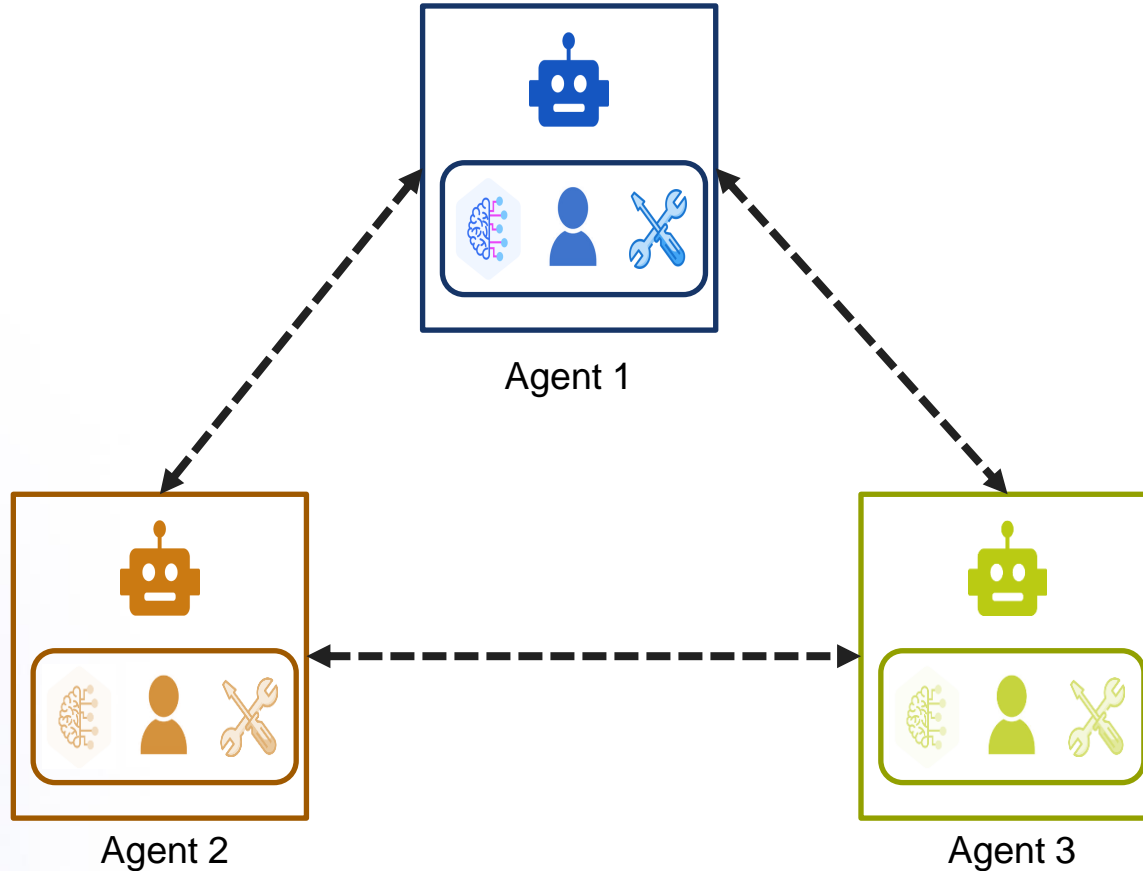
# Two Agent Systems - Reflection



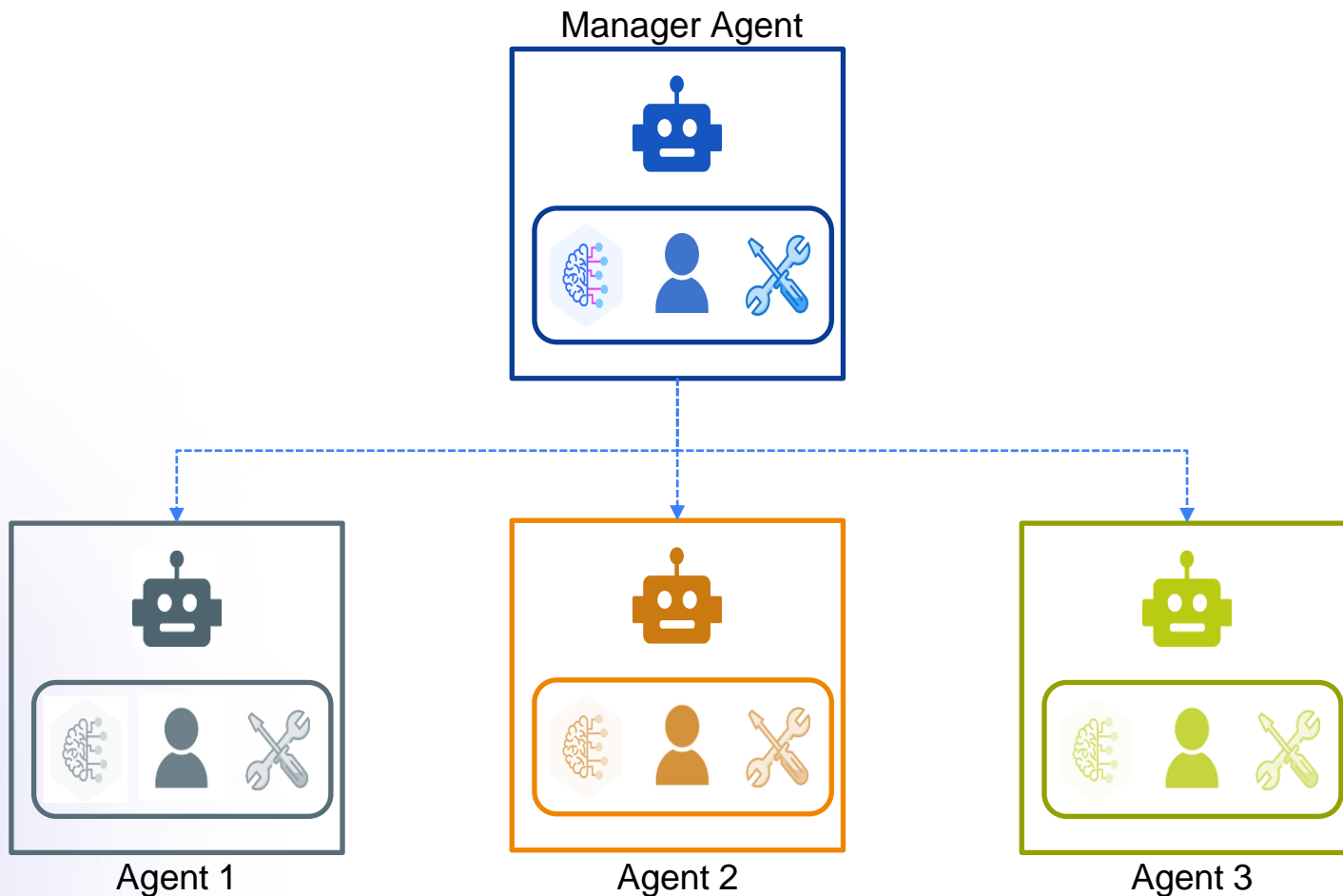
Code With Prince



# Multi Agent Systems – Group Chat



# Multi Agent Systems - Hierarchical



# Agentic Frameworks

# Agentic Frameworks

- Software platforms / packages that help create, manage and deploy AI agents
- Provides pre-built components, abstractions to build the systems
- Helps define the agentic workflows / design patterns
- Integrates with different tools and environments
- Enables communication between different agents
- Monitoring and debugging
- Planning and Memory management

# Agentic Frameworks



**AutoGen**



**llama-agent**



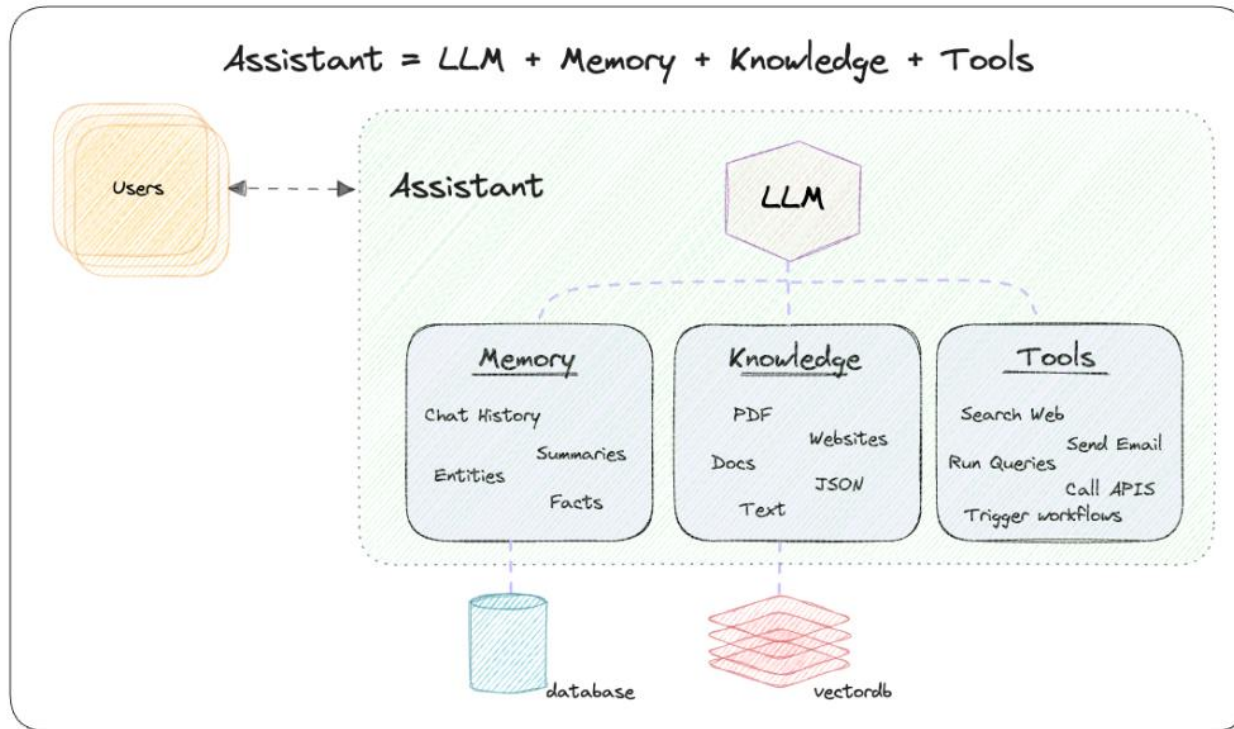
**phidata**



**LangGraph**

# Agentic Framework - PhiData

Build AI Assistants with memory, knowledge and tools



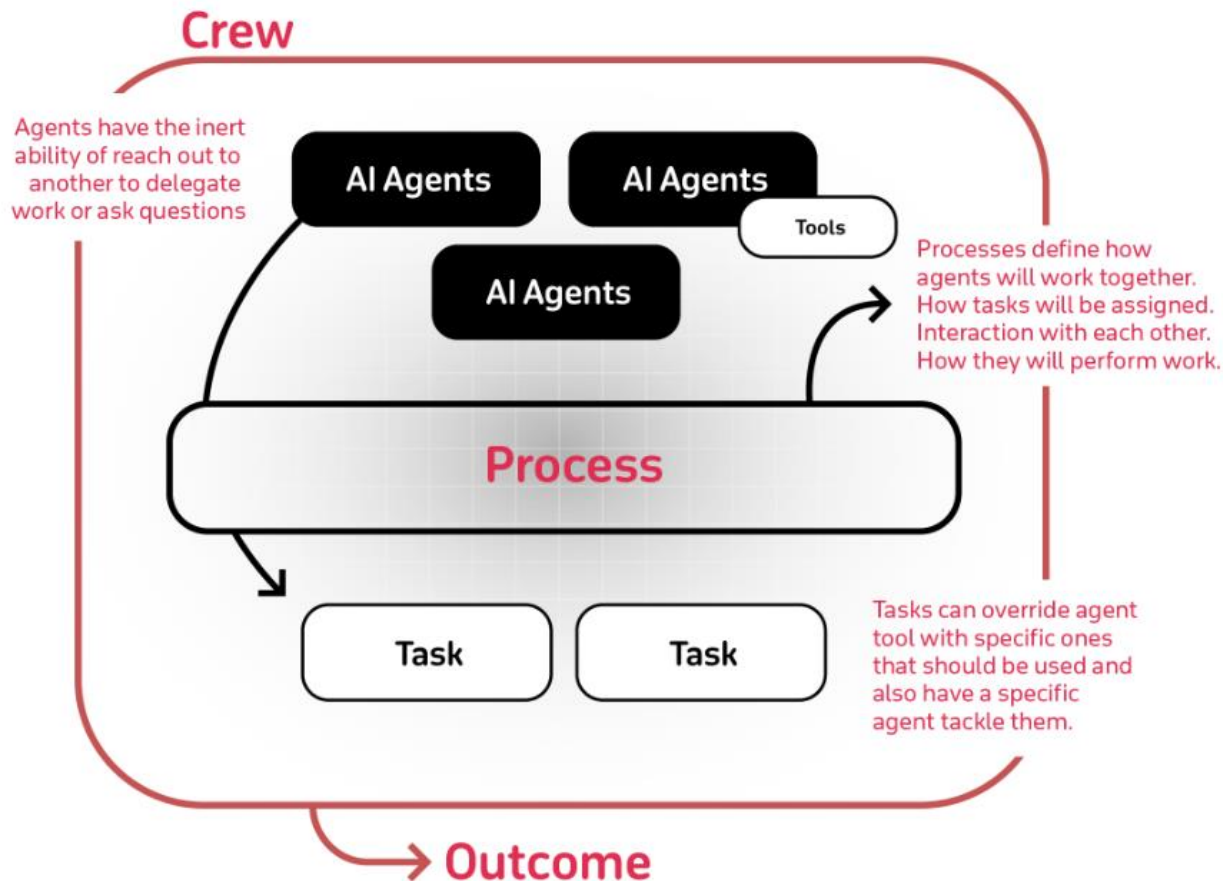
Demo

# Agentic Framework - CrewAI

- Designed to enable role playing AI agents, operating in a cohesive unit
- Able to define tasks with customizable tools and assign them to agents
- Task execution processes can be defined – sequential or hierarchical
- Output can be saved as a file
- Works with open-source models



# Agentic Framework - CrewAI

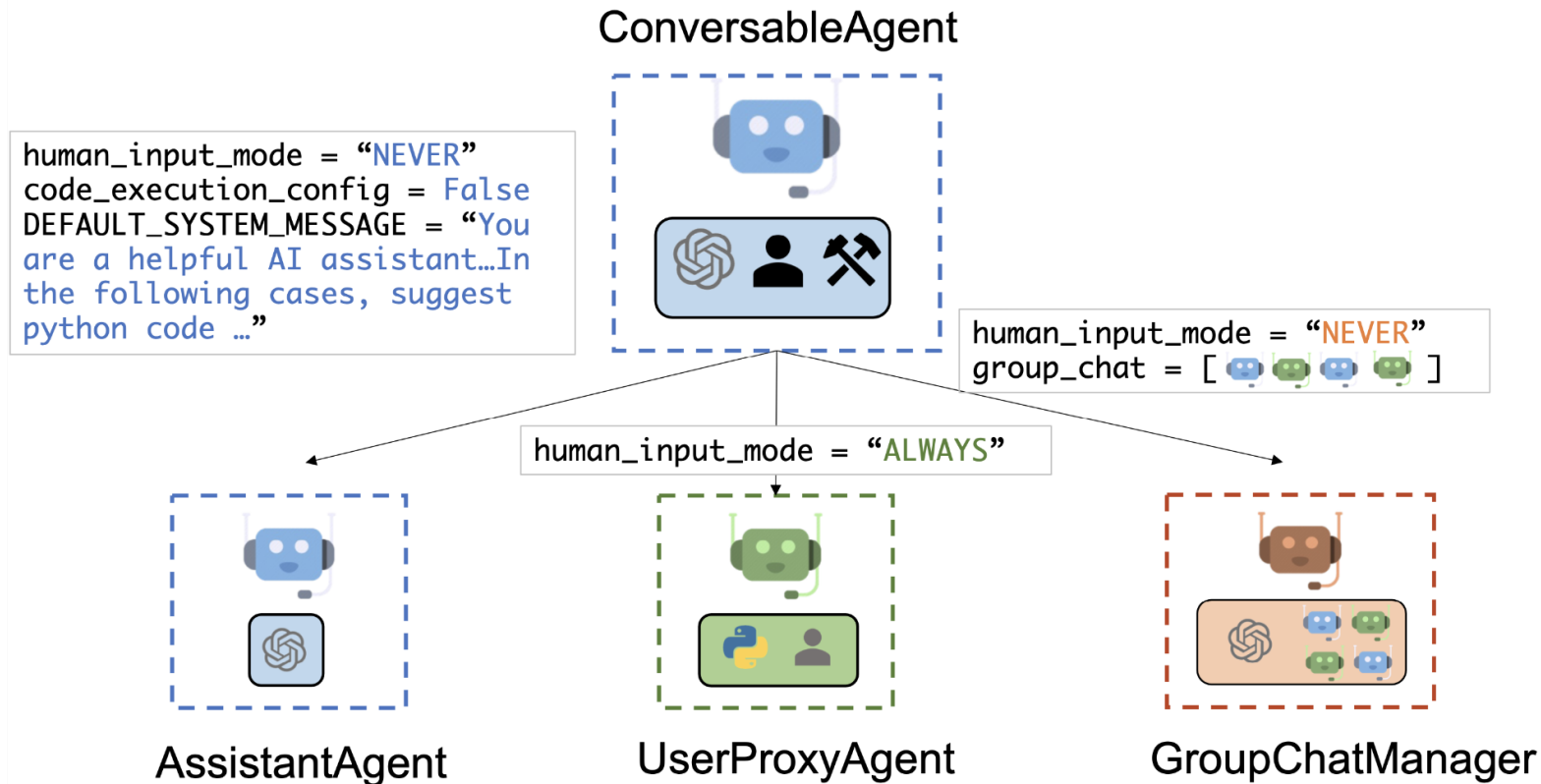


Demo

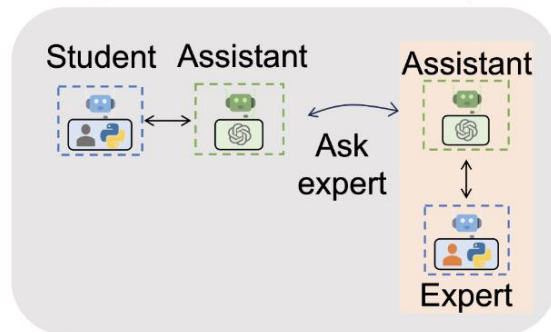
# Agentic Framework - AutoGen

- Open-source programming framework by Microsoft for building AI Agents
- AI Agents can be customized for different needs
- Supports diverse conversation patterns for complex multi-agent workflows
- Support for human-in-the-loop interactions
- Support for code execution via local environment and docker
- Support for multi-modality
- Conversational memory and context management support
- Built-in error handling
- In-depth examples and documentation

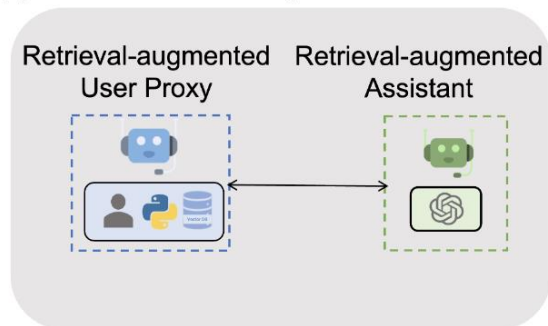
# Agentic Framework - AutoGen



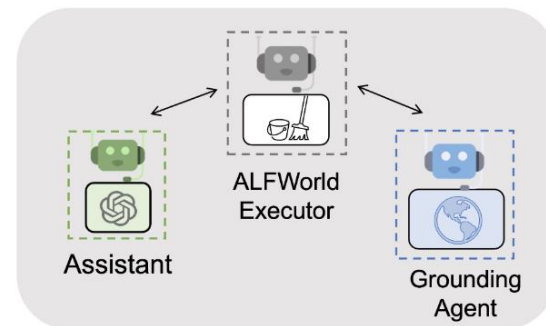
# Agentic Framework - AutoGen



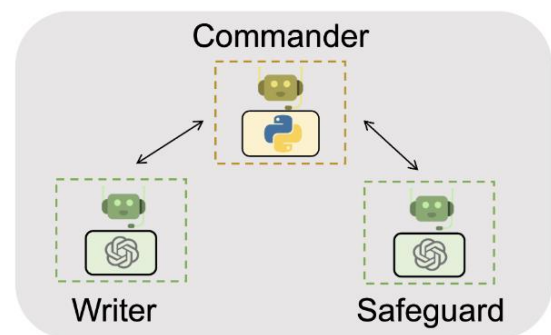
A1. Math Problem Solving



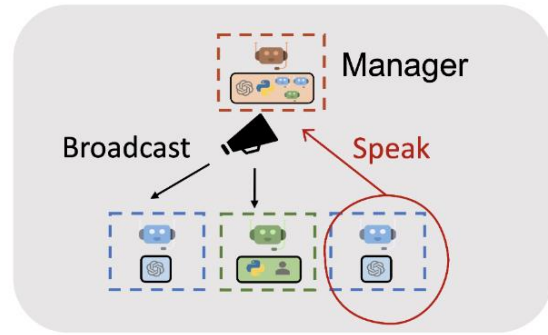
A2. Retrieval-augmented Chat



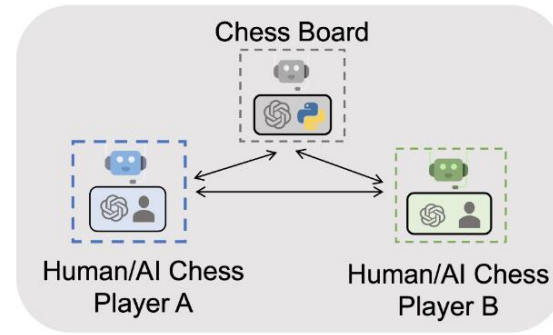
A3. Decision Making



A4. Multi-agent Coding



A5. Dynamic Group Chat



A6. Conversational Chess

# Agentic Framework - AutoGen

Demo

# Conclusion

- Agentic frameworks are evolving rapidly
- Choose the one that is best suited for the use case
- Start with simple flows before moving on to complex ones
- Define and constrain the flow wherever possible
- Logging and tracing help debug the individual components

# References

- Lilian Weng blog - <https://lilianweng.github.io/posts/2023-06-23-agent/>
- Analytics Vidhya - <https://www.analyticsvidhya.com/blog/2024/07/ai-agent-frameworks/>
- Prompting Guide - <https://www.promptingguide.ai/research/llm-agents>
- AutoGen Docs - <https://microsoft.github.io/autogen/docs/Getting-Started/>
- CrewAI Docs - <https://docs.crewai.com/>
- Deeplearning ai courses - <https://www.deeplearning.ai/short-courses/multi-ai-agent-systems-with-crewai>



# Thank You

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