



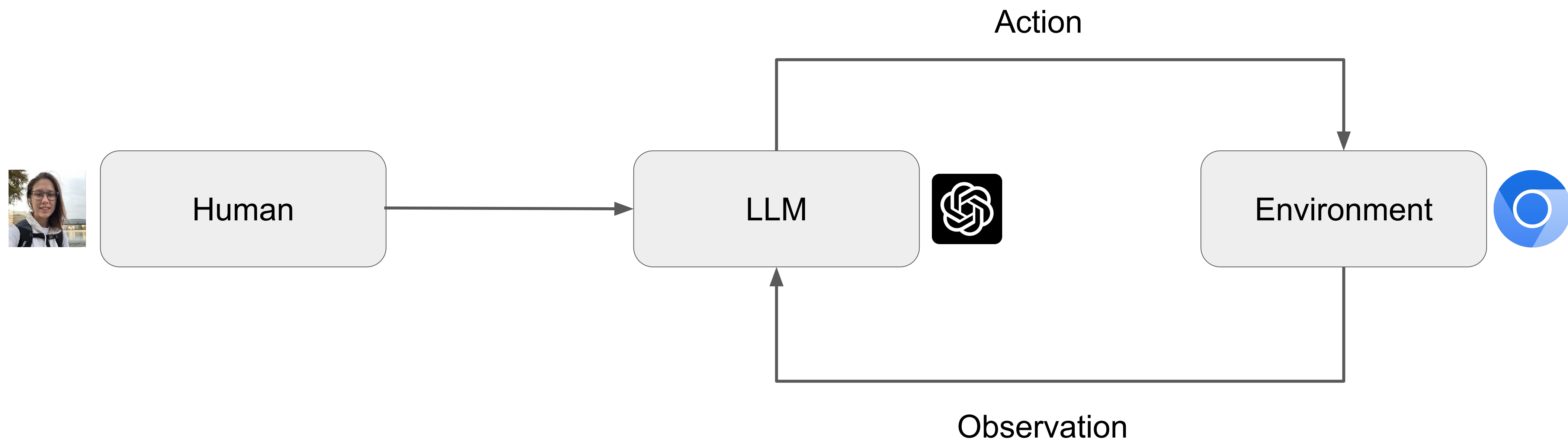
# Koog

by Maria Tigina, Developer @ Koog Team, JetBrains  
& Anastasiia Zarechneva, QA @ Koog Team, JetBrains

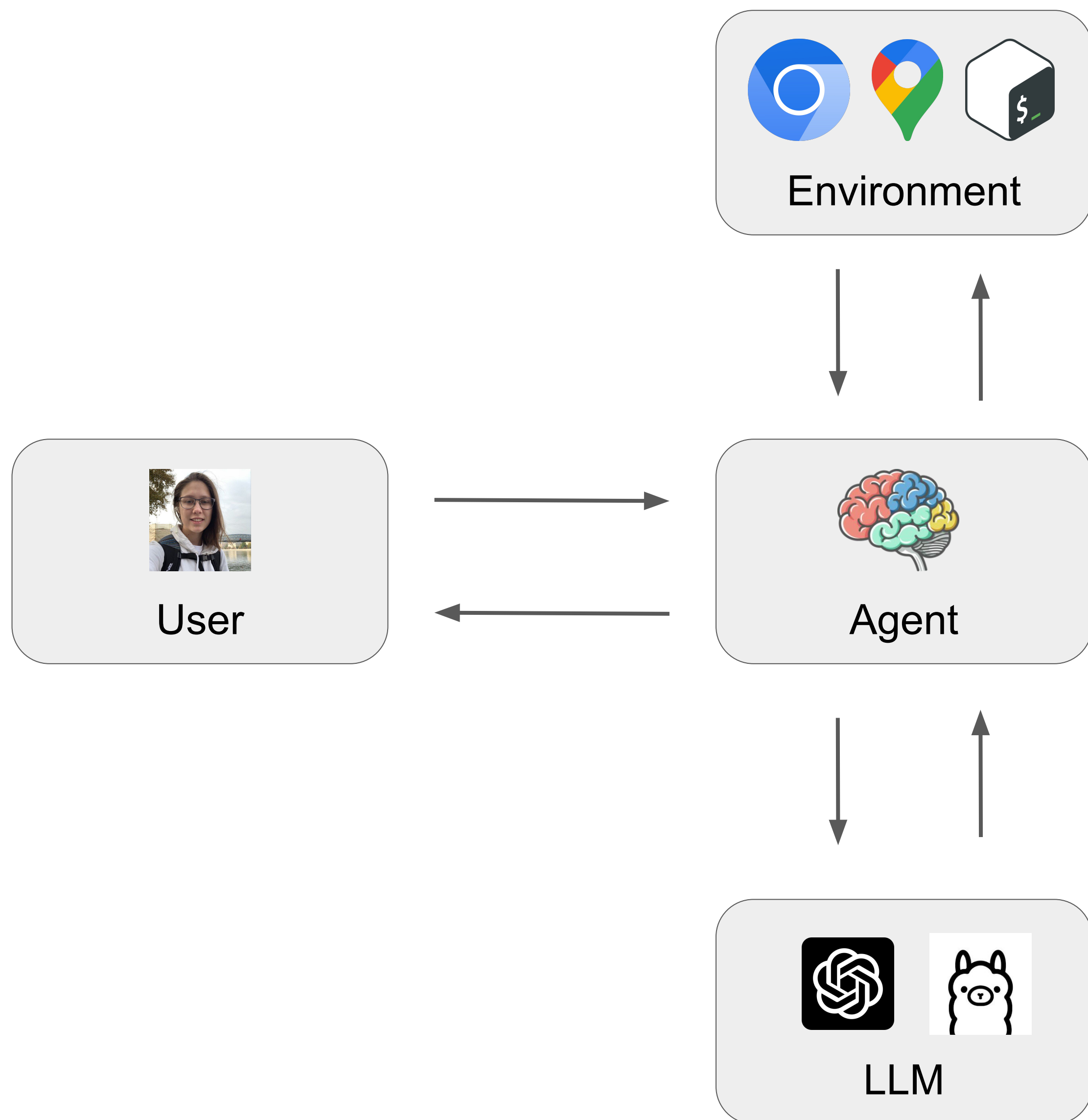
# Plan for today

1. Koog Agent structure
2. Prompt and PromptExecutor
3. Tools and ToolRegistry
4. Strategy
5. Assignment
6. Timeline

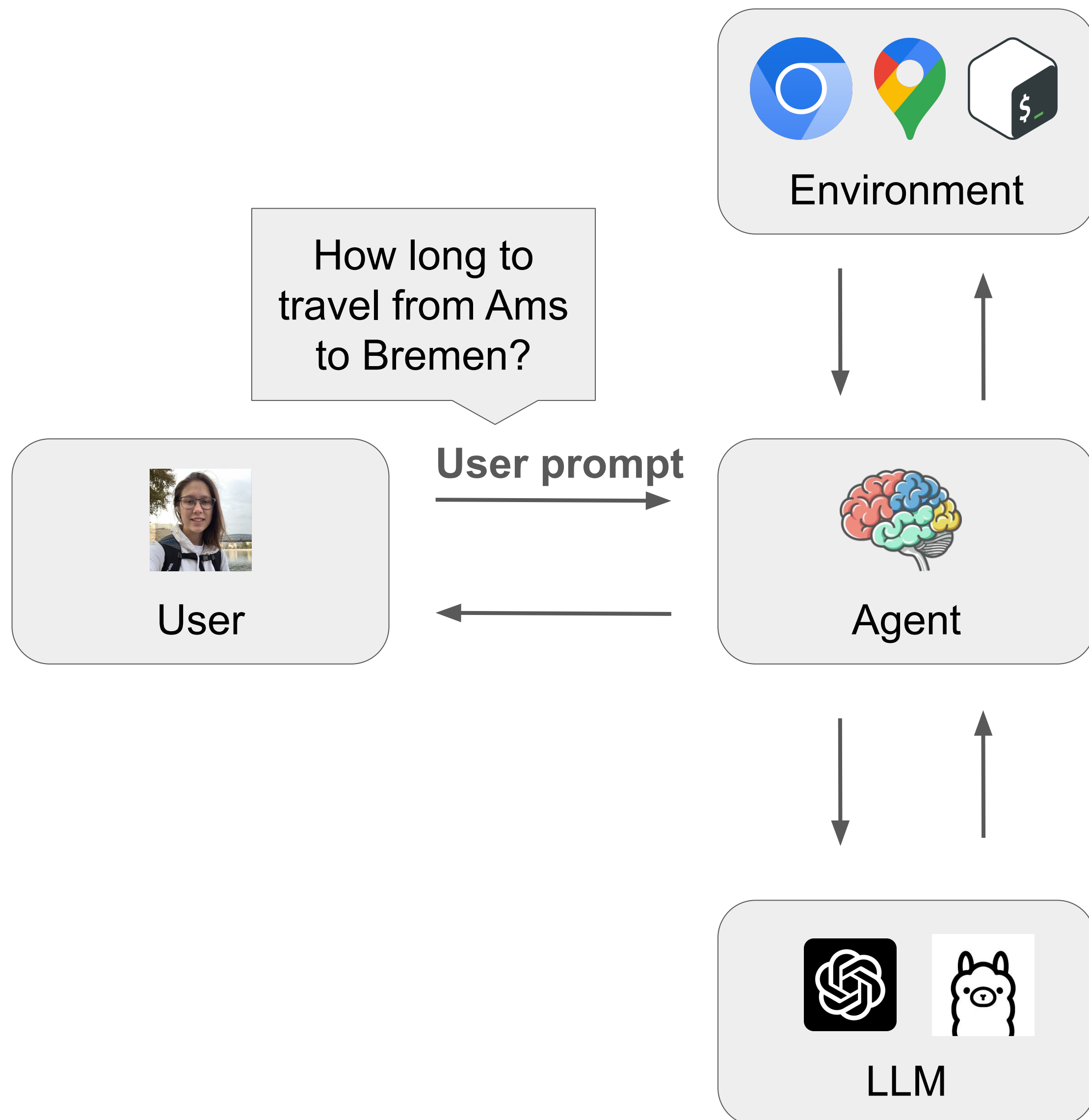
# What is an Agent?



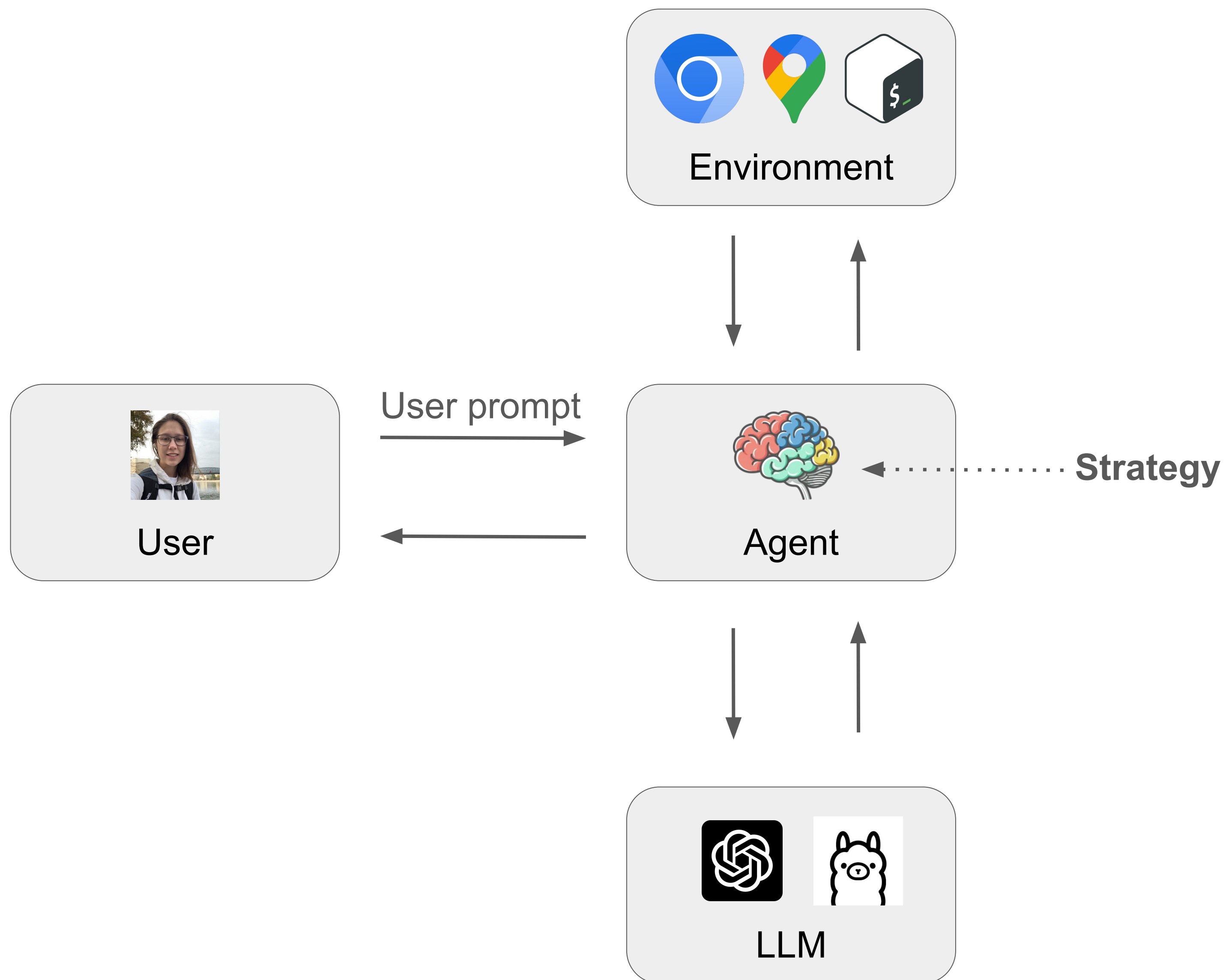
# What is an Agent in **Koog**?



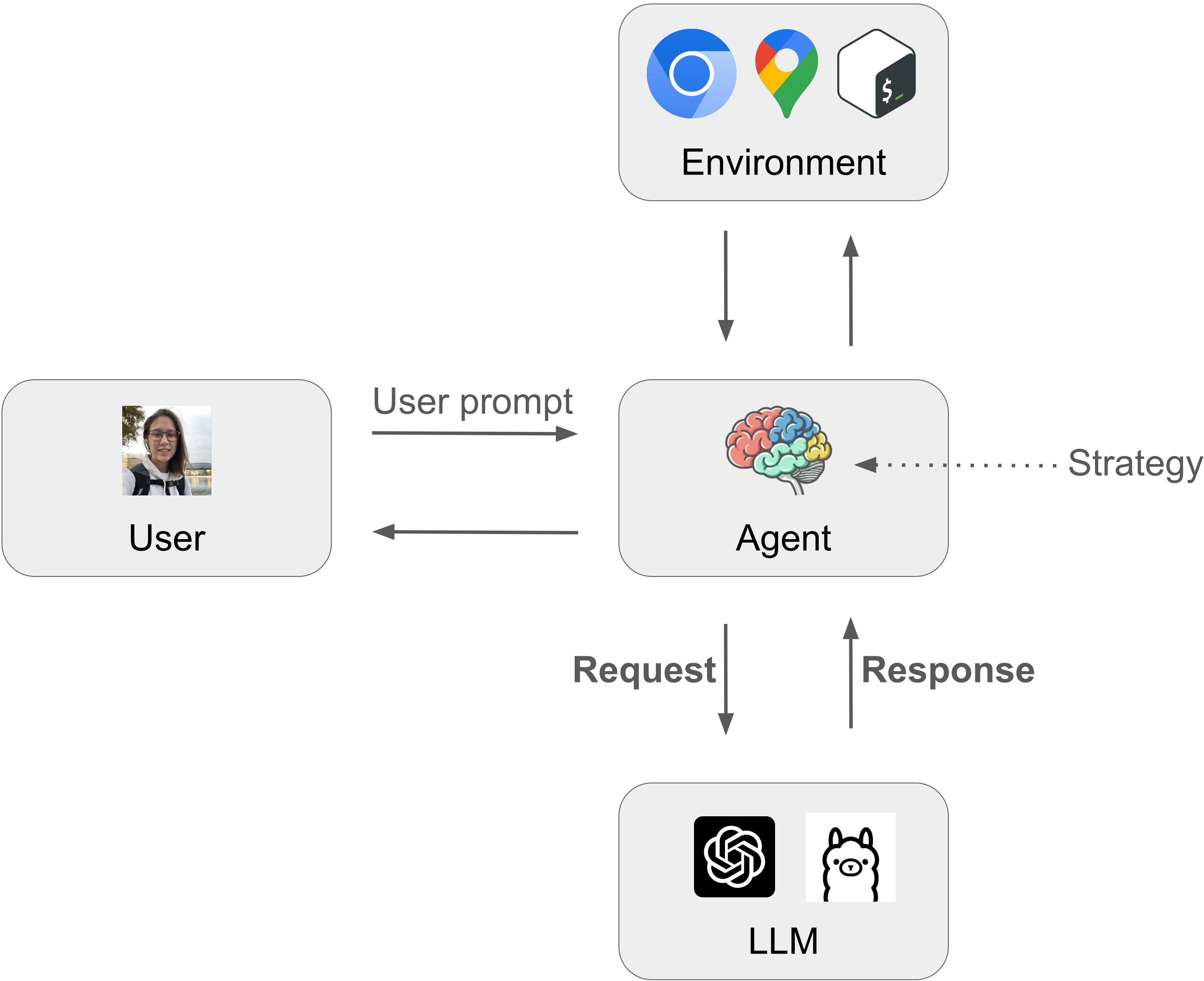
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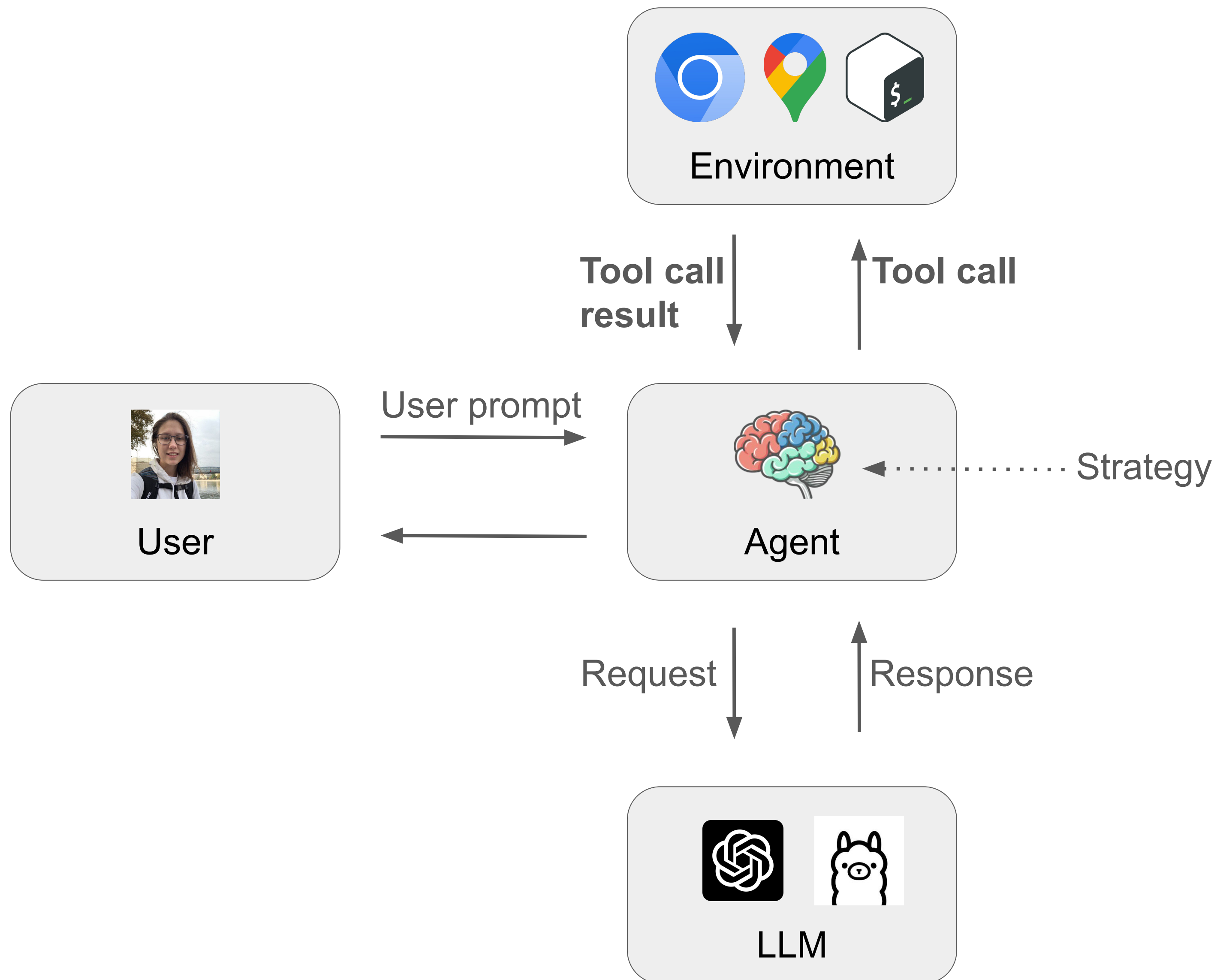
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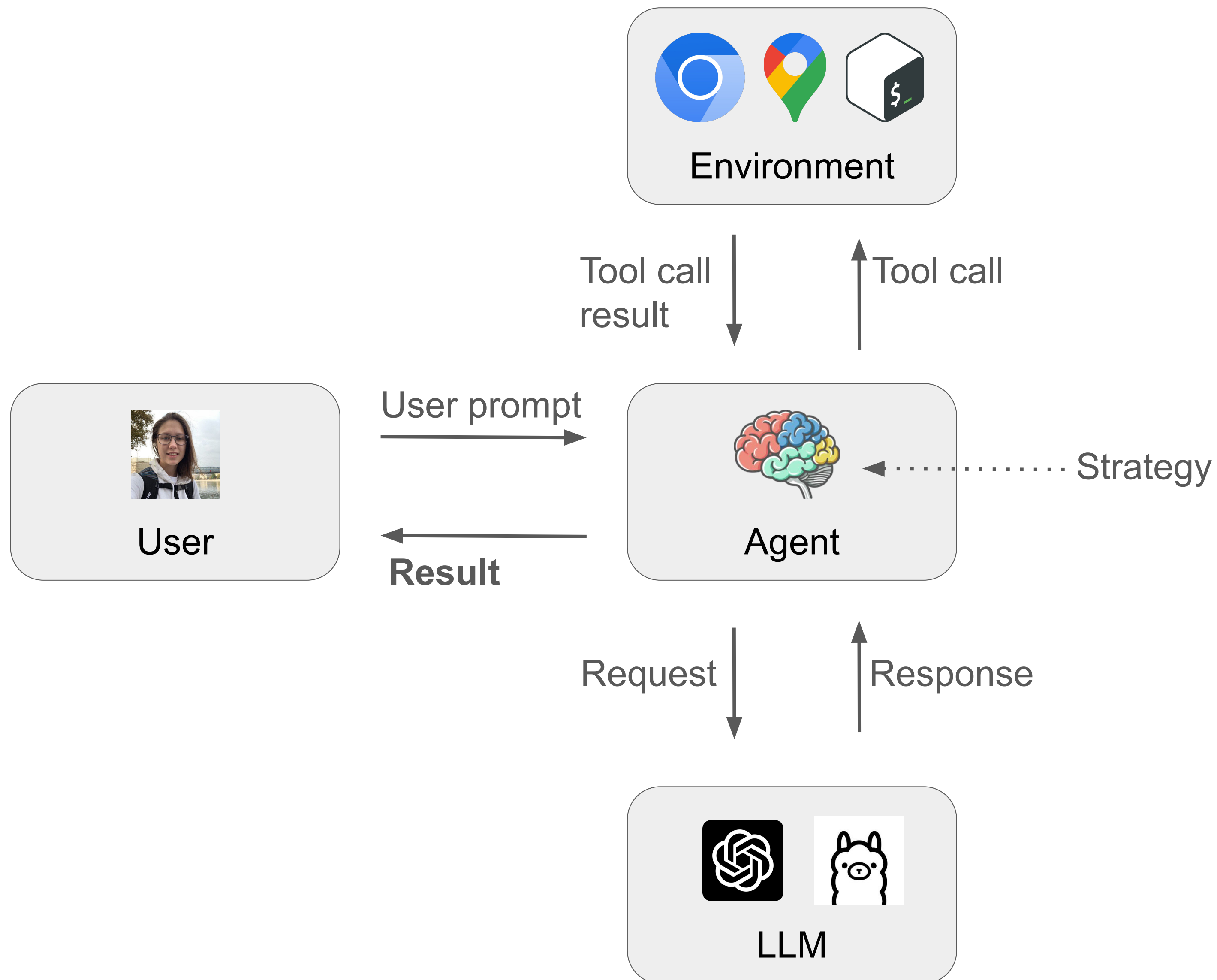
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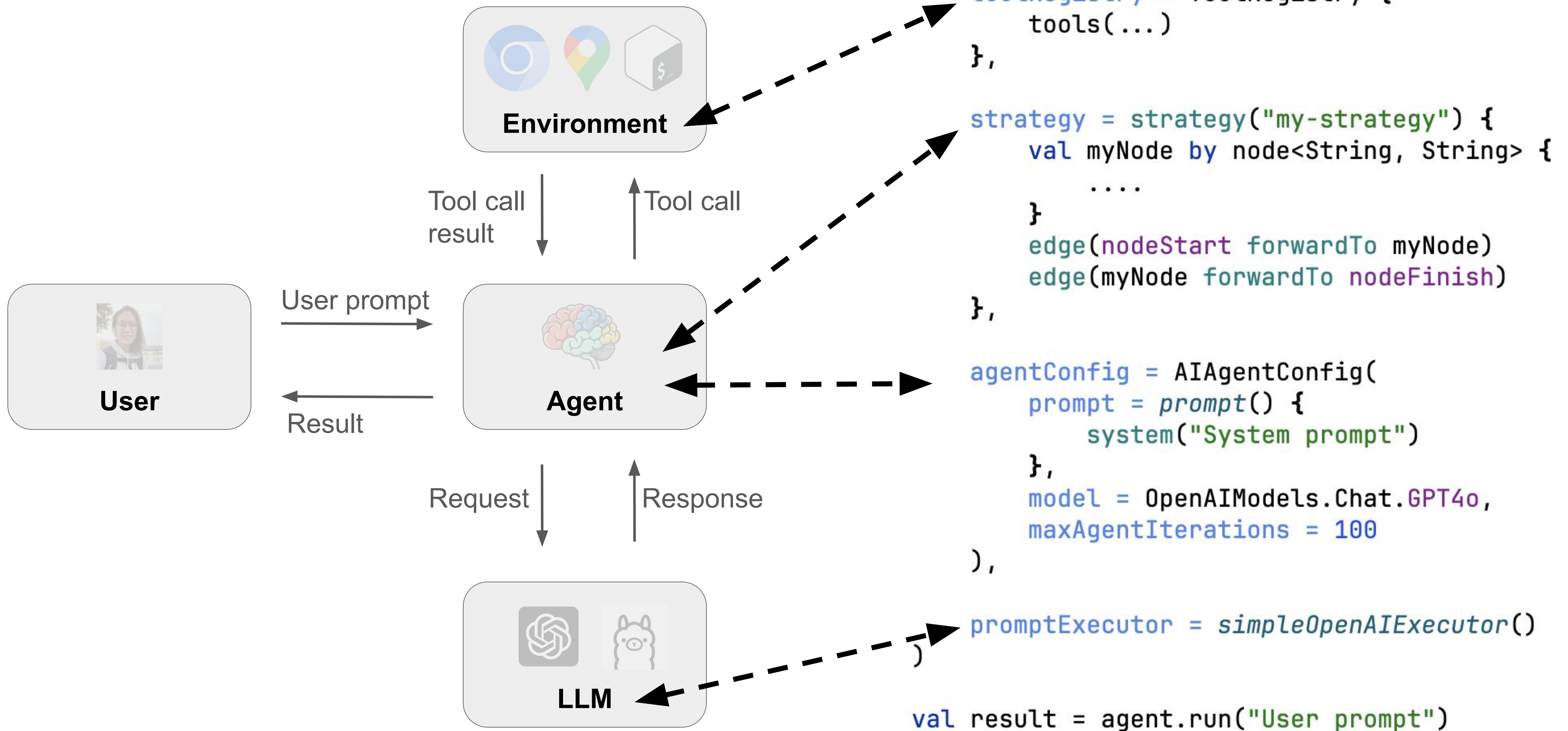
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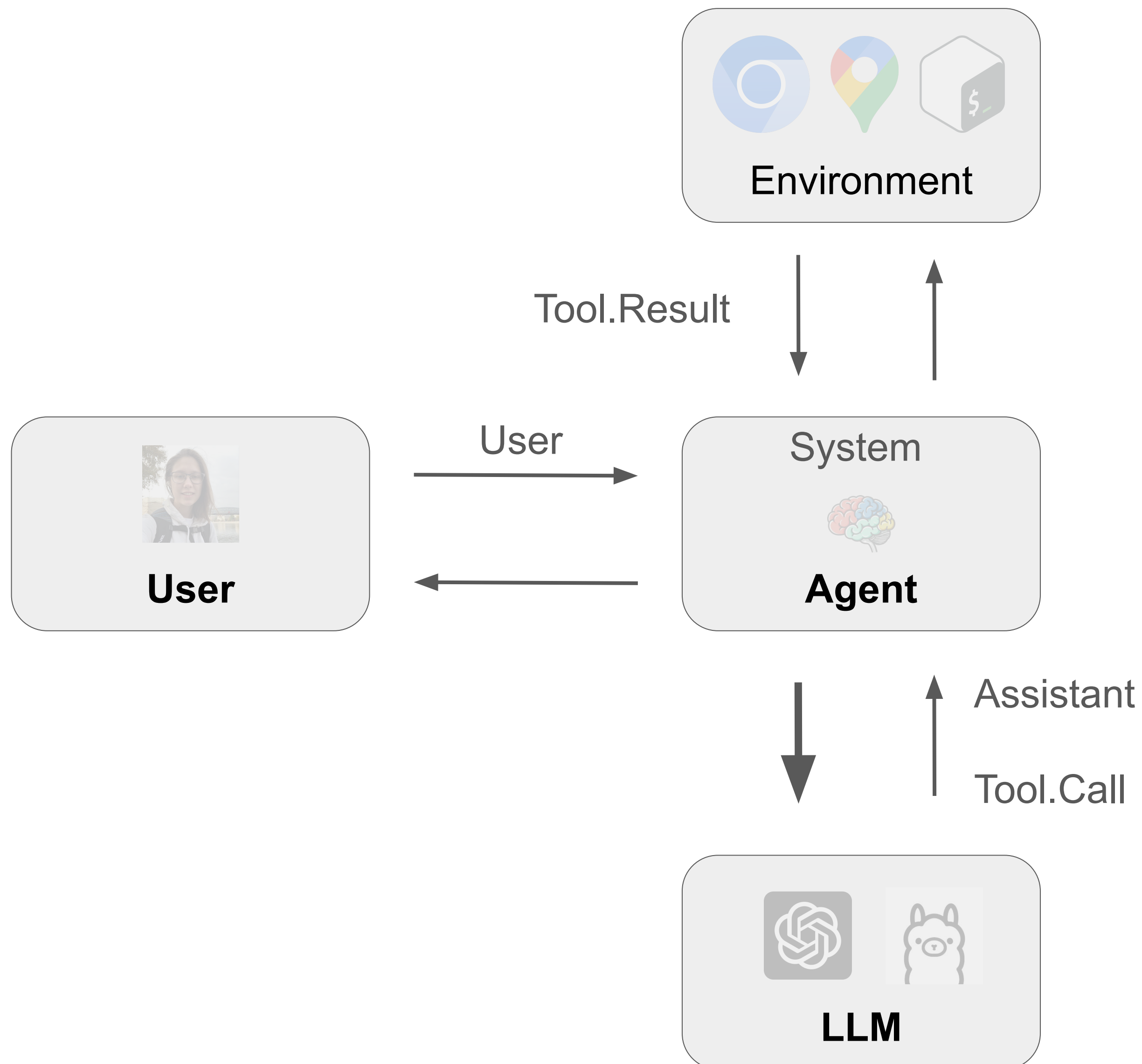


# What is an Agent in Koog?



git clone <https://github.com/tiginamaria/koog-workshop>  
git checkout task

# Prompt



## Message types:

- System – general instructions for agent
- User – user request or additional feedback
- Assistant – text LLM response
- Tool.Call – tool LLM response
- Tool.Result – tool execution result (should follow Tool.Call)

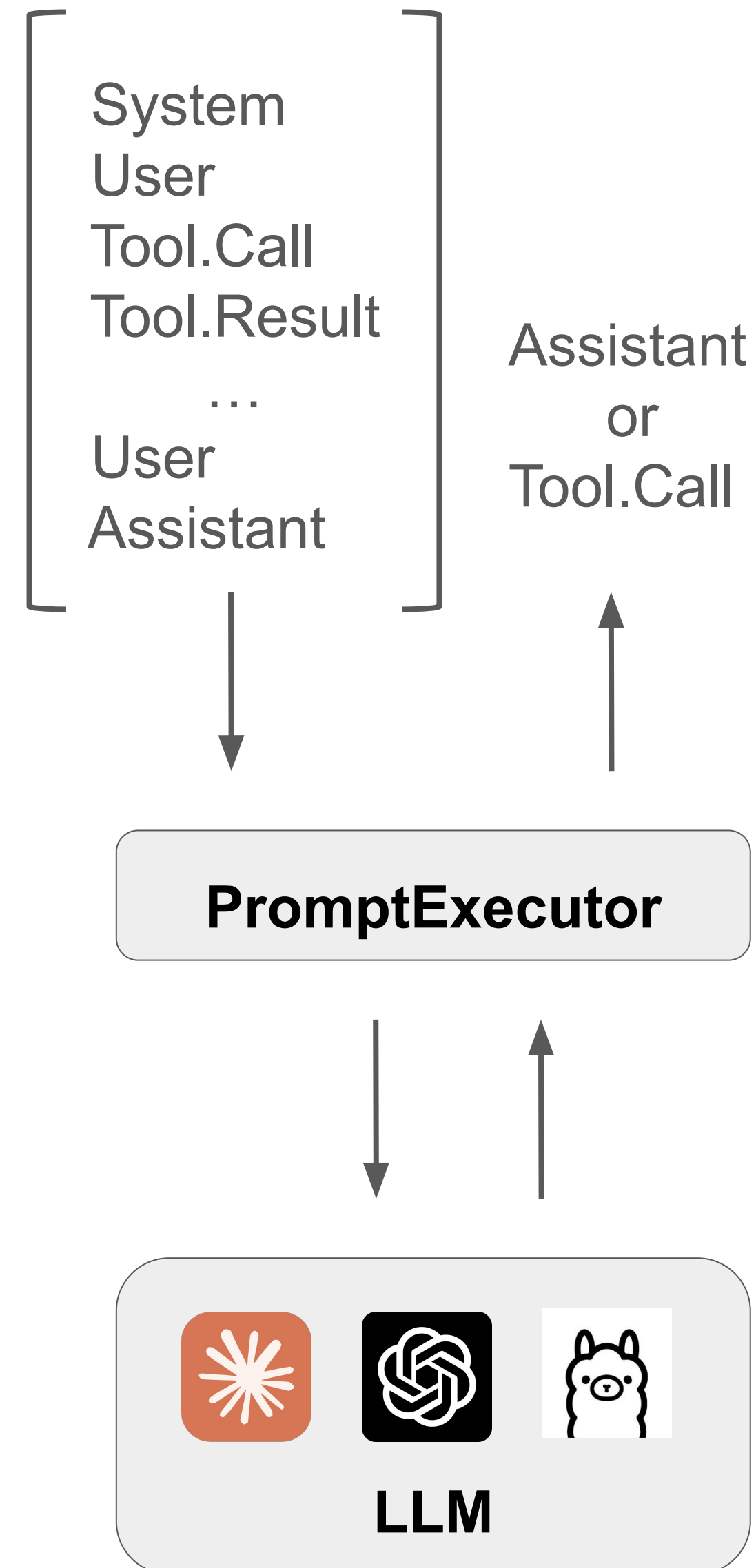
## Good to know:

- The whole message history goes to the LLM as context
- You can attach files/images to the user messages



01-PromptTask.kt

# PromptExecutor

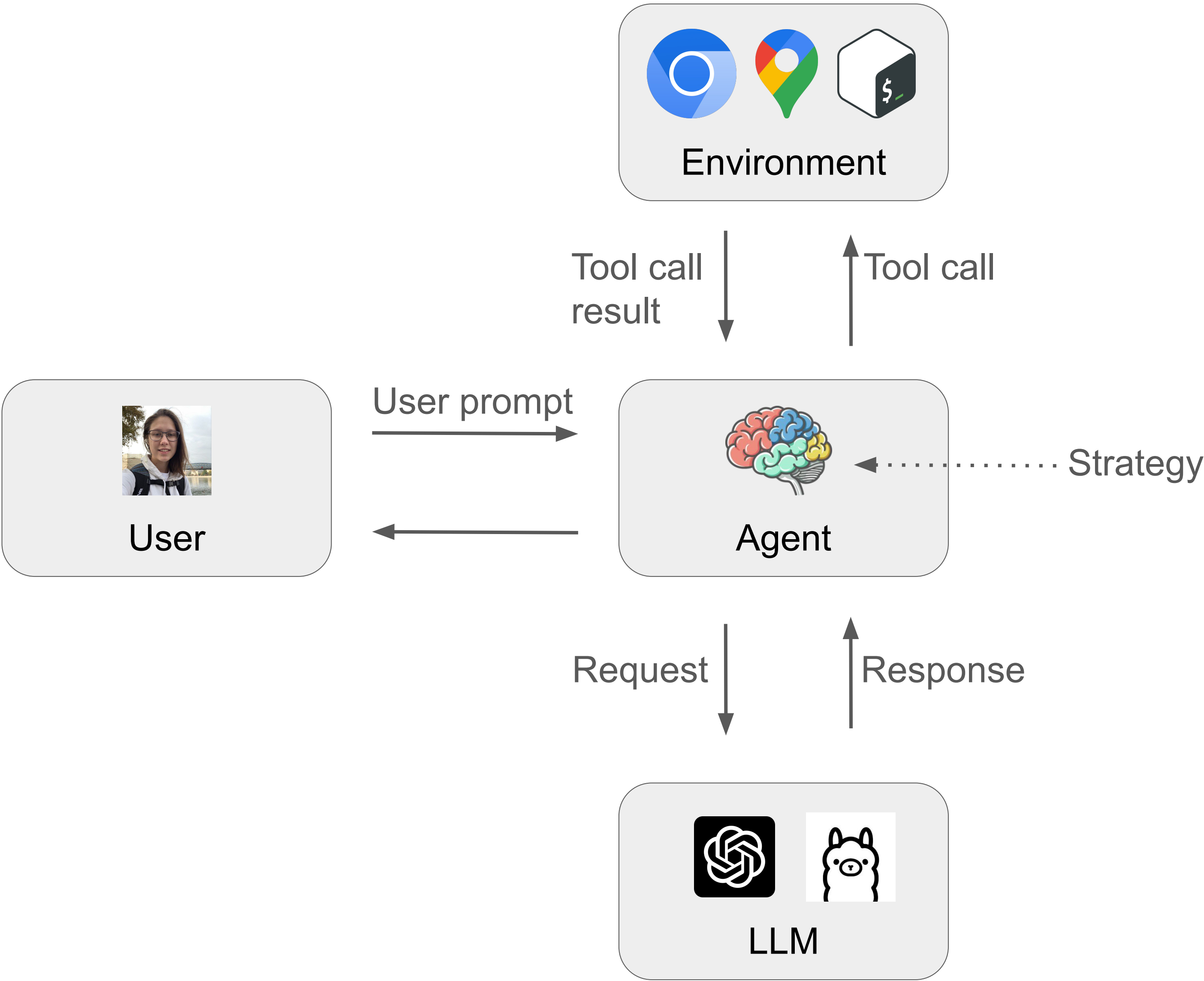


- Sends the list of messages to the LLM, return message (or list of messages) generated by the LLM
- Wraps the LLM clients (providers)
- For every client the messages content and format can differ, executor is made to unify them

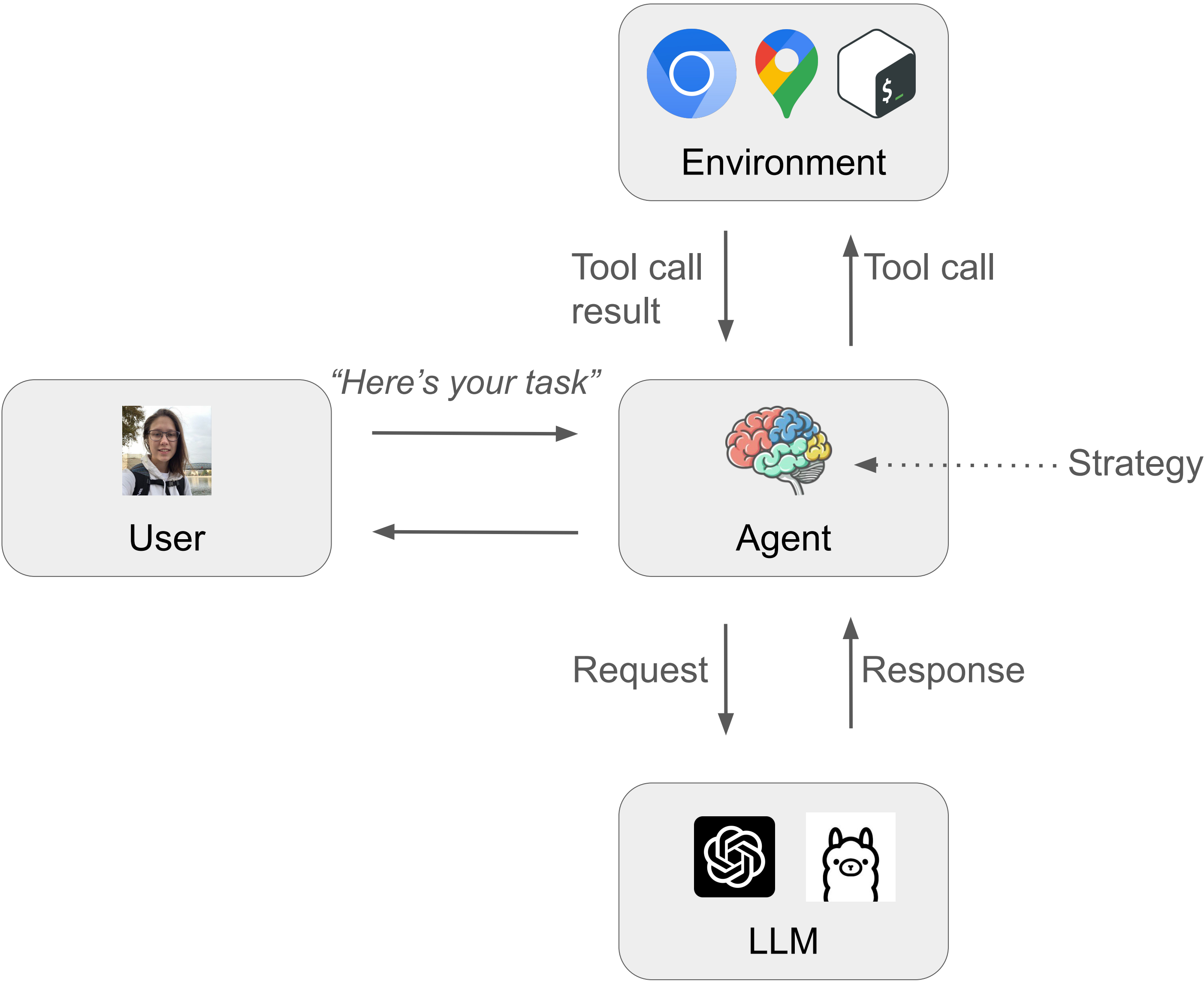


## 02-PromptExecutorTask.kt

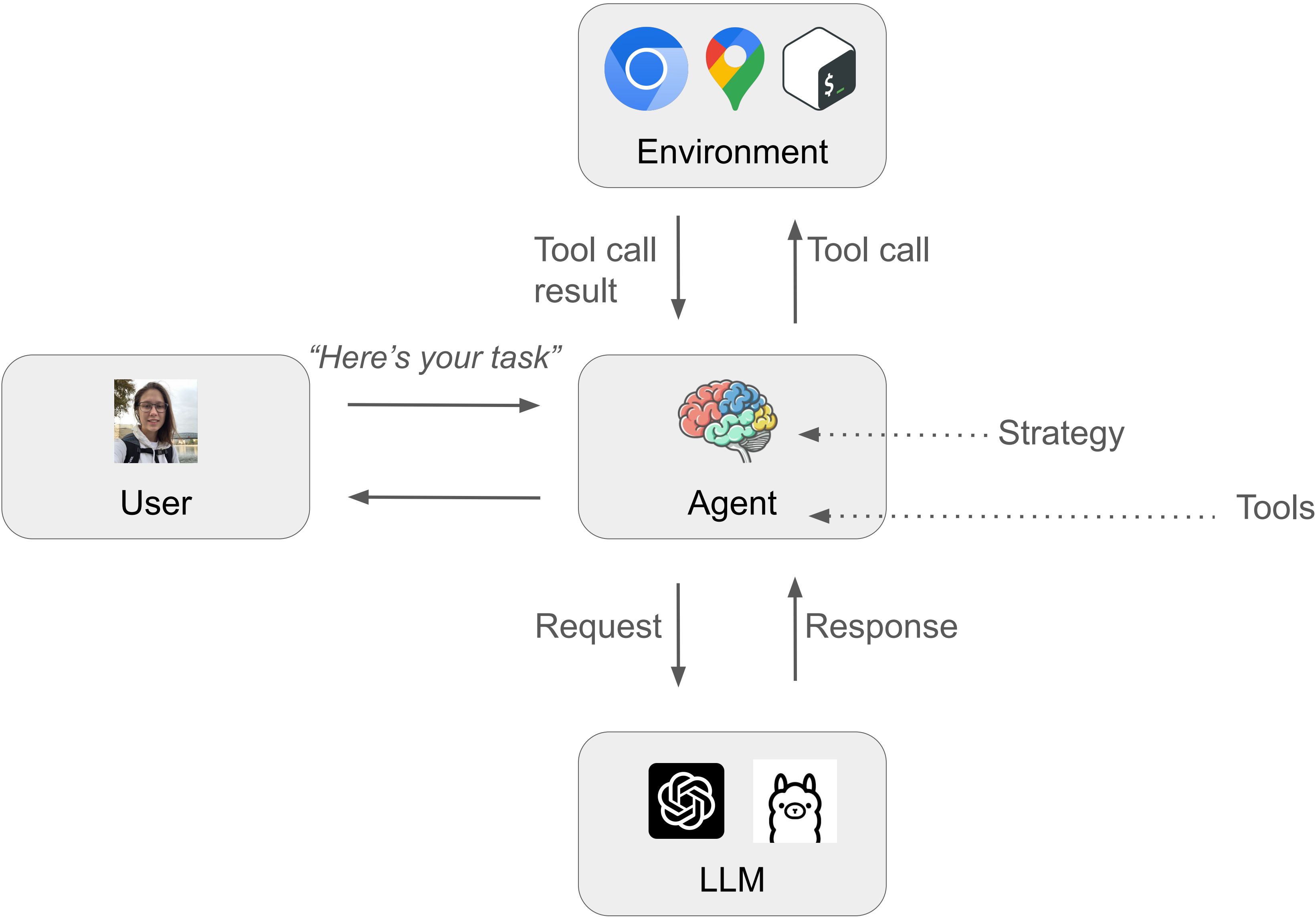
# Tools



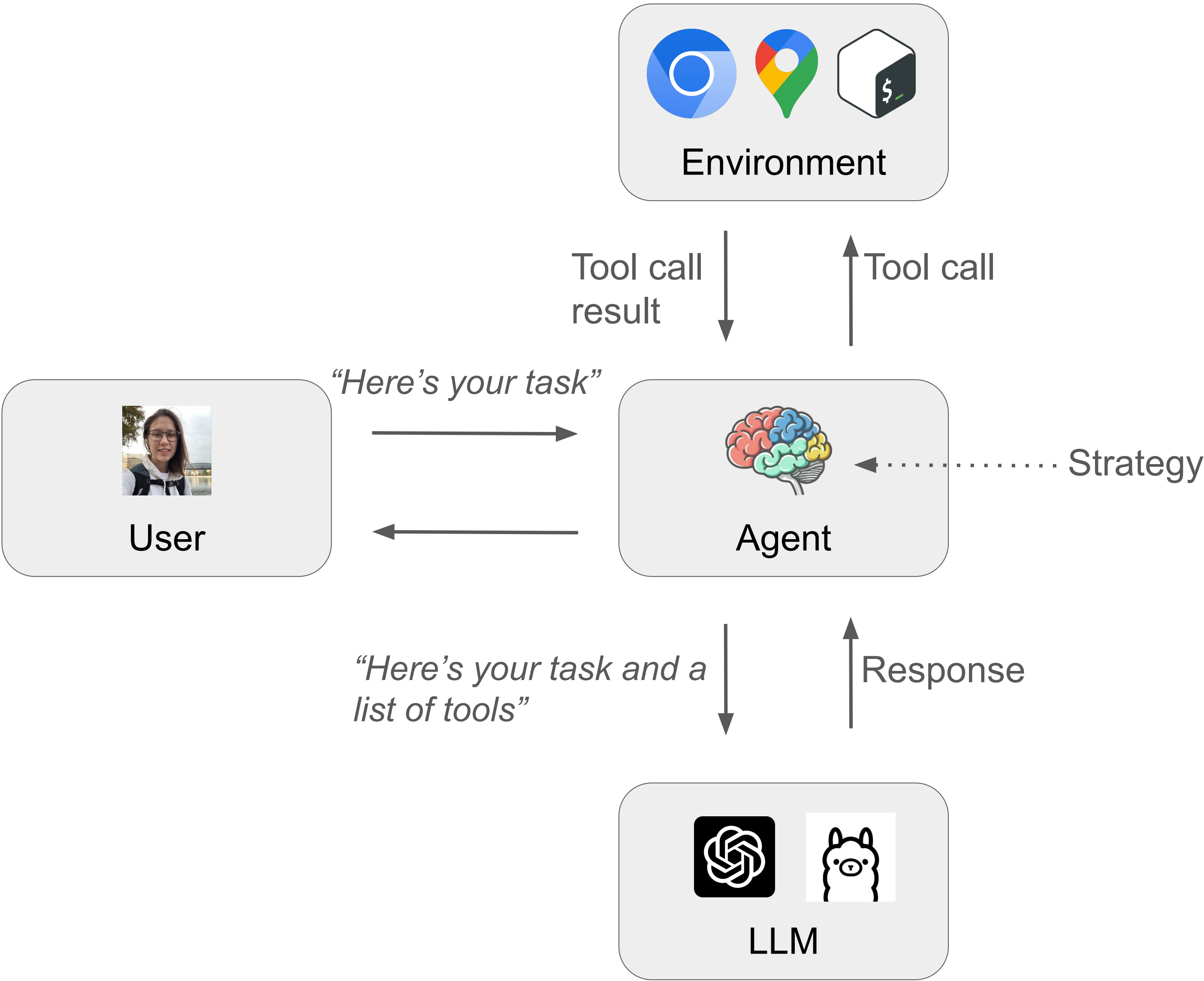
# Tools



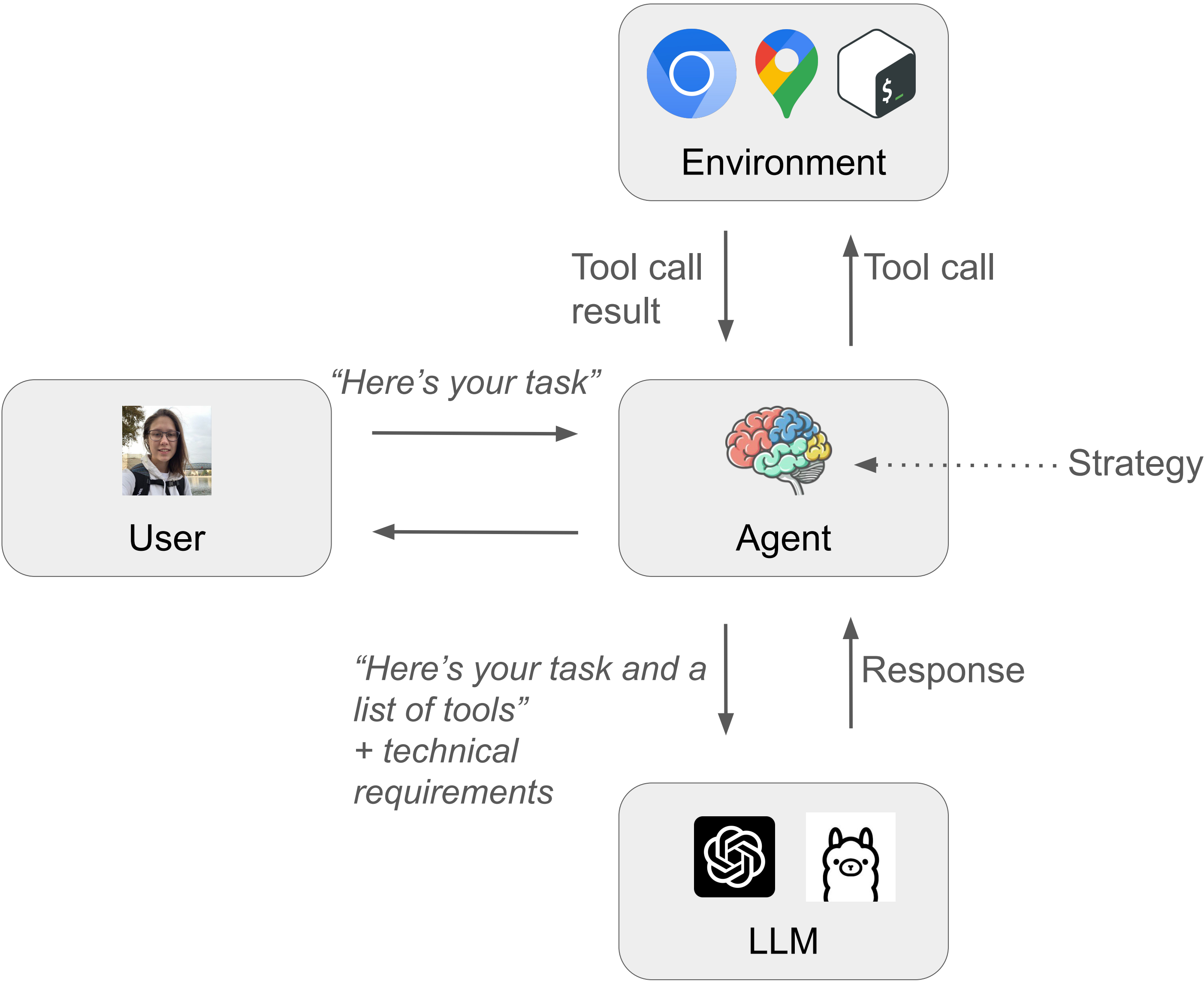
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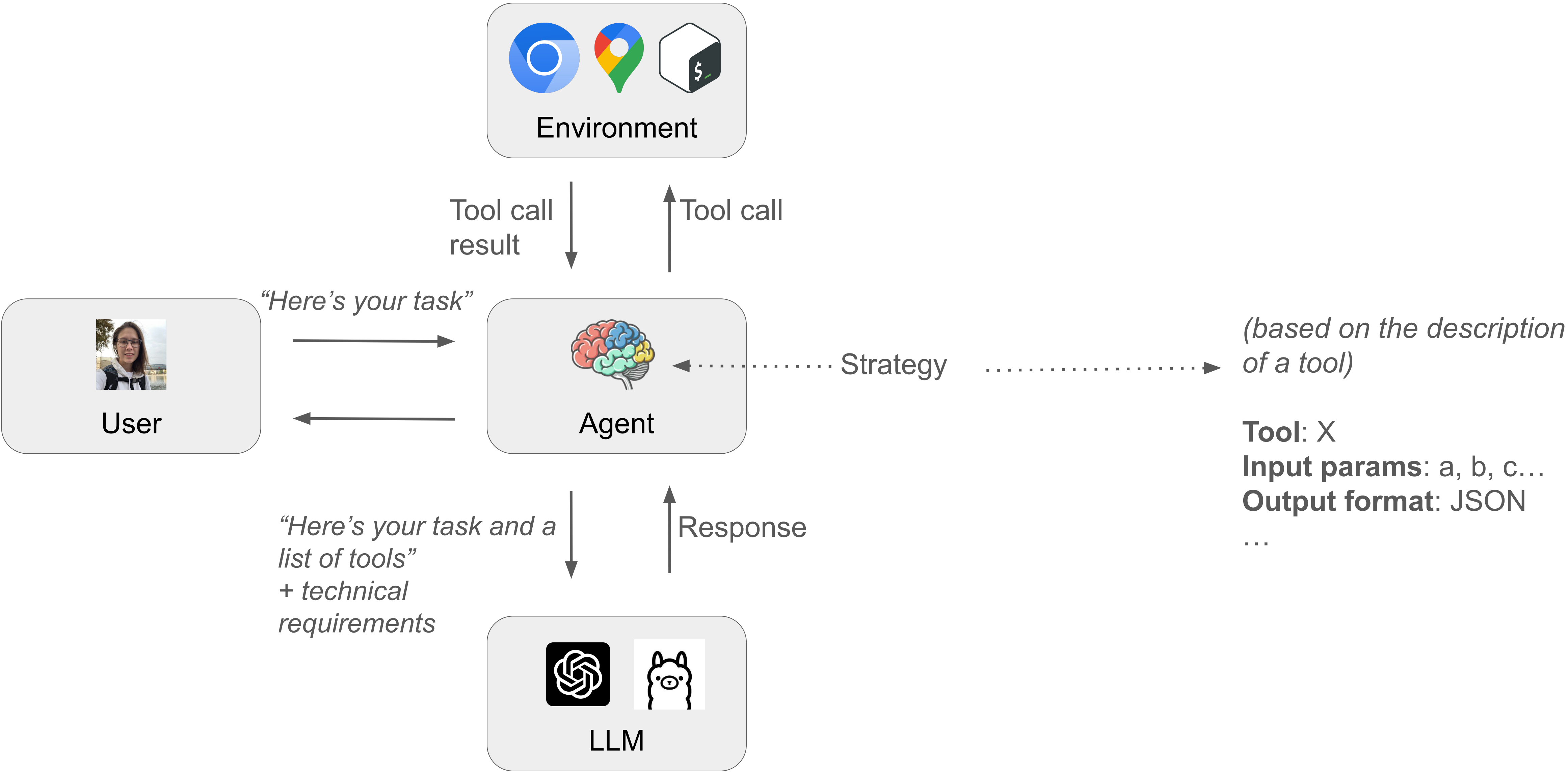
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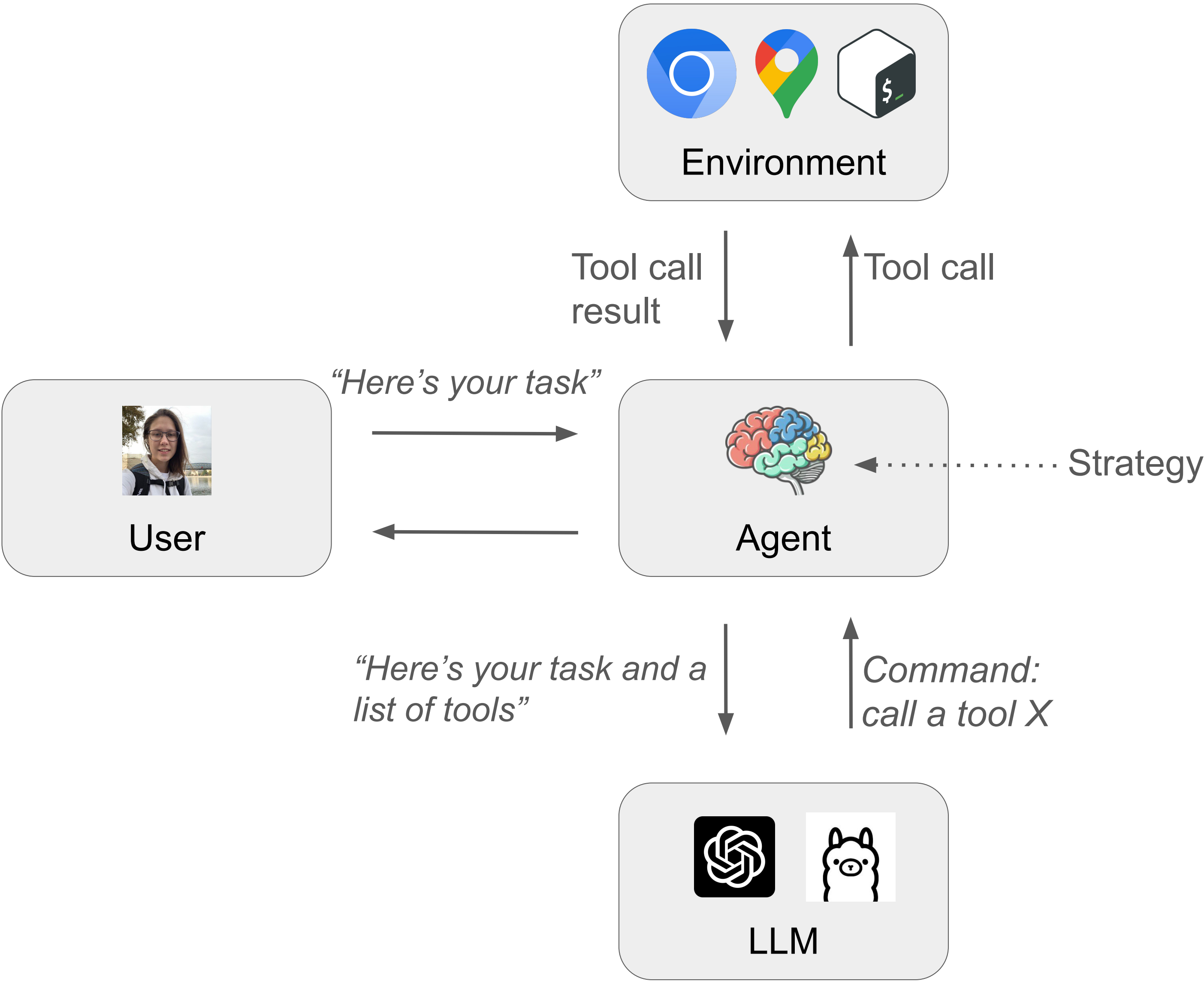
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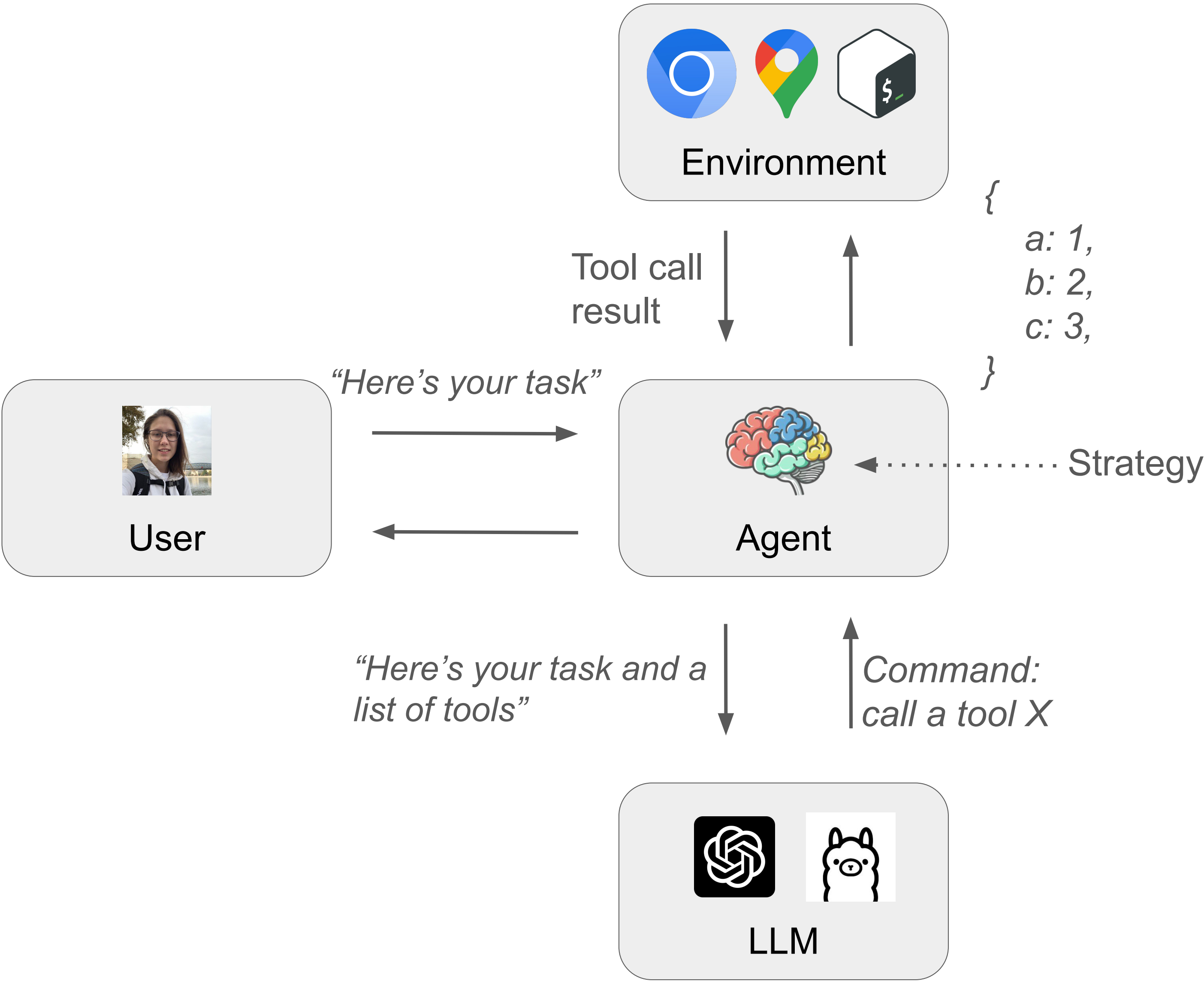
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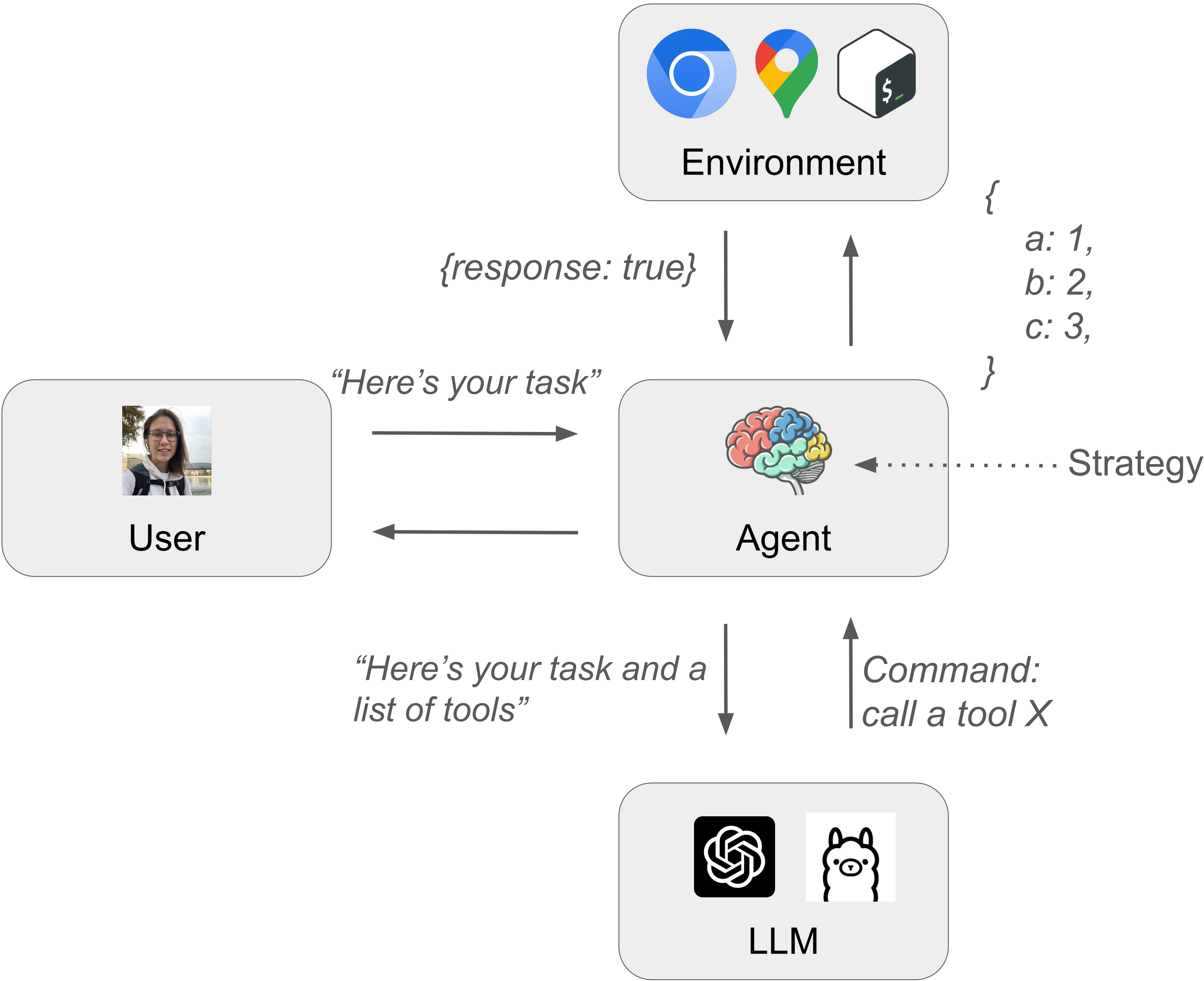
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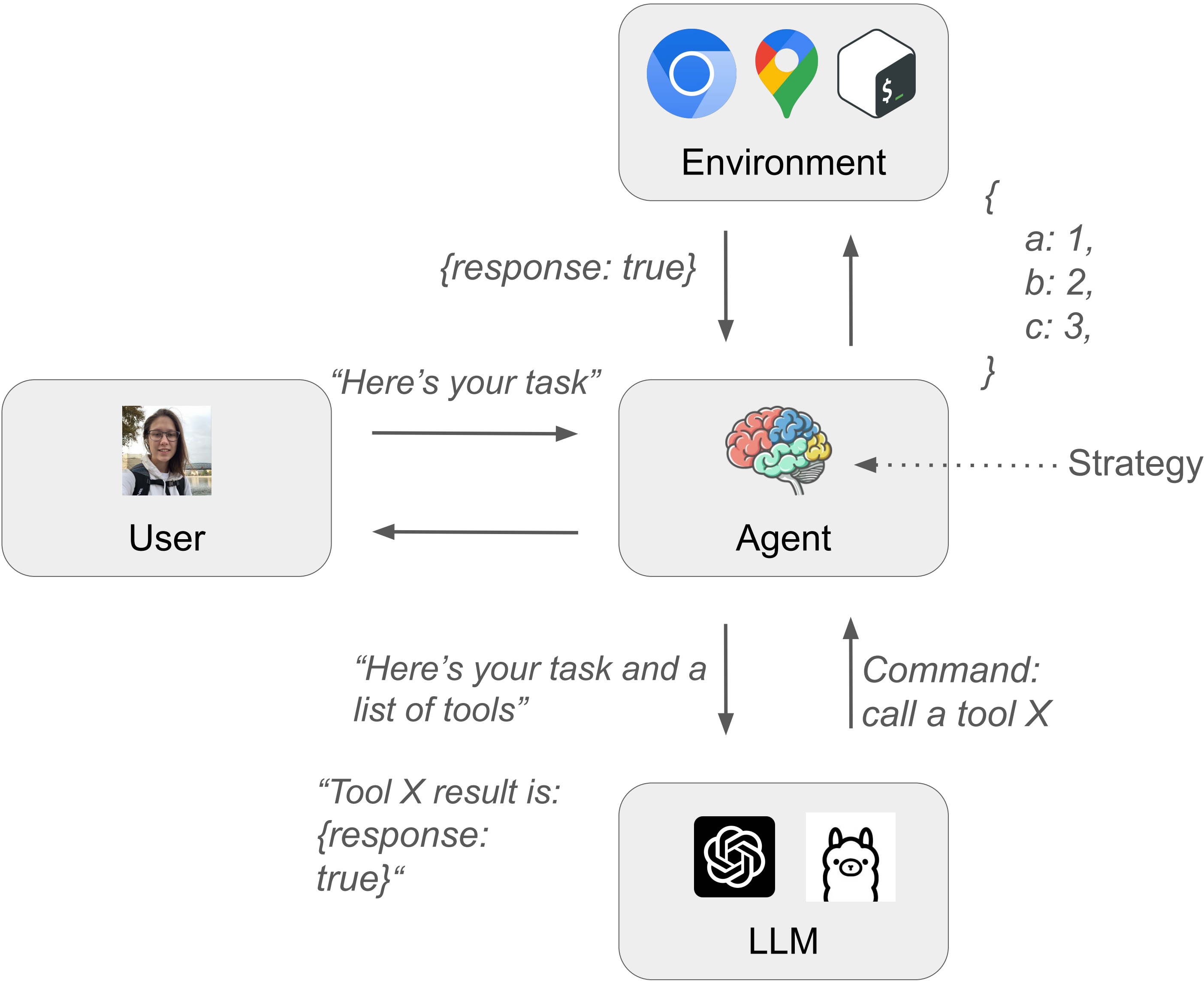
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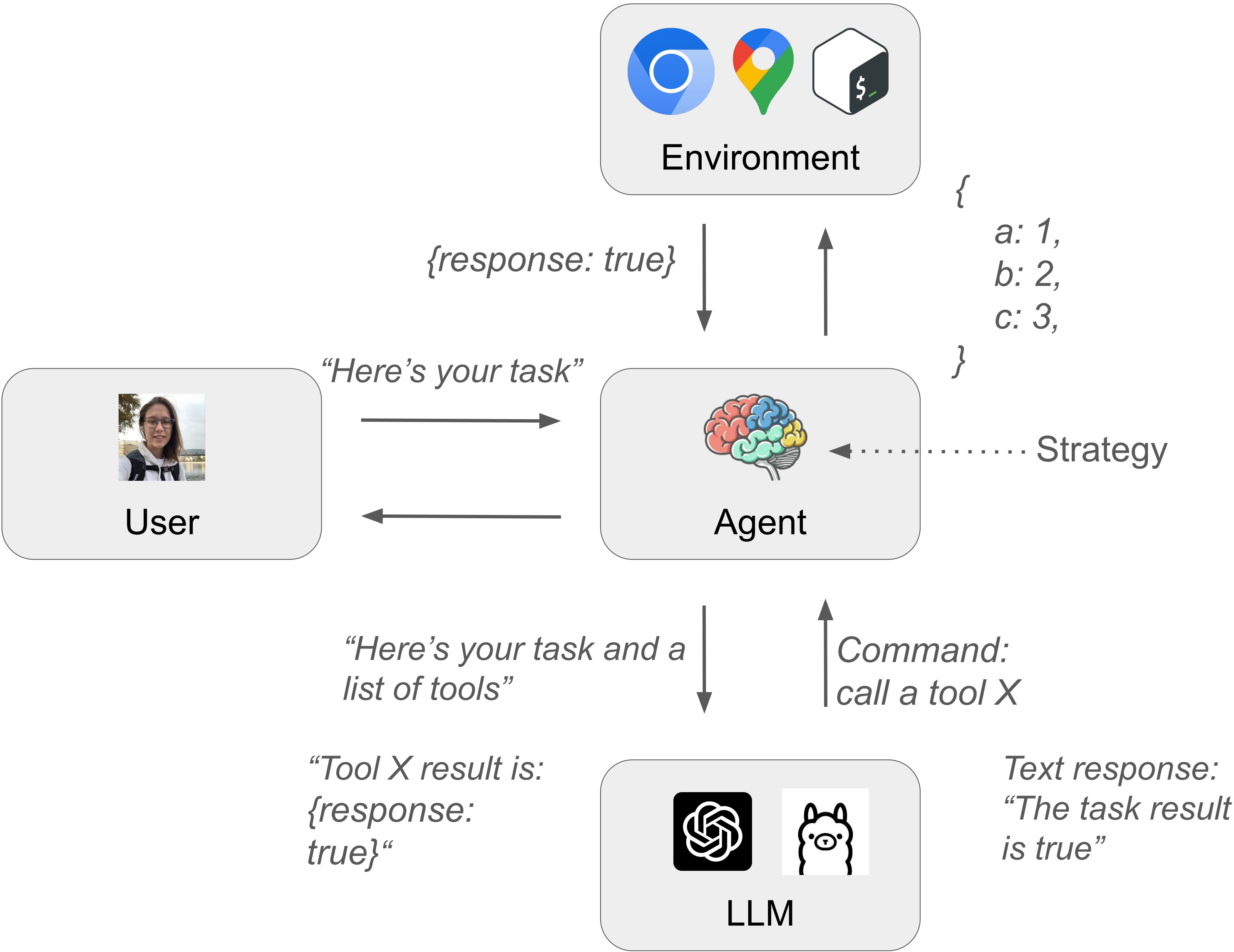
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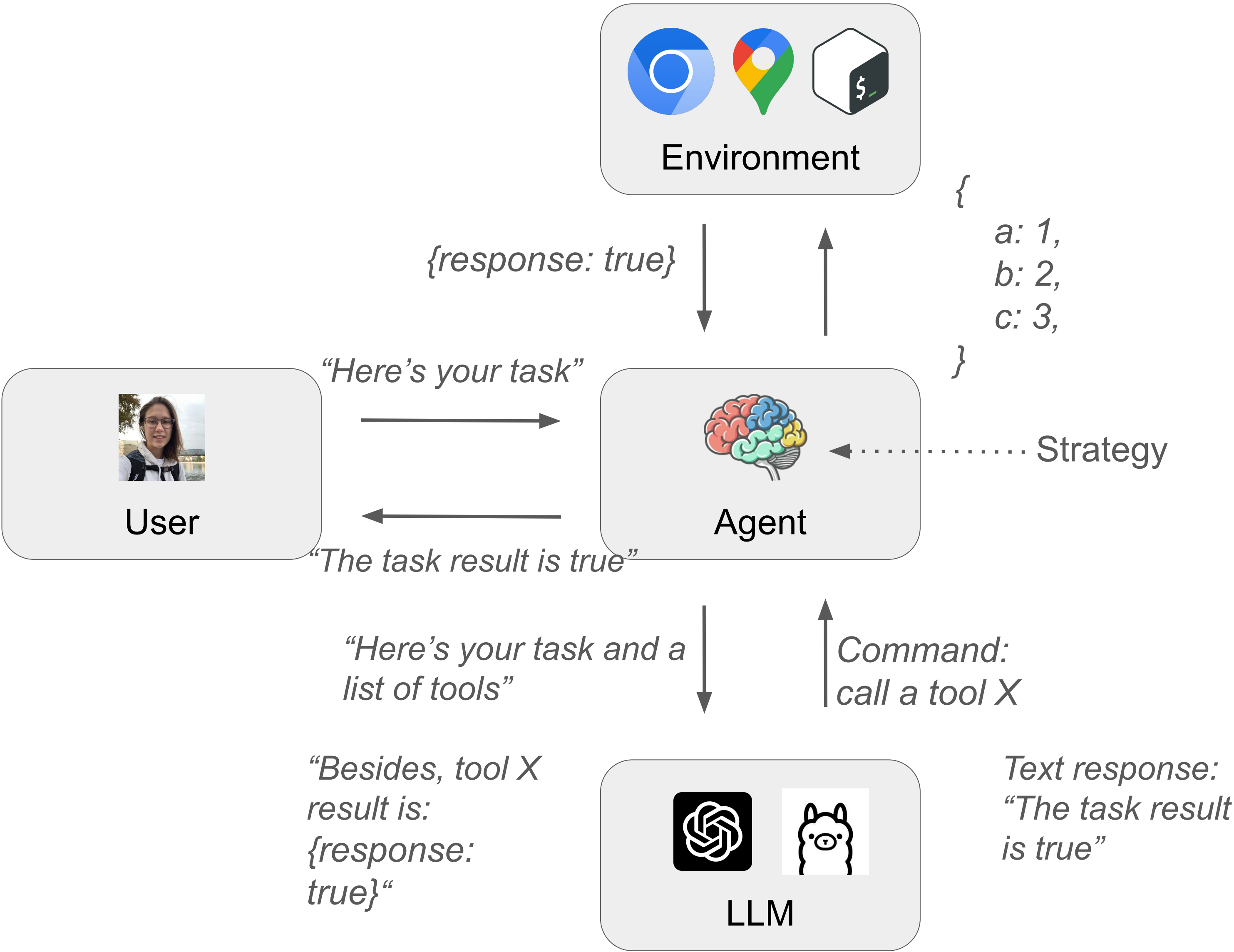
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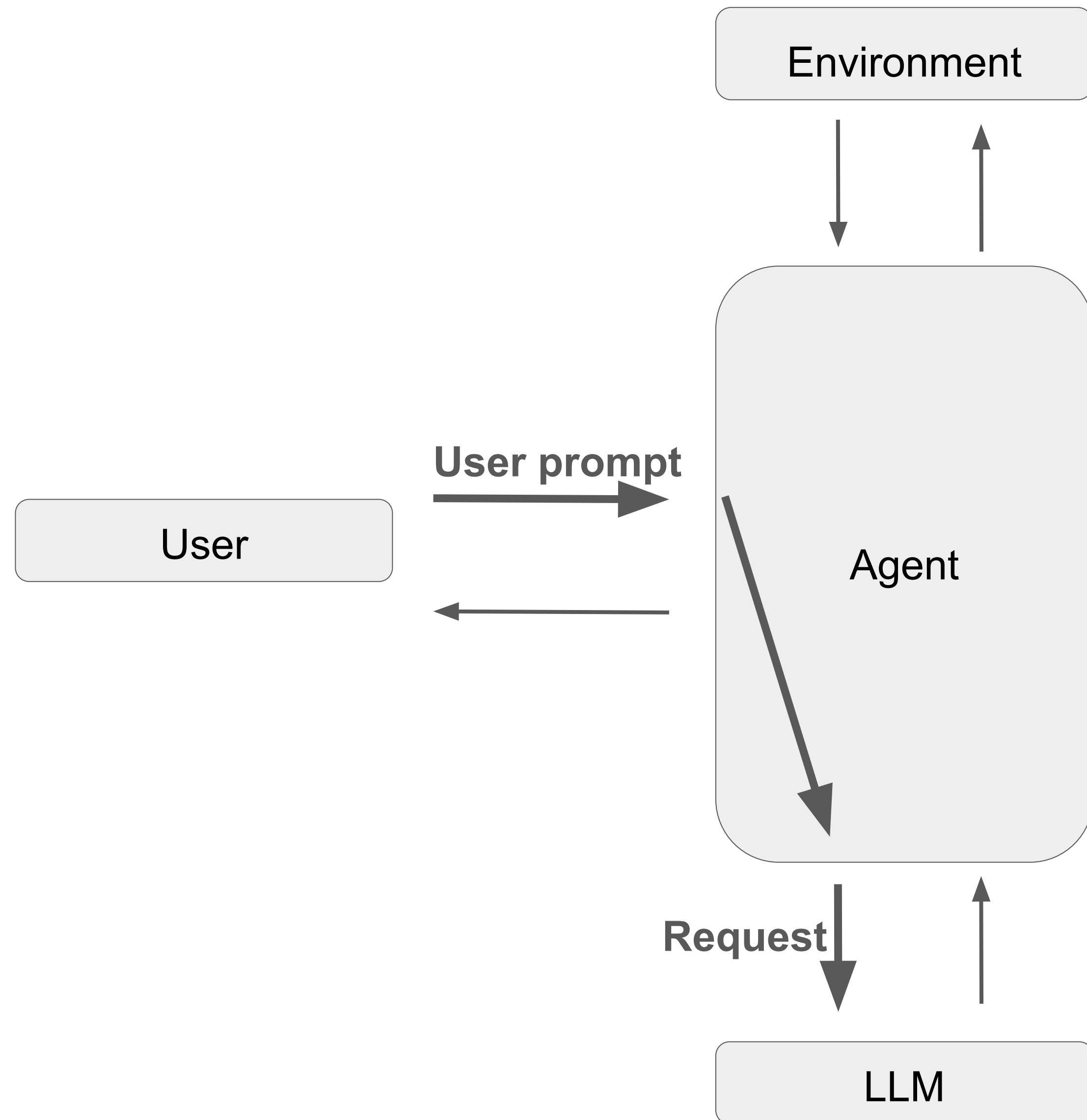


# Tools



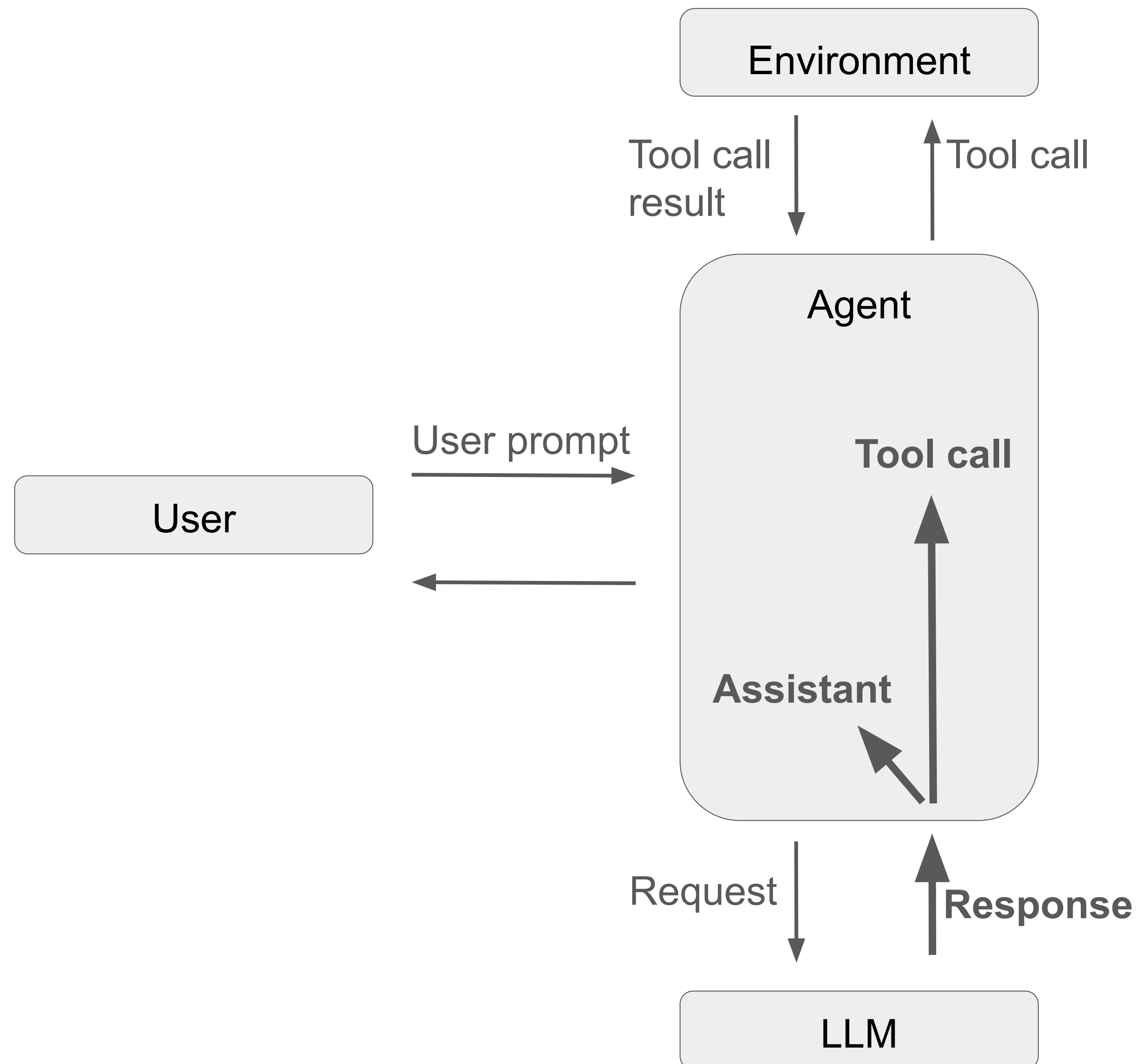
-  03-ToolTask.kt
-  04-ToolSetTask.kt
-  05-ToolRegistryTask.kt

# singleRunStrategy



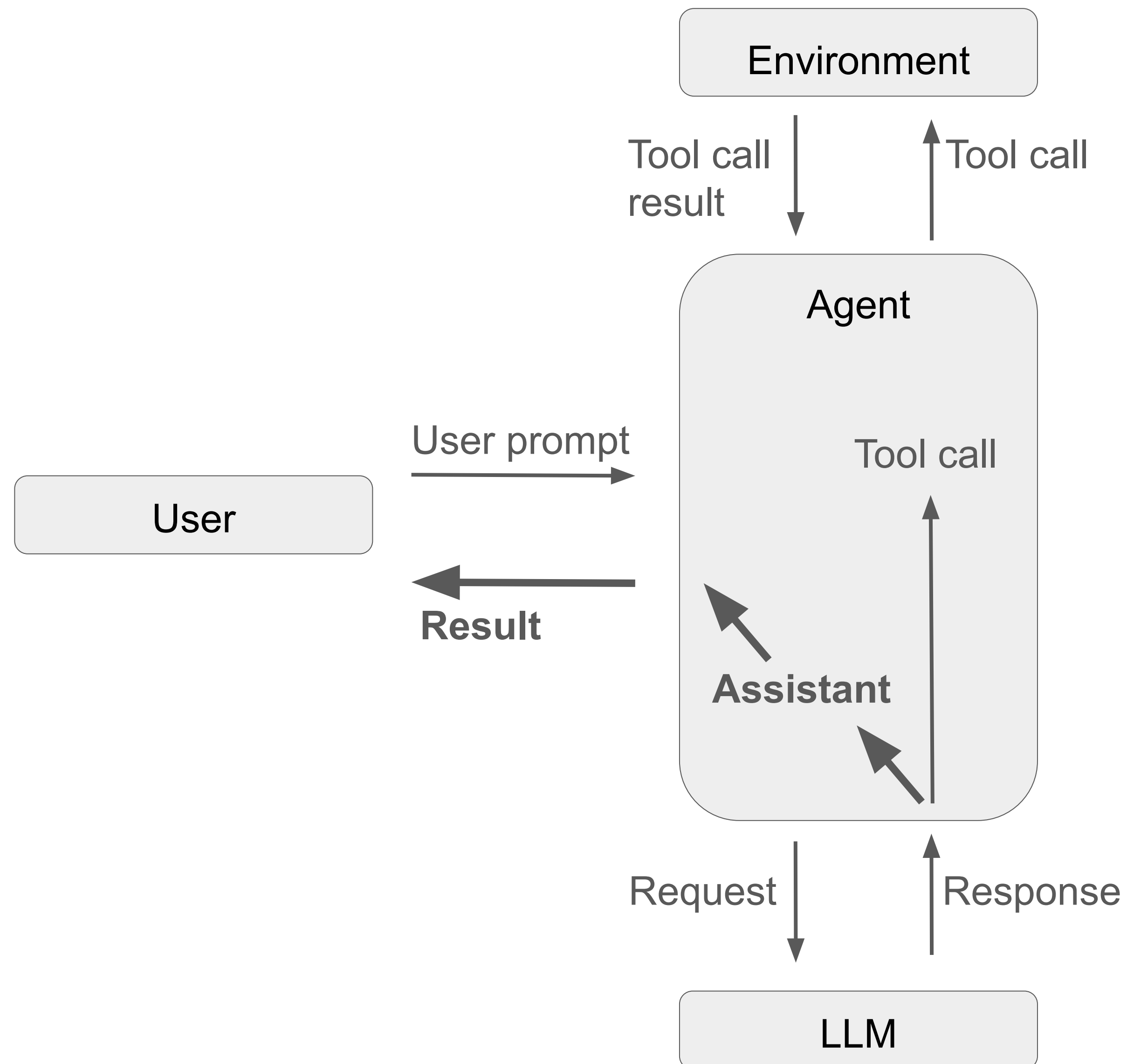
1. Gets user message and sends to the LLM

# singleRunStrategy



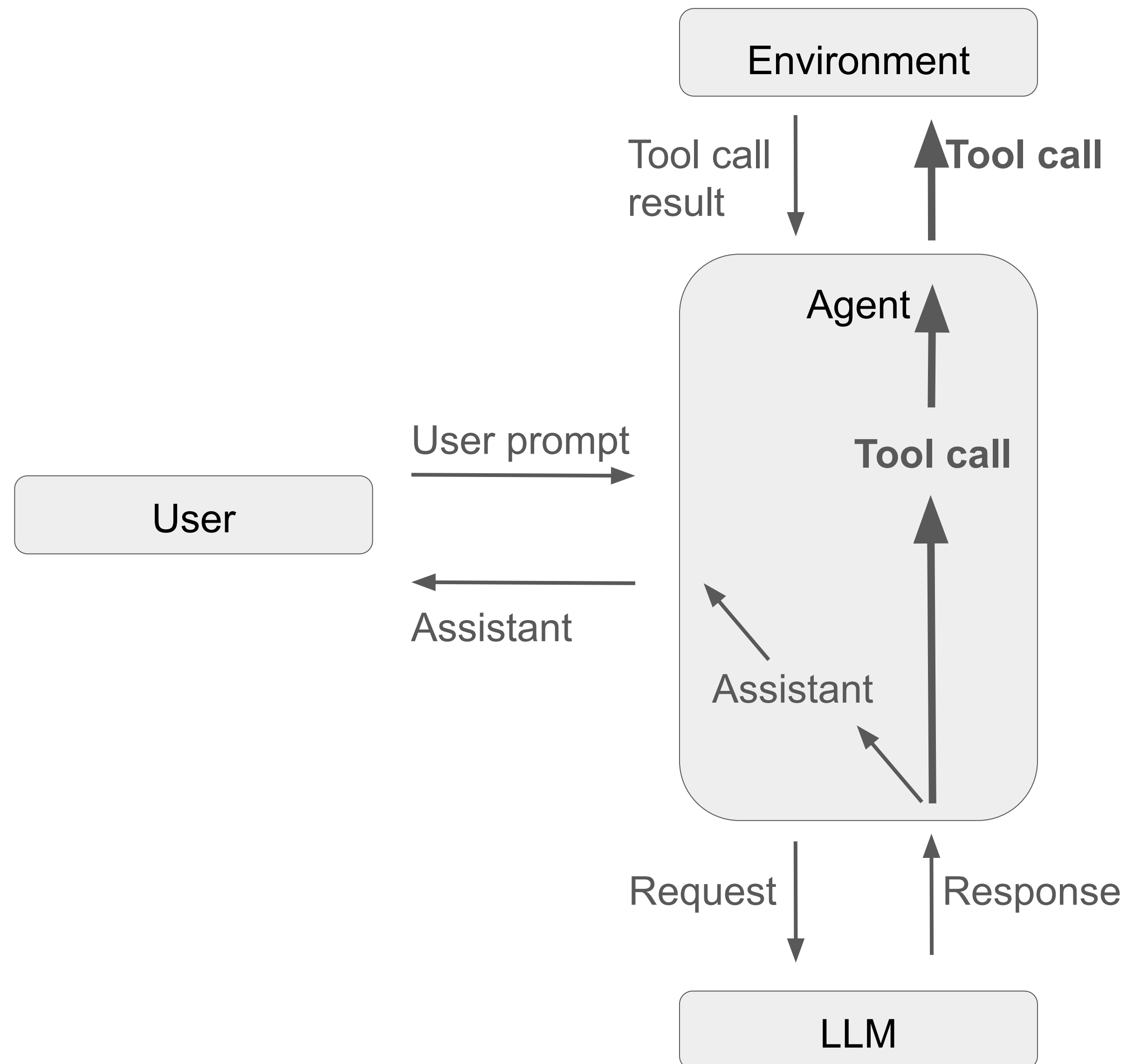
1. Gets user message and sends to the LLM
2. Gets the response (can be Assistant or Tool.Call message)

# singleRunStrategy



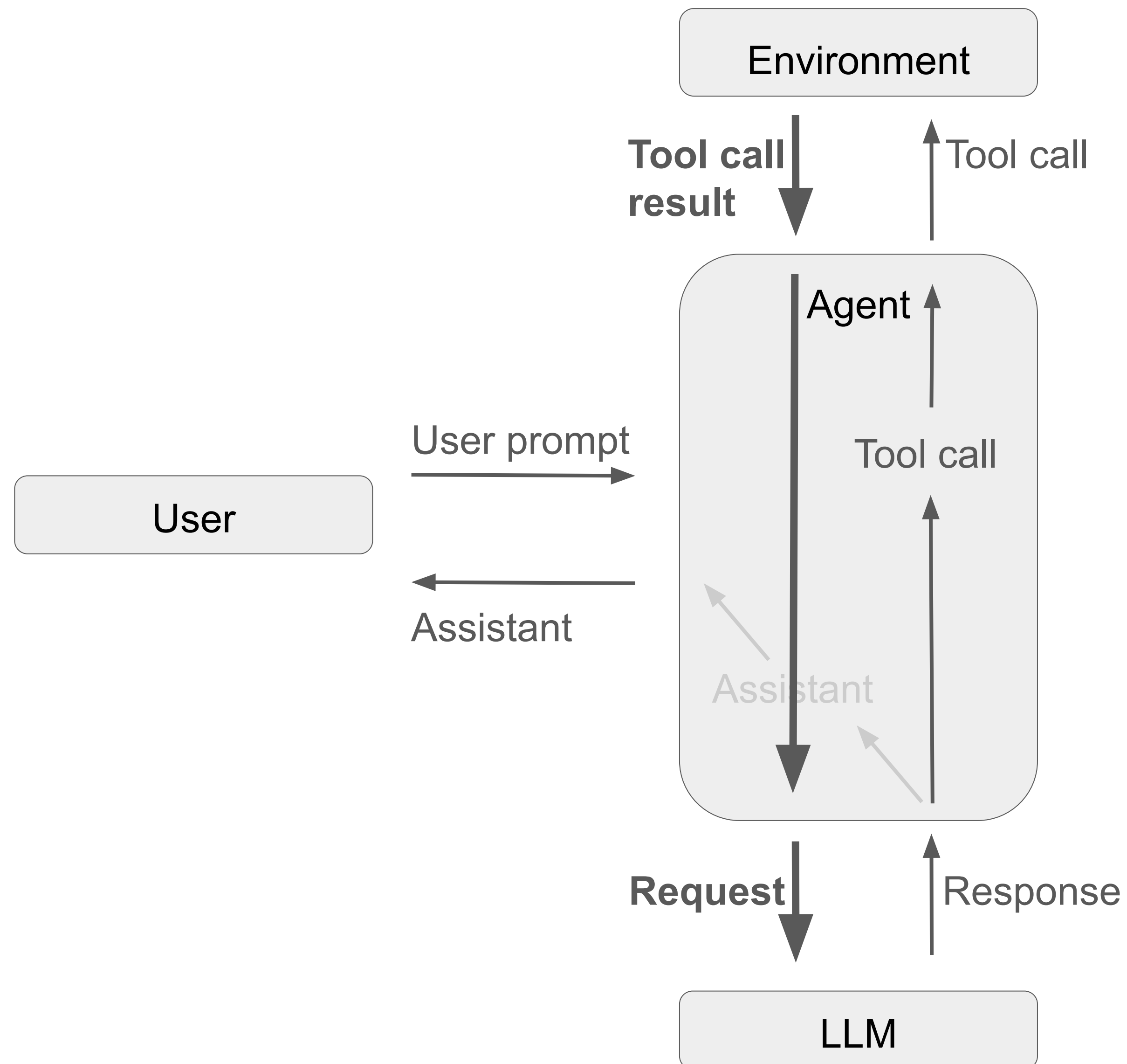
1. Gets user message and sends to the LLM
2. Gets the response (can be Assistant or Tool.Call message)
3. If Assistant returns the content to user

# singleRunStrategy



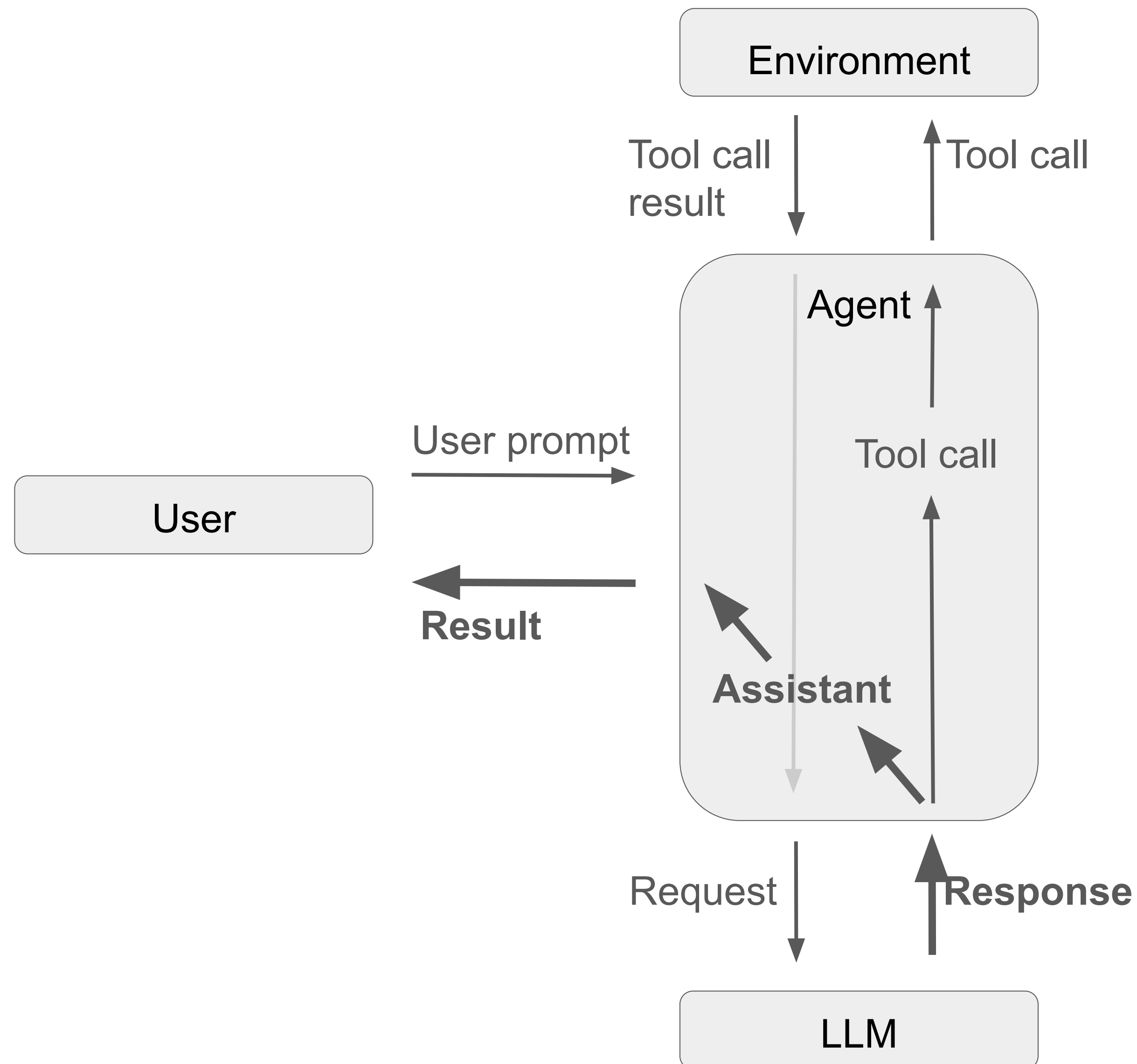
1. Gets user message and sends to the LLM
2. Gets the response (can be Assistant or Tool.Call message)
3. If Assistant returns the content to user
4. If Tool.Call executes the tool

# singleRunStrategy



1. Gets user message and sends to the LLM
2. Gets the response (can be Assistant or Tool.Call message)
3. If Assistant returns the content to user
4. If Tool.Call executes the tool
5. Gets the Tool.Result and sends back to the LLM

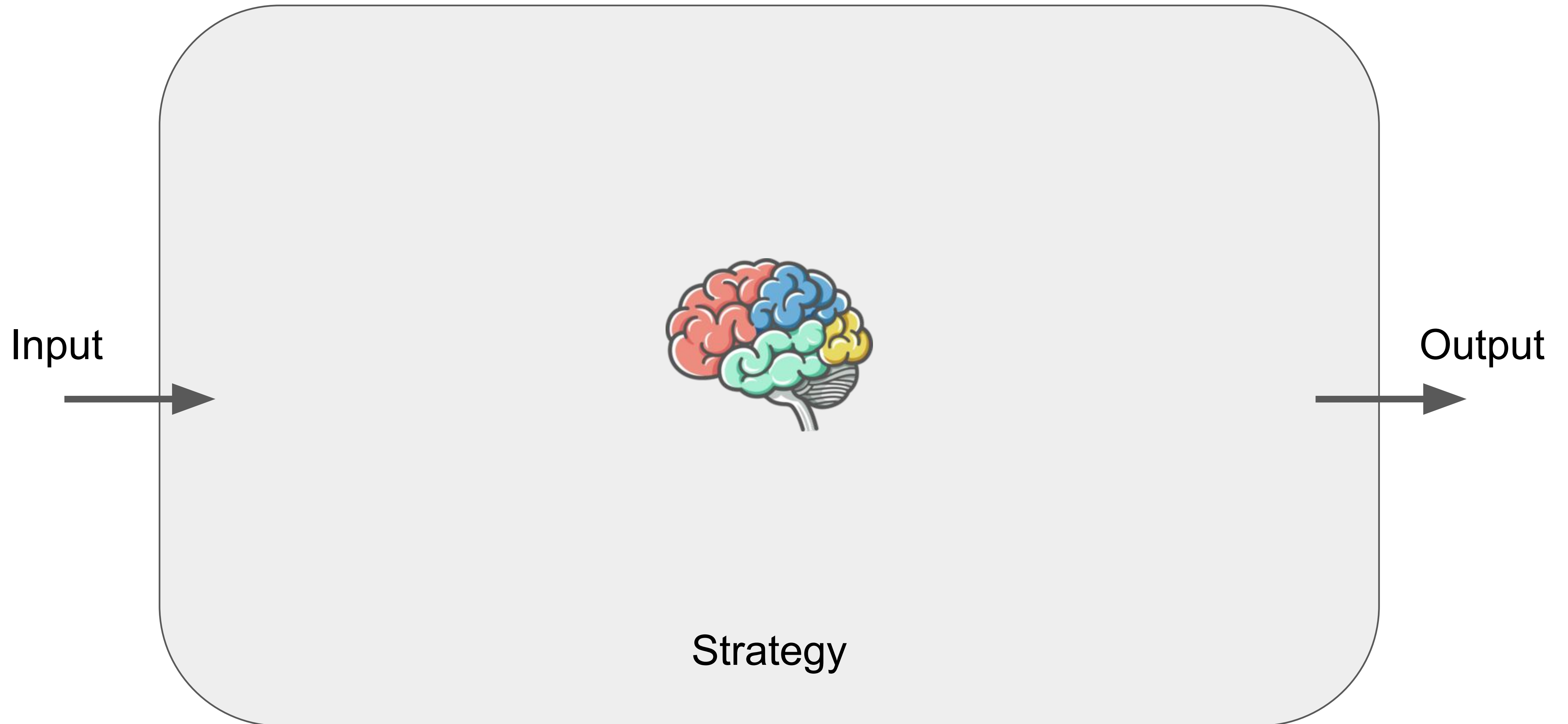
# singleRunStrategy



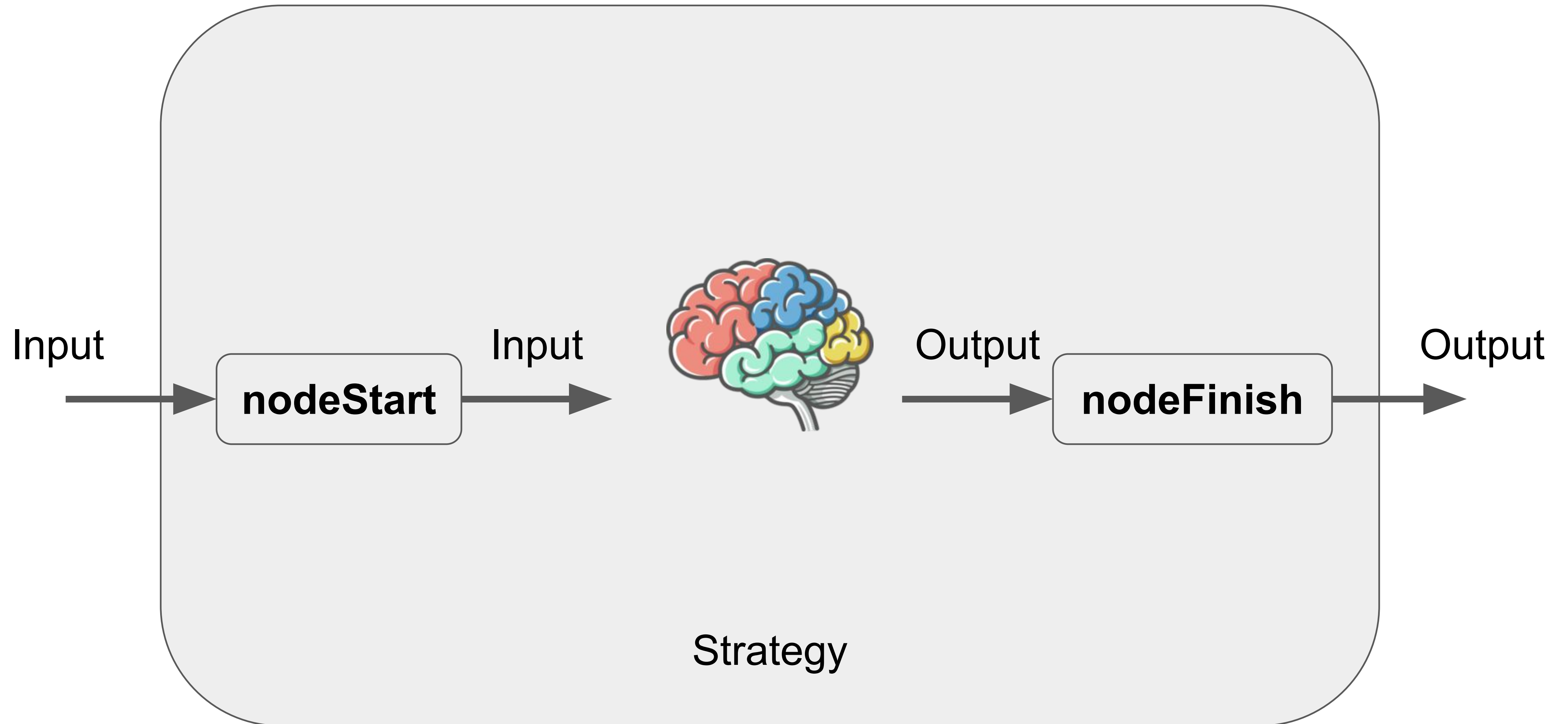
1. Gets user message and sends to the LLM
2. Gets the response (can be Assistant or Tool.Call message)
3. If Assistant returns the content to user
4. If Tool.Call executes the tool
5. Gets the Tool.Result and sends back to the LLM
6. Repeats starting from 2.

 06-SimpleAgent.kt

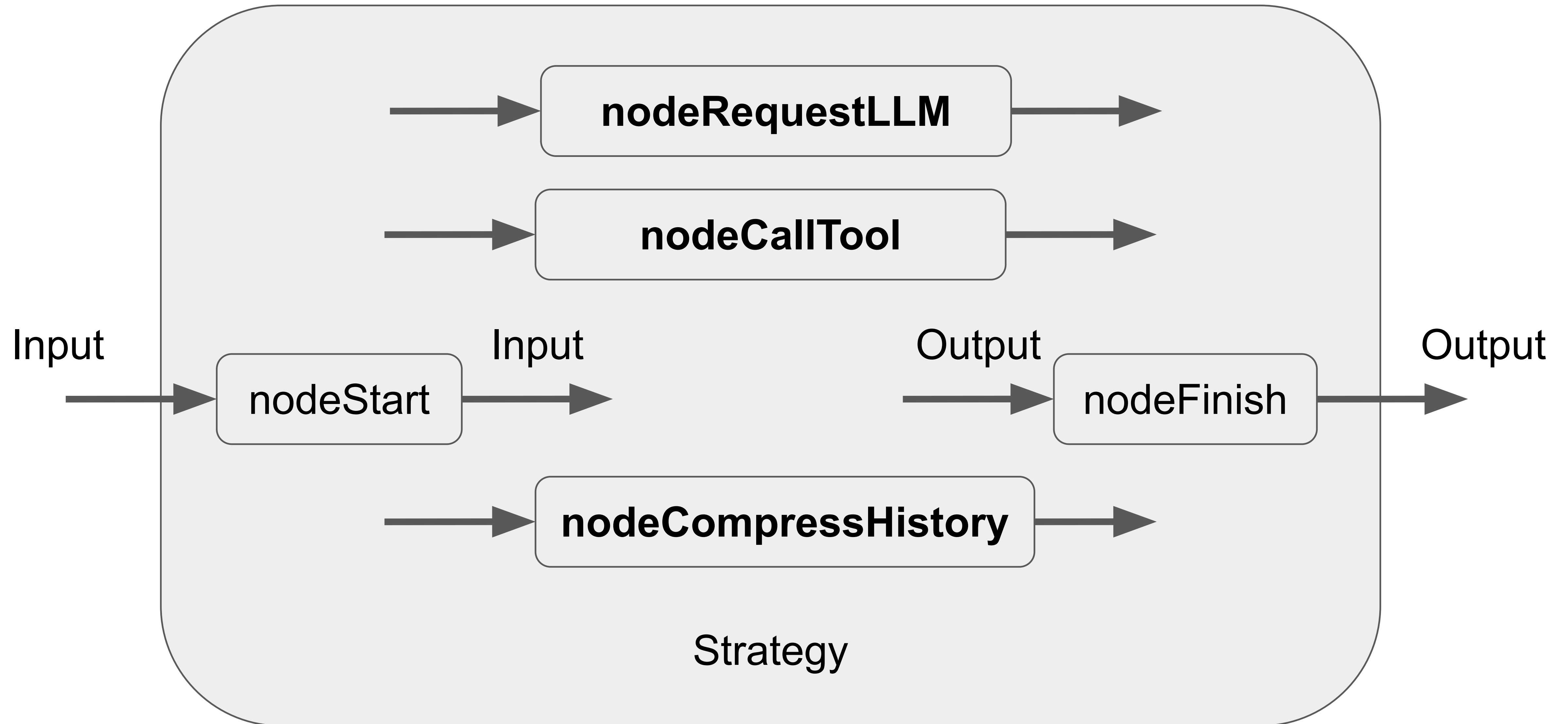
# Strategy, Node, Subgraph



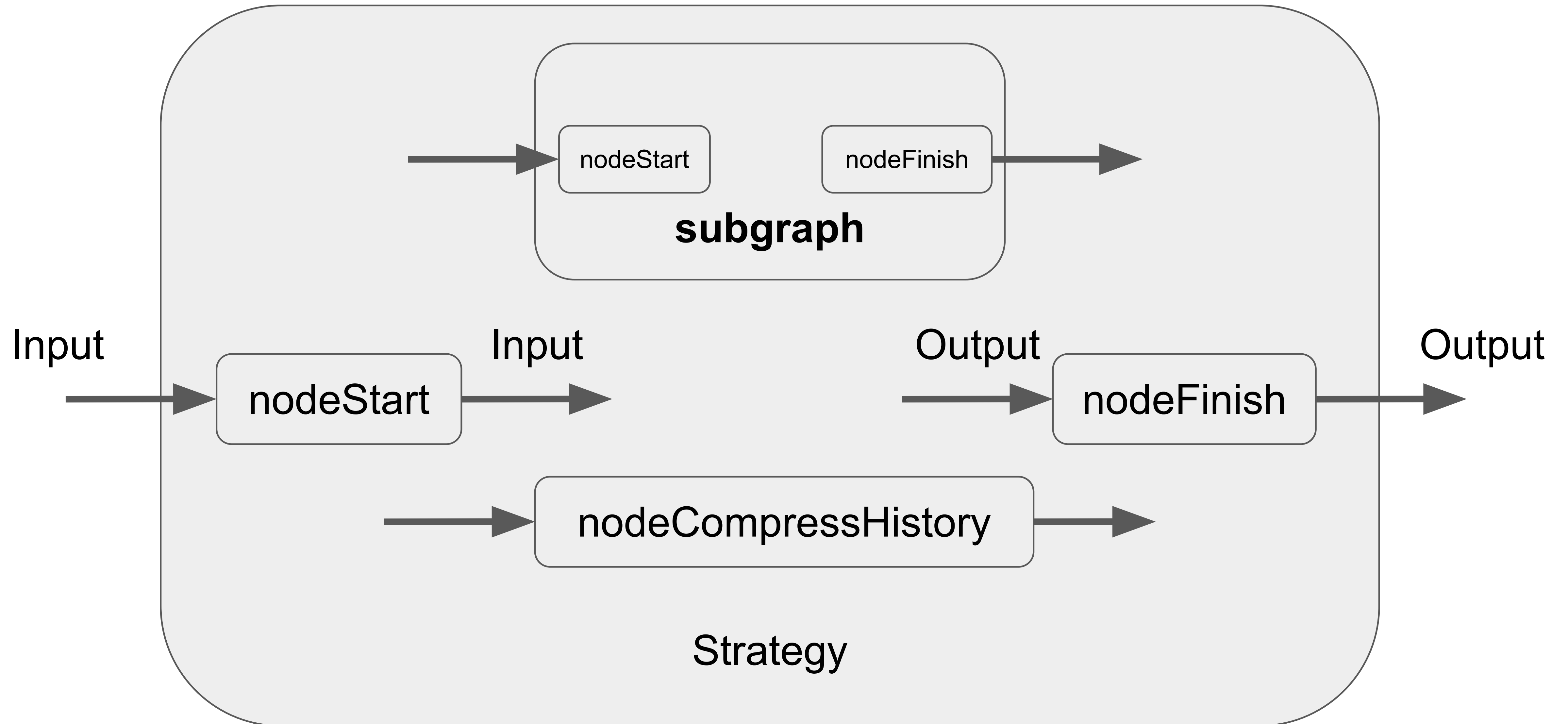
# Strategy, Node, Subgraph



# Strategy, Node, Subgraph



# Strategy, Node, Subgraph



-  08-StrategyWithBasicNodes.kt
-  10-StrategyWithTools.kt
-  11-StrategyWithSubgraph.kt
-  11-StructuredOutput.kt
-  12-PredefinedNodes.kt

```
git clone https://github.com/tiginamaria/koog-workshop  
git checkout assignments
```

# Working with assignments

1. Select the one you like more;
2. Work individually or in pairs;
3. You can modify the idea/goals, but please provide the description and a reason of changes;
4. You can come up with your own project idea – feel free to discuss with the lecturers!
5. Work iteratively, ask questions – we're here for you :)

List of the proposed projects:

<https://github.com/tiginamaria/koog-workshop/blob/assignments/ASSIGNMENTS.md>

# Working with LLM providers

1. Ollama – local models, free of charge;
2. Anthropic/OpenAI – a key per project with a spend limit;
3. You can play with the test keys and decide which provider suits you best.

# Timeline

- **This week (until November) – team up and select project**, drop message to tg with team content and project you selected (or describe yours)
- **November, 18 – additional lecture** about Koog, advanced features
- **December, 2 – soft deadline for projects**, we will have a separate 15-30 mins call with each project, where you will show the intermediate results, ask questions, get feedback from us (what to improve before the final deadline)
- **December, 16 – hard deadline for projects**, we will have 10-15 mins presentation about each project, slides are welcome, but you can just show IDE, run agent and explain what it does

Questions?

Thanks for attending!