A0597203 AI Business Applications

Introduction to Agentic AI

https://www.knime.com/events/data-aware-agentic-ai-getting-started-course

Learning Objectives

- Describe the building blocks of agentic AI
- Highlight the advantage of the autonomous nature of agentic AI to solve complex tasks
- Understand and list properties of tools
- Construct tools that follow the requirements of an agentic AI framework
- Understand the process of how an agent solves a task
- Implement agents in KNIME Analytics Platform with required inputs

Scenario 1

- Imagine you have three workflows:
  - One for sentiment analysis
  - One to pull customer data
  - One to draft a personalized email.
- You can combine these together to create a larger streamlined workflow to determine the sentiment from customer communication and respond accordingly in a personalized manner based on the information specific to that customer.

Scenario 2

- Say, you also have several other workflows - to pull the latest transactions, combine data sources, retrieve the latest exchange rates, generate personalized images…
- By combining these workflows, you have countless possibilities of what you can accomplish.
- However, that involves generating countless meta-workflows, or combinations of workflows, and that requires a tremendous amount of time and effort.
- Consequently such an approach may sound very impractical.
- But what if we can combine necessary workflows on the fly to accomplish whatever the task that is needed?

Agentic AI

- Agentic AI accomplishes this by combining and orchestrating different tools to complete a required task.
- Based on the input from the user, an AI agent identifies necessary tools, combines them in a correct order, monitors their executions, mediates their inputs and outputs, and formulates the final outcome the user can understand.
- In this chapter we will learn how agentic AI works by examining its building blocks.

Example Workflows

KNIME Learning Center

Download the example workflows

This course does not include exercises. To earn your microcredentials, you'll need to complete a knowledge check at the end.

You can, however, download the example workflows featured throughout the course and explore them to apply the knowledge you have acquired.

Download the **example workflows** from the KNIME Community Hub.

DOWNLOAD

Building Blocks of Agentic AI

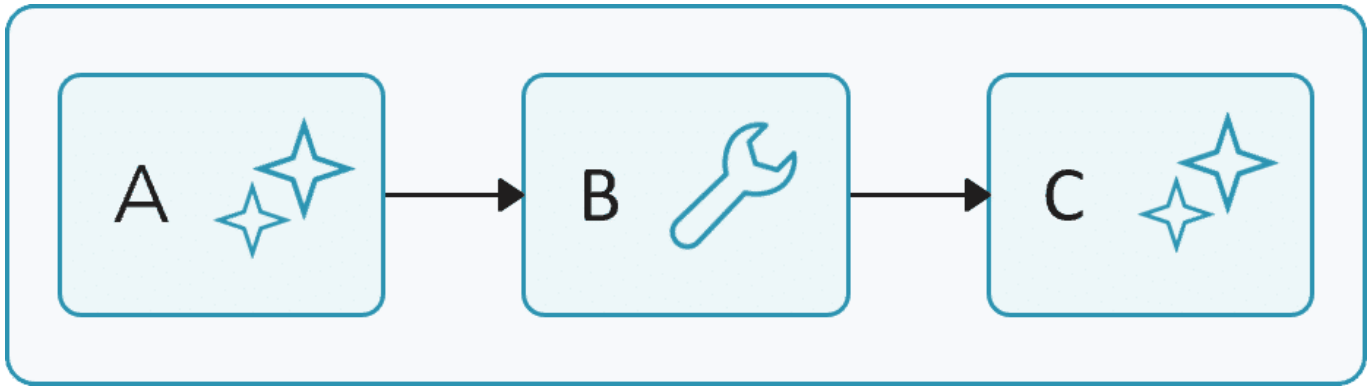
- Agentic AI consists of a collection of tools specialized in different tasks, and an agent that calls them to accomplish the request by the user.
- There is a repository of tools available for the agent to use.
- The agent accesses these tools from the repository, combining them dynamically to accomplish the required process.
- In KNIME Analytics Platform, tools are workflows specialized for designated tasks. Such tools can be a modified version of an existing workflow, or constructed from scratch.
- These tools have the ability to receive input from an agent and return the output to the agent. A tool may be able to accomplish a particular task with or without using AI.

Tools

- Workflows specialized for different tasks. Tools can be called by an agent, with a mechanism to receive input from and to return output to an agent.
- We consider two classes of tools: classic tools – or simply tools, and intelligent tools:
  - Classic Tools (or simply Tools)
    - Perform a designated task without using AI
    - Examples: data aggregation, classification, numeric prediction, data transformation
  - Intelligent Tools
    - Perform a designated task using AI models
    - Examples: summarizing document, machine translation, sentiment analysis

Workflow

- A series of tools, intelligent or otherwise, can be incorporated into a workflow to implement complex functionality. In such a framework, referred to as AI workflows, tools are connected to form meta-workflows. During the process the output from one tool is used as the input to another tool. For example, one intelligent tool identifies a customer from the information given in a prompt, then a tool retrieves all the support tickets associated with that customer, and finally an intelligent tool composes a summary of all the tickets to be sent by email.

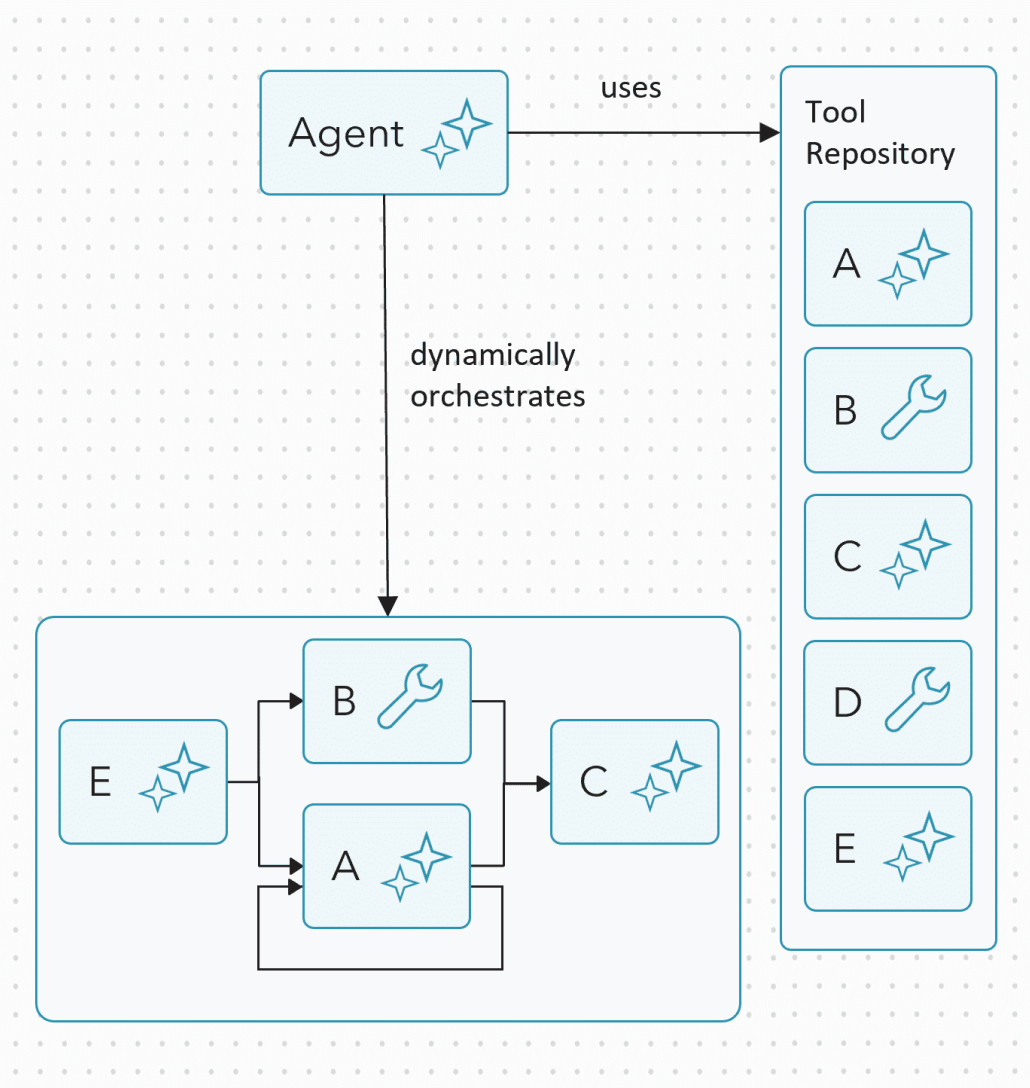


Agent

- The sequence of tools in an AI workflow is predetermined and fixed.
- To perform another task, an entirely new AI workflow needs to be constructed with a different sequence of tools.
- For example, an AI workflow to gather information about a product is different from an AI workflow to retrieve information about a customer.
- Rather than custom-building a combination of tools for each task, an intelligent agent can combine tools necessary to accomplish each task.
- An agent in agentic AI is an autonomous software system that is capable of perceiving its environment, reasoning about it, making decisions, and taking actions to achieve specific goals.
- In a more practical sense, an agent is able to decide to utilize one or more of the tools at its disposal to achieve its goal.

Agent

- Autonomous software system that can perceive its environment, reasoning about it, making decisions, and taking actions to achieve specific goals.
- It can combine tools at its disposal to achieve the goal to produce the desired outcome.

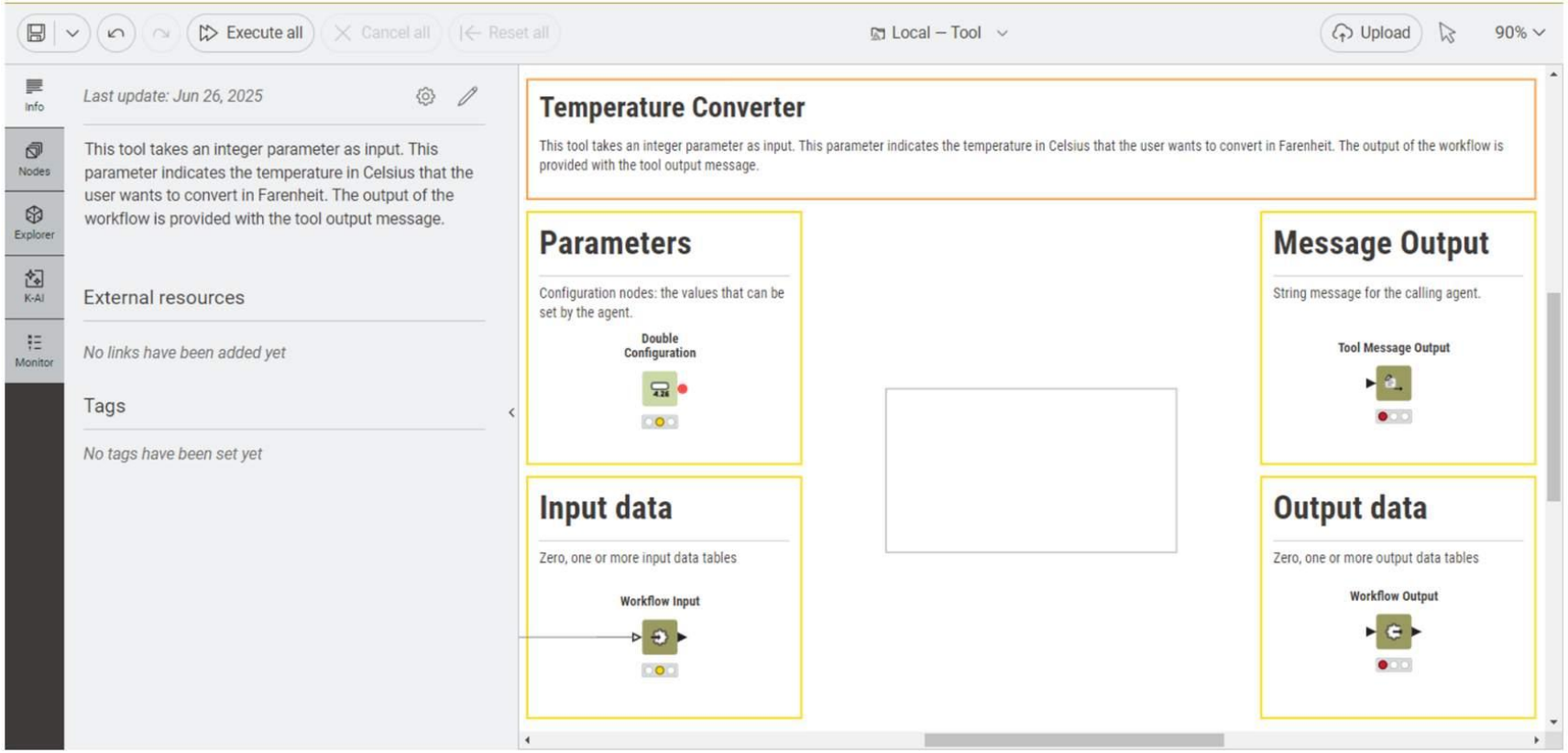


Understanding Properties of Tools

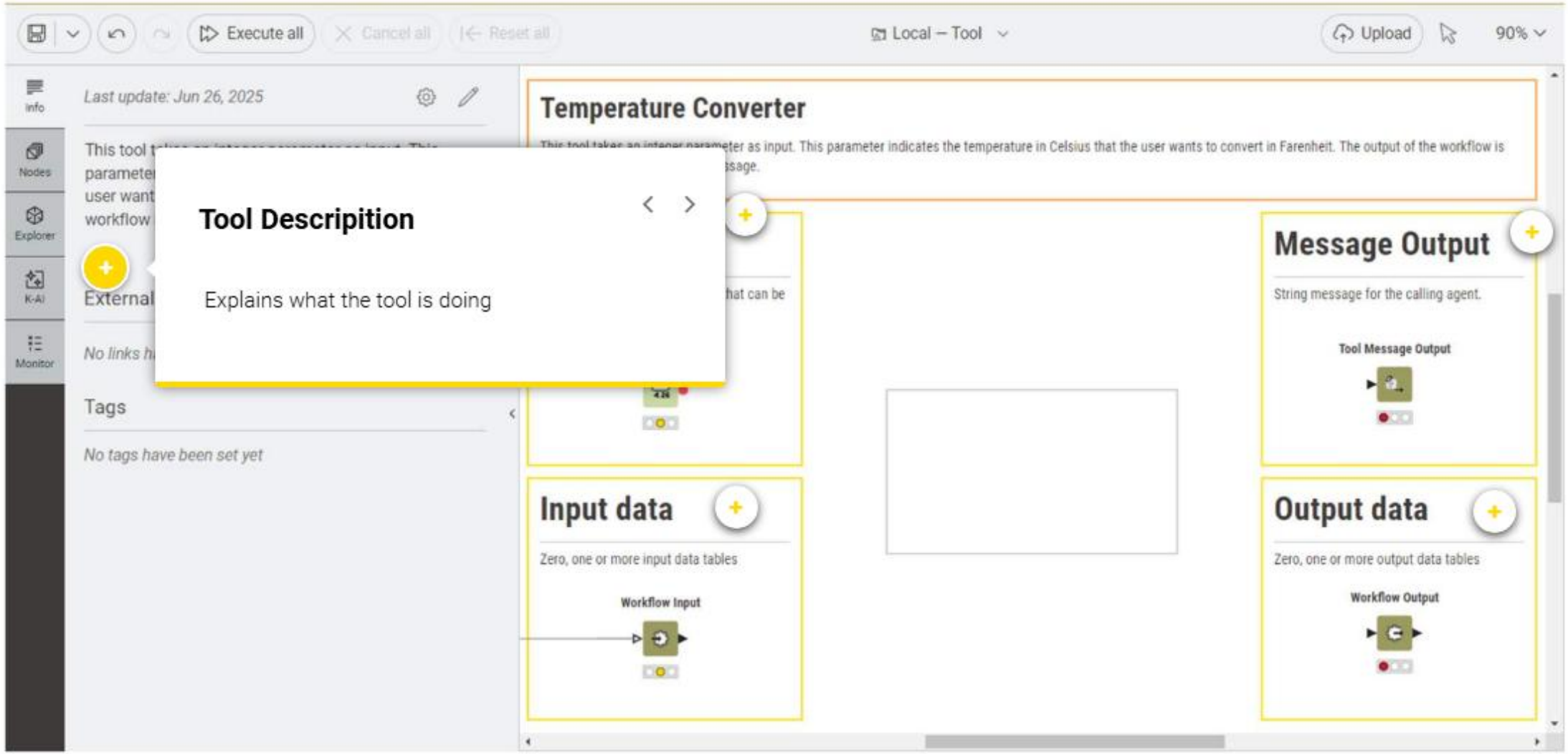
- In KNIME analytics platform, a tool is a workflow that the agent can call to perform a specific task during its reasoning process.
- Tools provide the agent with functionality it can use while thinking step-by-step about how to solve a problem.
- Tools can optionally receive data input from an agent or return a data output to an agent.
- In the following, we introduce two properties tools can have:
  - **Data-aware** tools are tools that access data or perform tasks on some data they receive from an agent. This can be, for example, a Tool that accesses and aggregates customer data from different data sources.
  - **Intelligent** tools are making use of Agentic Al. This can be, for example, a Tool that translates or summarizes a document or a Tool that predicts the sentiment of a message by means of calling a LLM.

Tool = KNIME Workflow

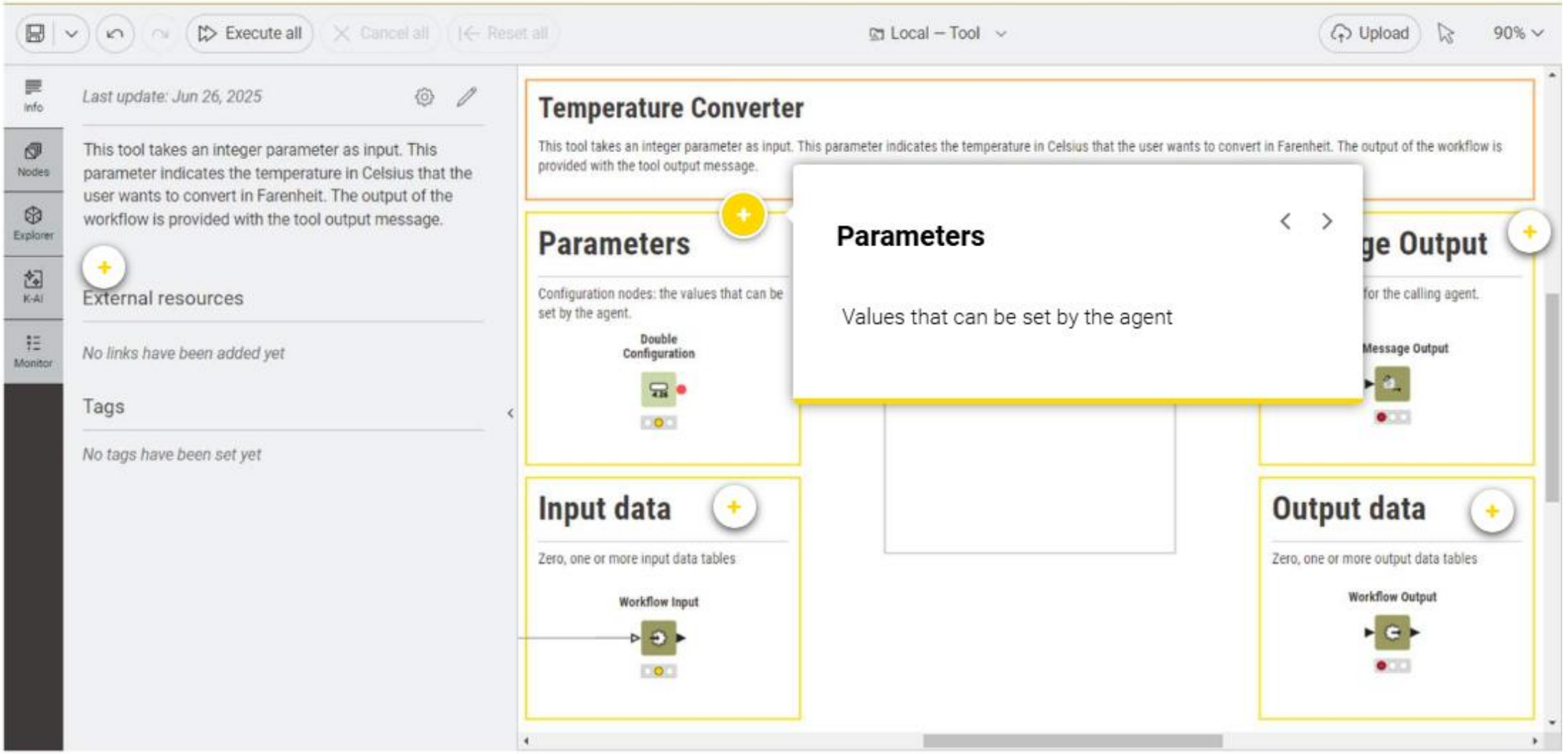
A tool is a KNIME workflow that performs a specific task. However, such workflows contain certain elements that are required to make the workflow a Tool usable by the agent



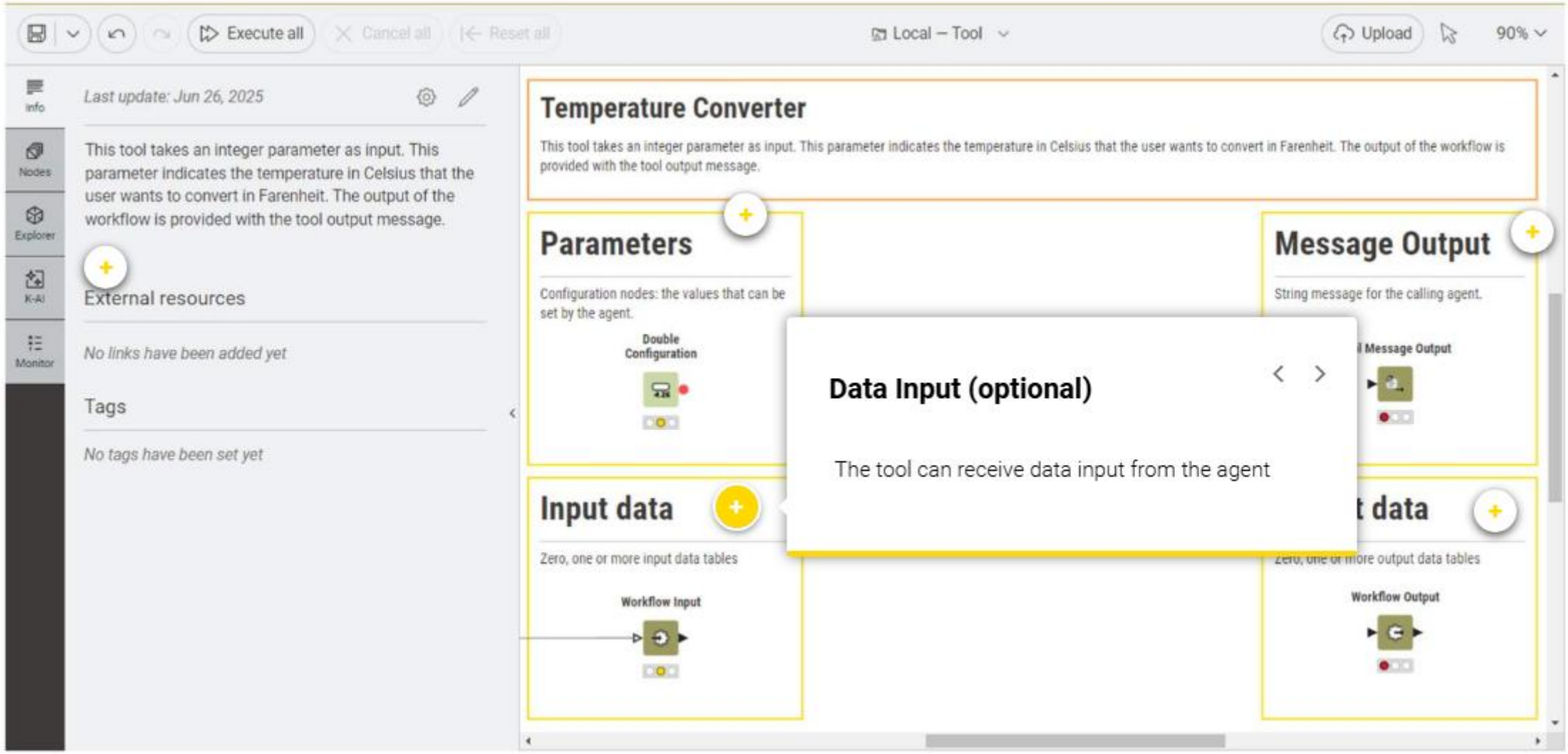
Tool Description



Parameters


Execute all
Cancel all
Reset all
Local – Tool
Upload
90%
Info
Nodes
Explorer
K-AI
Monitor
Last update: Jun 26, 2025
This tool takes an integer parameter as input. This parameter indicates the temperature in Celsius that the user wants to convert in Farenheit. The output of the workflow is provided with the tool output message.
External resources
No links have been added yet
Tags
No tags have been set yet
Temperature Converter
This tool takes an integer parameter as input. This parameter indicates the temperature in Celsius that the user wants to convert in Farenheit. The output of the workflow is provided with the tool output message.
Parameters
Configuration nodes: the values that can be set by the agent.
Double Configuration
Parameters
Values that can be set by the agent
ge Output
for the calling agent.
Message Output
Input data
Zero, one or more input data tables
Workflow Input
Output data
Zero, one or more output data tables
Workflow Output

Data Input


Execute all
Cancel all
Reset all
Local – Tool
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No links have been added yet
Tags
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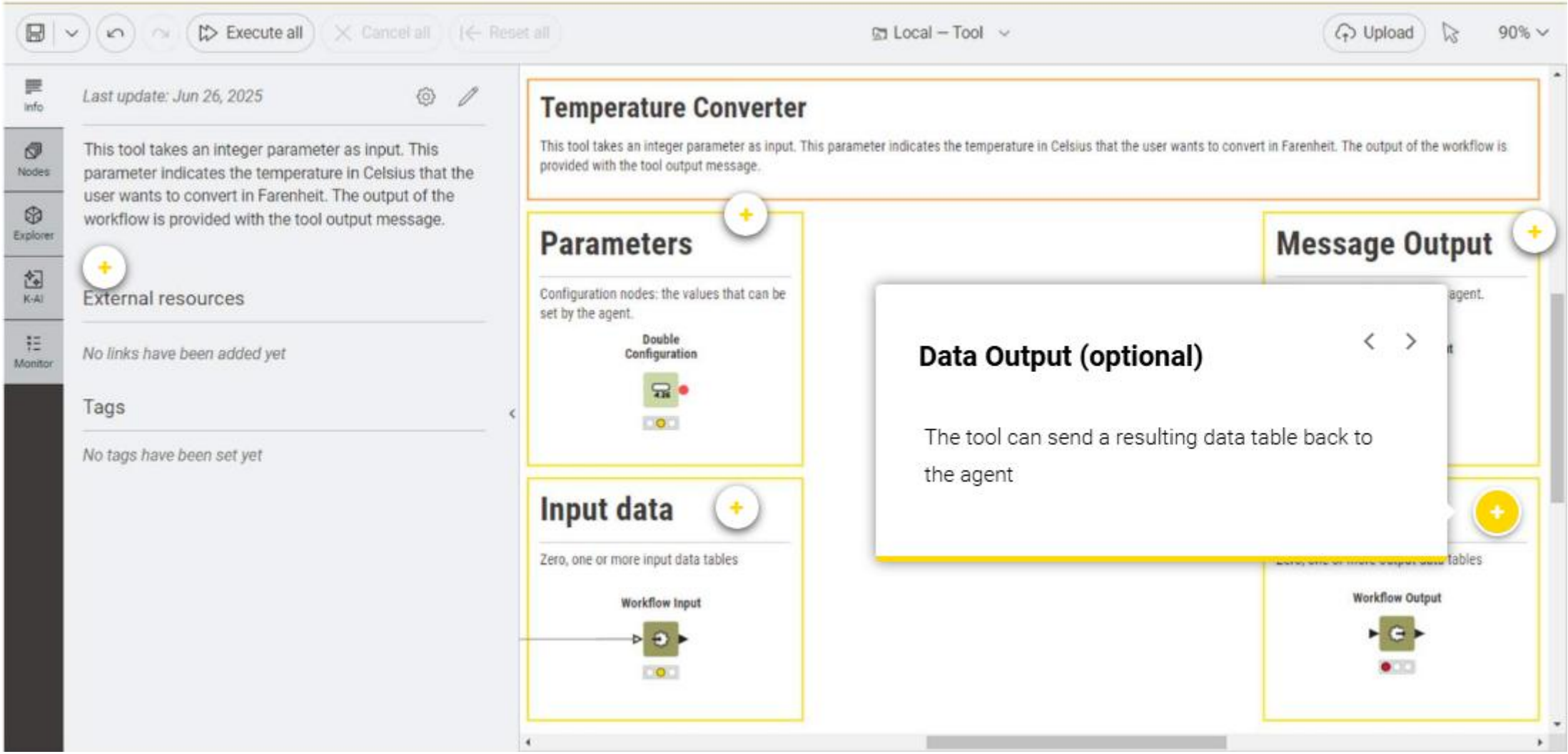
This tool takes an integer parameter as input. This parameter indicates the temperature in Celsius that the user wants to convert in Farenheit. The output of the workflow is provided with the tool output message.
Parameters
Configuration nodes: the values that can be set by the agent.
Double Configuration
Message Output
String message for the calling agent.
Data Input (optional)
The tool can receive data input from the agent
Input data
Zero, one or more input data tables
Workflow Input
Workflow Output

Data Output


Execute all
Cancel all
Reset all
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info
Nodes
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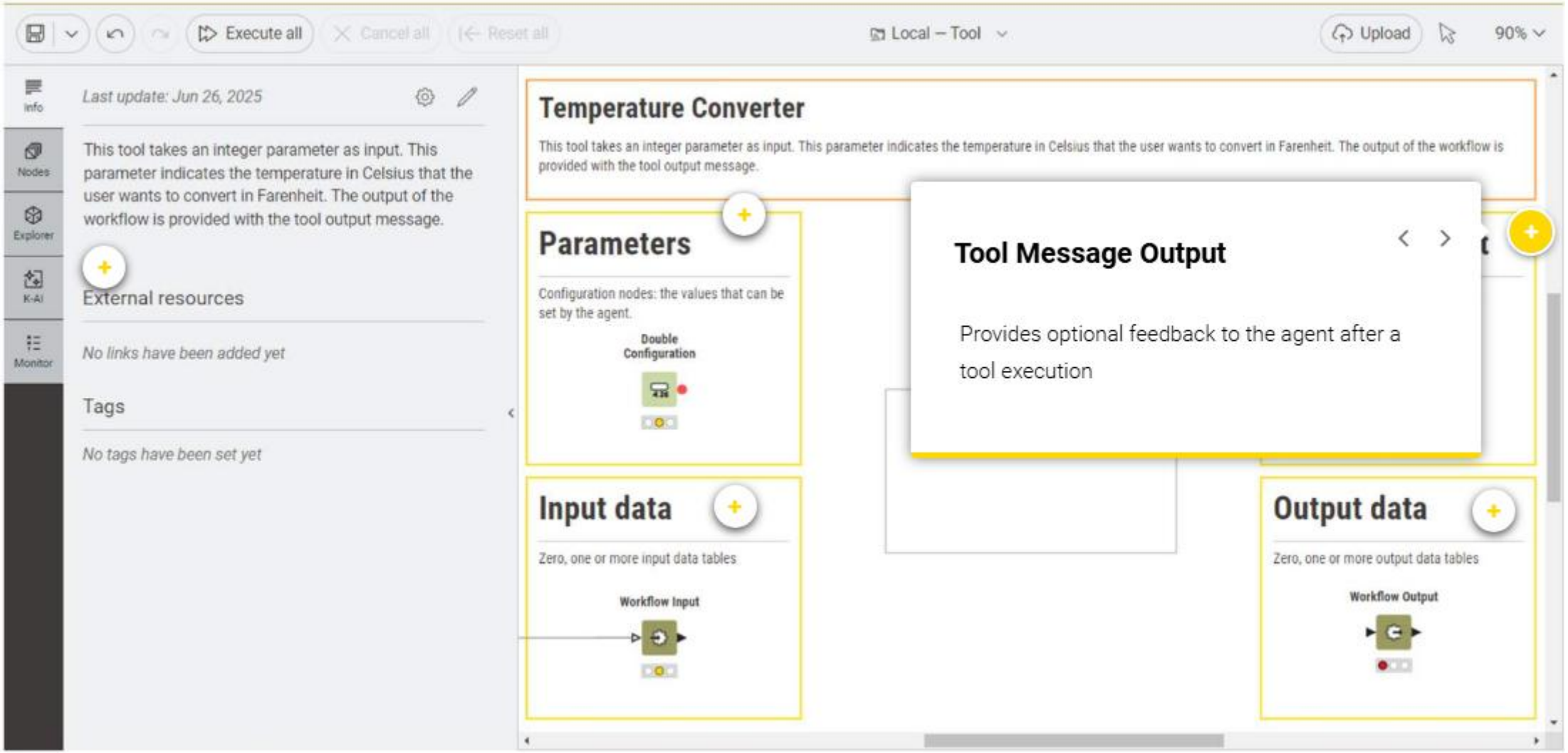
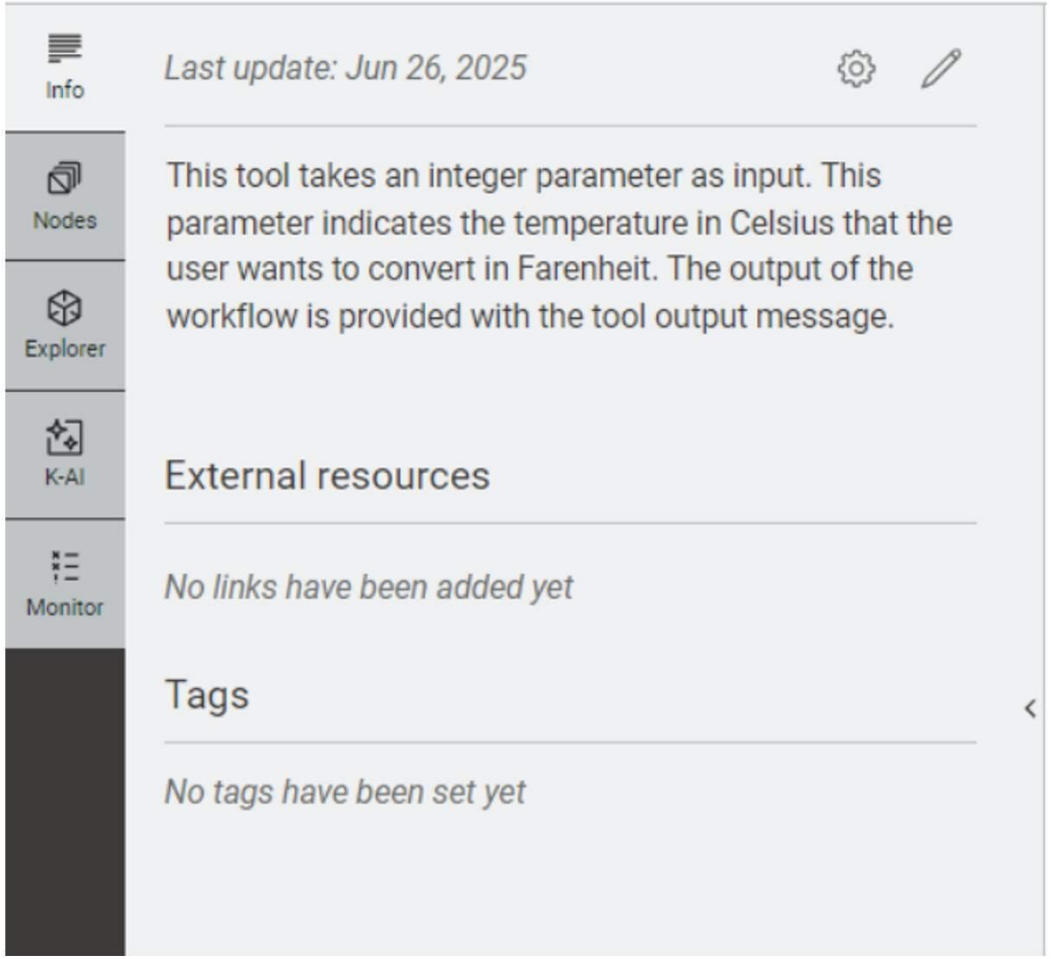
Tags
No tags have been set yet
Temperature Converter
This tool takes an integer parameter as input. This parameter indicates the temperature in Celsius that the user wants to convert in Farenheit. The output of the workflow is provided with the tool output message.
Parameters
Configuration nodes: the values that can be set by the agent.
Double Configuration
Input data
Zero, one or more input data tables
Workflow Input
Message Output
Data Output (optional)
The tool can send a resulting data table back to the agent
Workflow Output

Tool Message Output



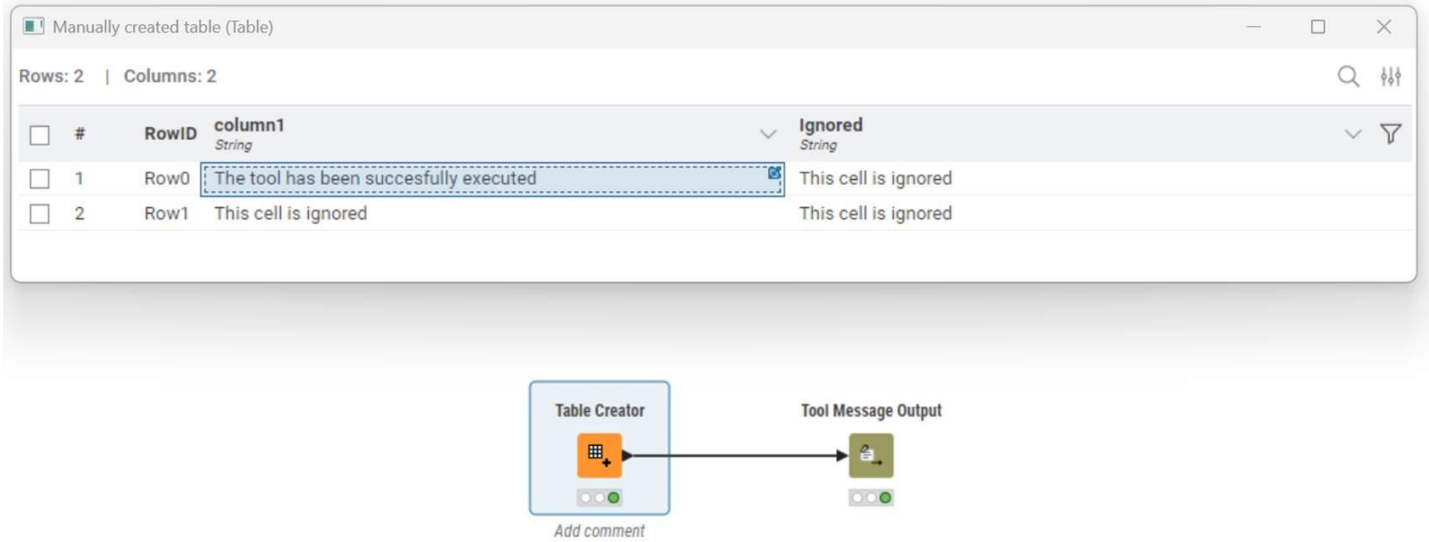
Tool Description

- The tool description explains as precisely as possible what task the tool is able to solve. It is defined in the workflow's Info field.
- The agent reads this description and decides when to use the tool. A well-written description allows the agent to reason effectively about the available options. You can also include some examples of usage, to enhance the description.
- The description should explain:
- The task performed by the tool
- The expected input data
- The output produced
- The configurations required
- The types of question the tool is designed to answer



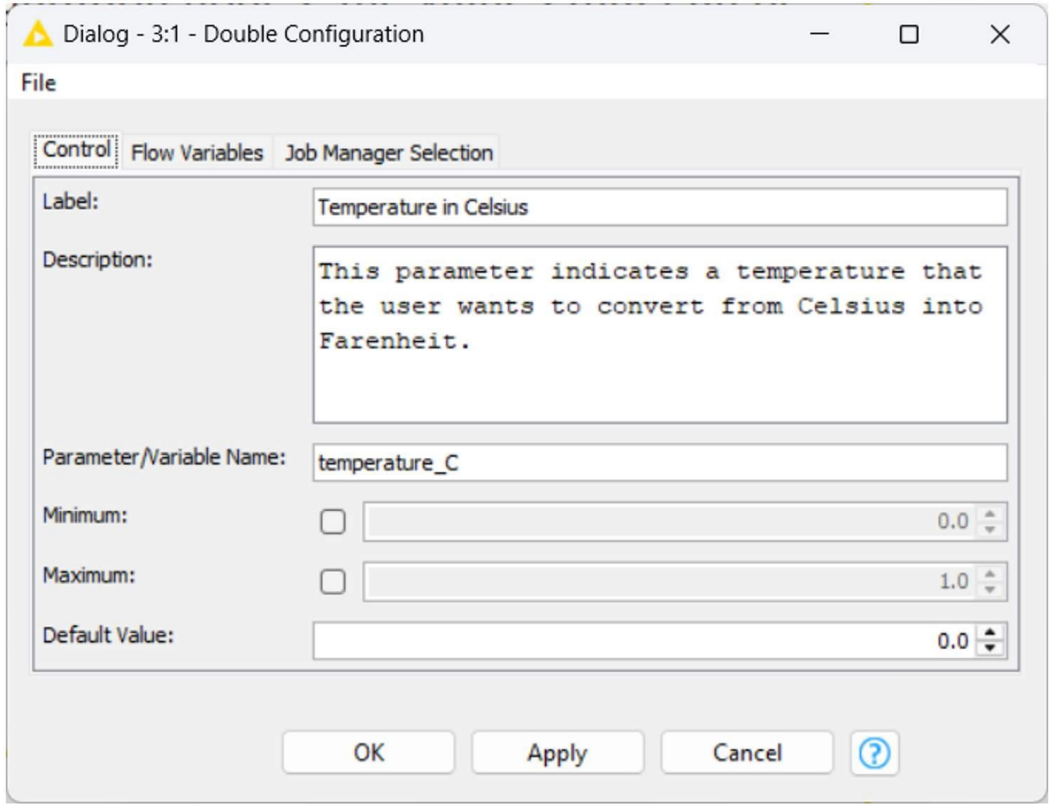
Tool Message Output

- The Tool Message Output node provides optional feedback to the agent after a tool execution.
- Include this node if textual output is needed for the agent to reason with after the tool call, omit it if no output is necessary.
- The node reads the first value from the first cell of its input table. This string becomes the content of the Tool Message returned to the agent. It is useful, for example, to return
  - A summary of the processed data (“The database contains data about 22 customers.”)
  - Short textual insights (“The average temperature is 22,5°C which is equivalent to 72.5°F.”)
  - Confirmation or intermediate results (“The email has been successfully sent to the recipient list.”)



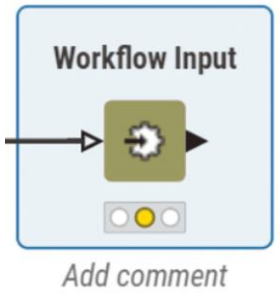
Parameters

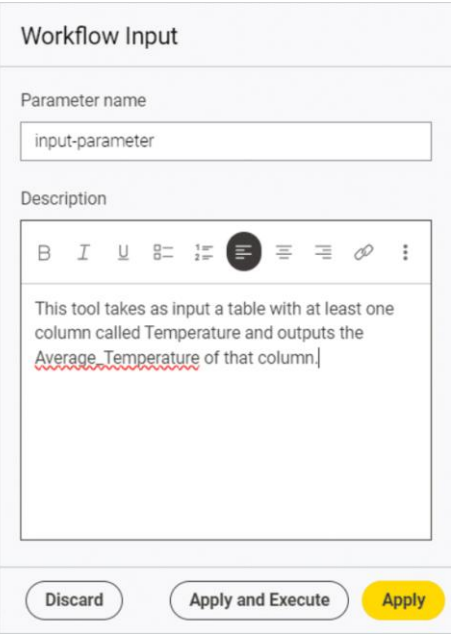
- Parameters are values that can be set by the agent.
- Use Configuration nodes (such as String Configuration or Integer Configuration) to define adjustable parameters.
- For each parameter:
  - Provide a clear parameter name used as the variable name
  - Write a concise description explaining its purpose. The agent reads these definitions to determine which parameter values to set during tool execution

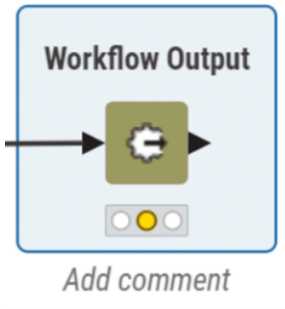


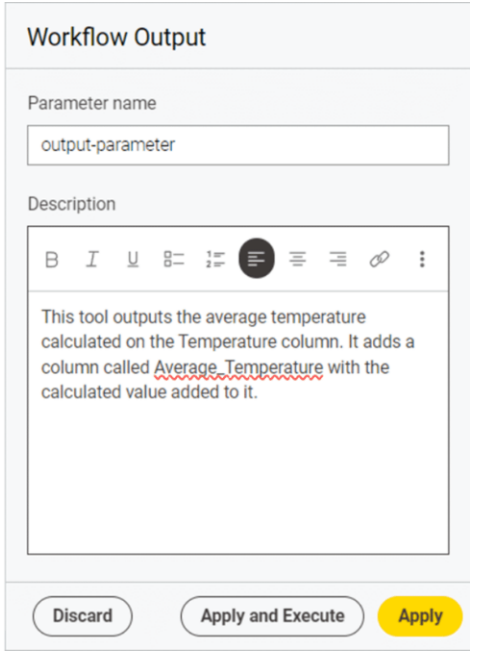
Data Input & Data Output (optional)

- Tools can optionally take input data or send a data output or both.
- Use the Workflow Input node to define the incoming data structure and the Workflow Output node to specify the result table the tool produces.
- The agent does not access raw data directly but can trigger tools that process and summarize data as needed.







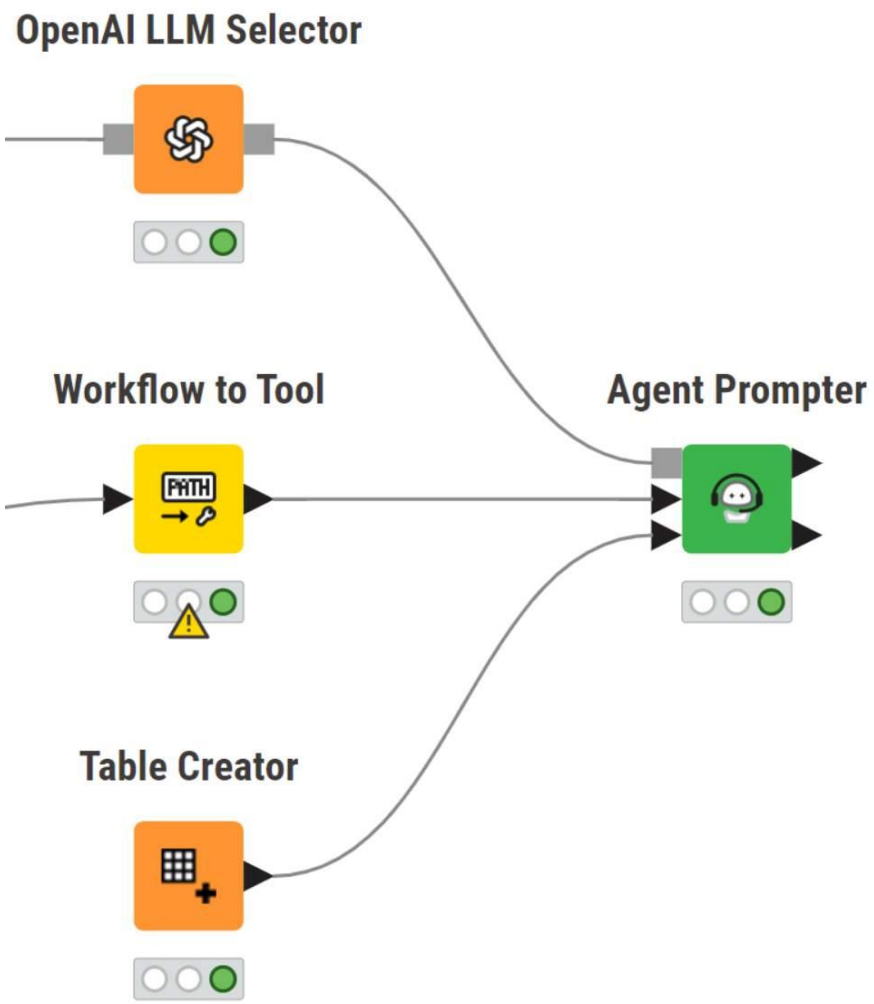


How Agents Work

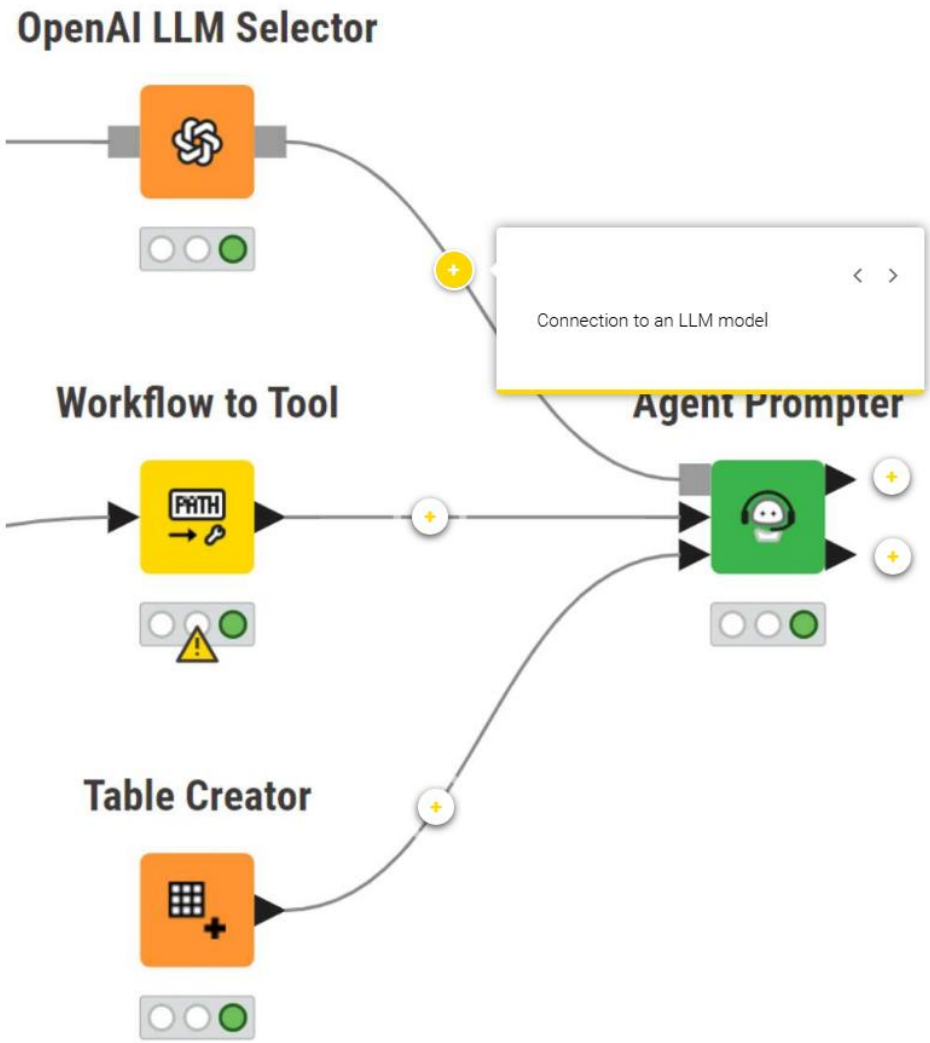
- AI Agents work by a series of reasoning loop executions.
- In a way, agents are performing trials and errors until the required task is completed.
- Here are the steps in agents' execution:
  - The agent thinks about the task.
  - Chooses whether to call a tool.
  - Evaluates the result produced by the tool.
  - Decides if further steps are needed.
  - Continues until the task is completed.

Agent Prompter

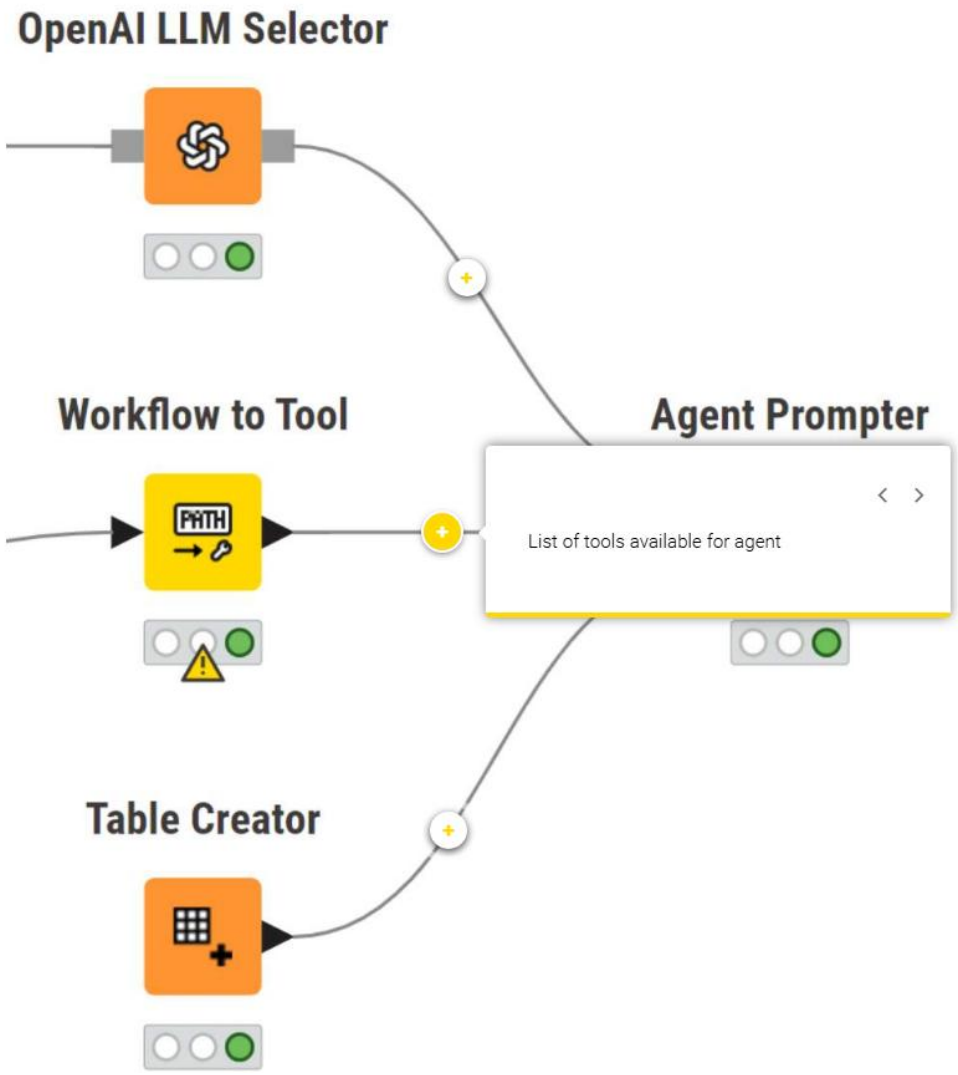
- In KNIME Analytics Platform, an AI agent is implemented by the Agent Prompter node, executing the loop described above.
- Here are the input and output ports of the Agent Prompter node.



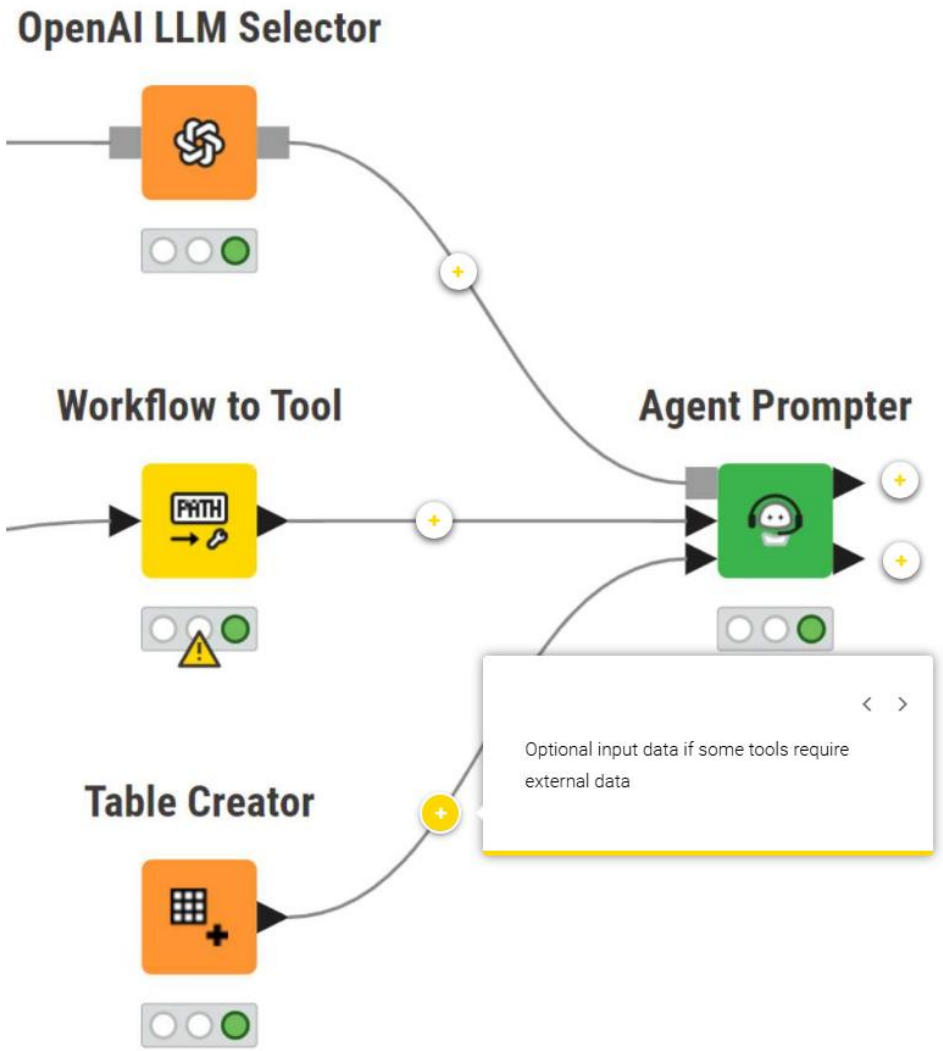
Connection to an LLM



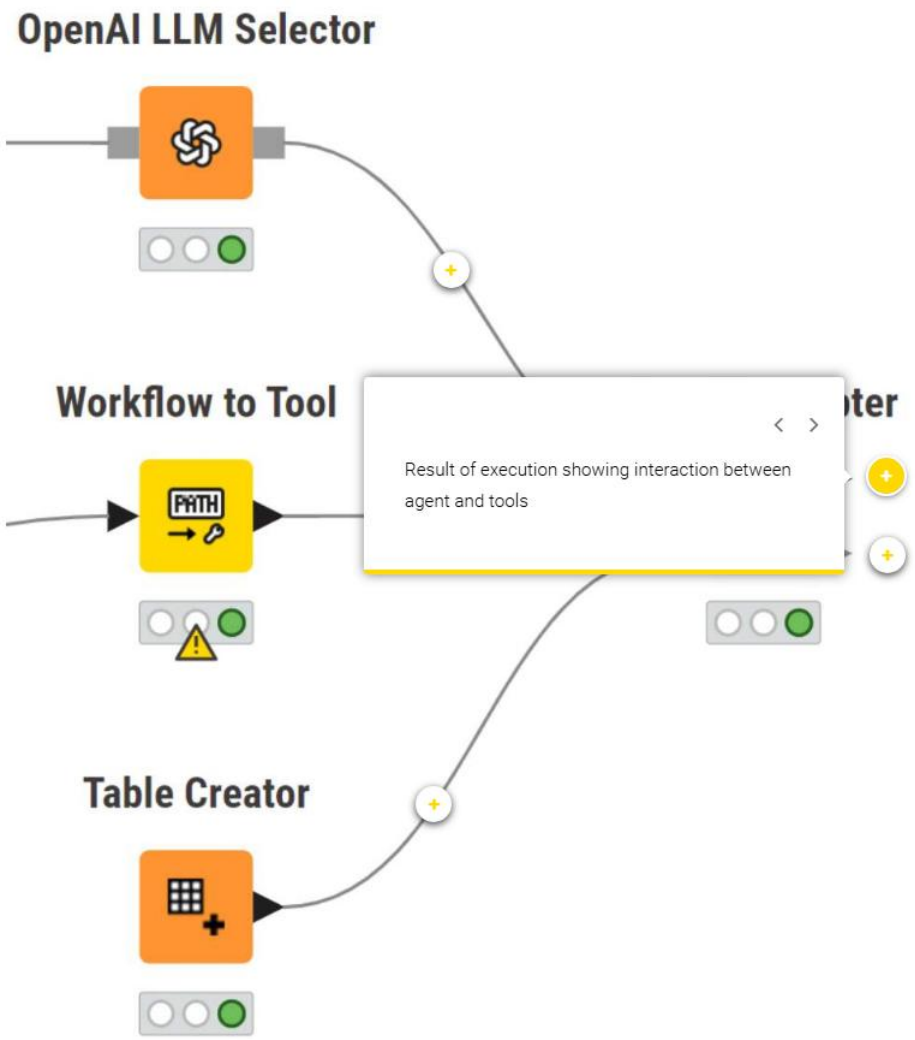
List of tools available to the agent



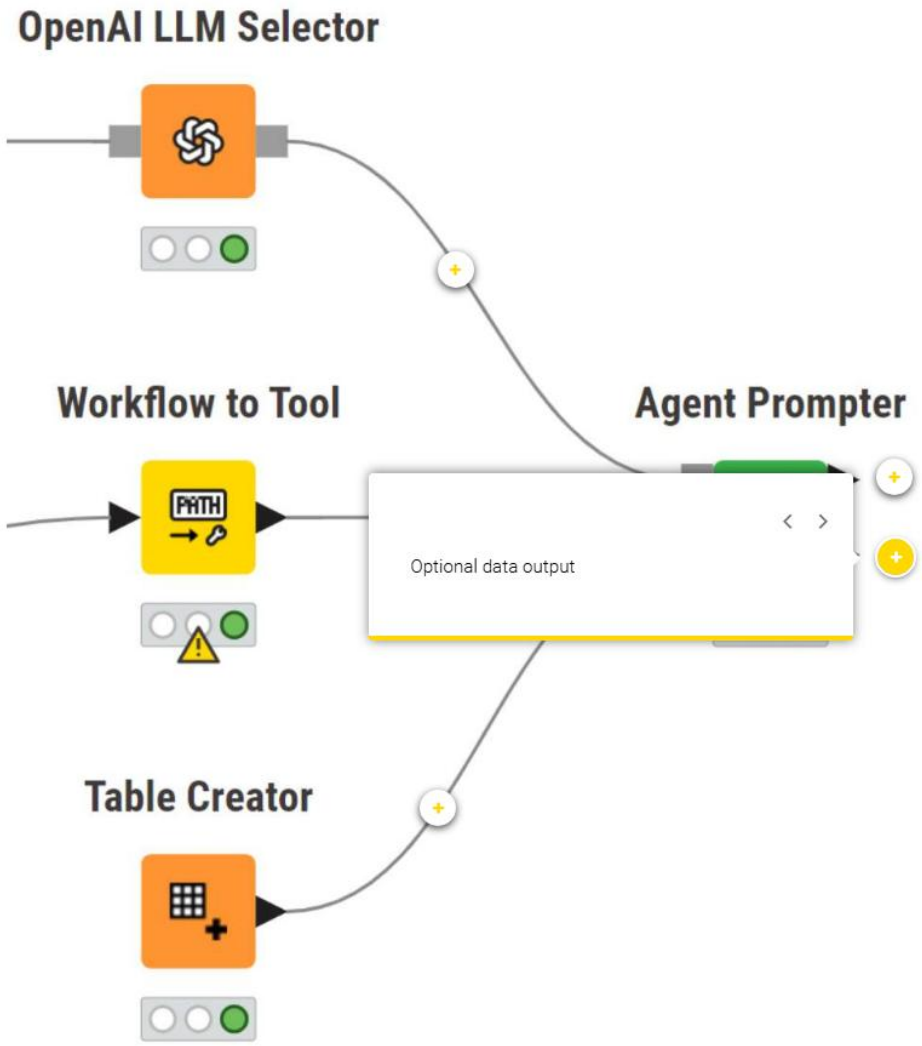
Optional input data



Result of execution

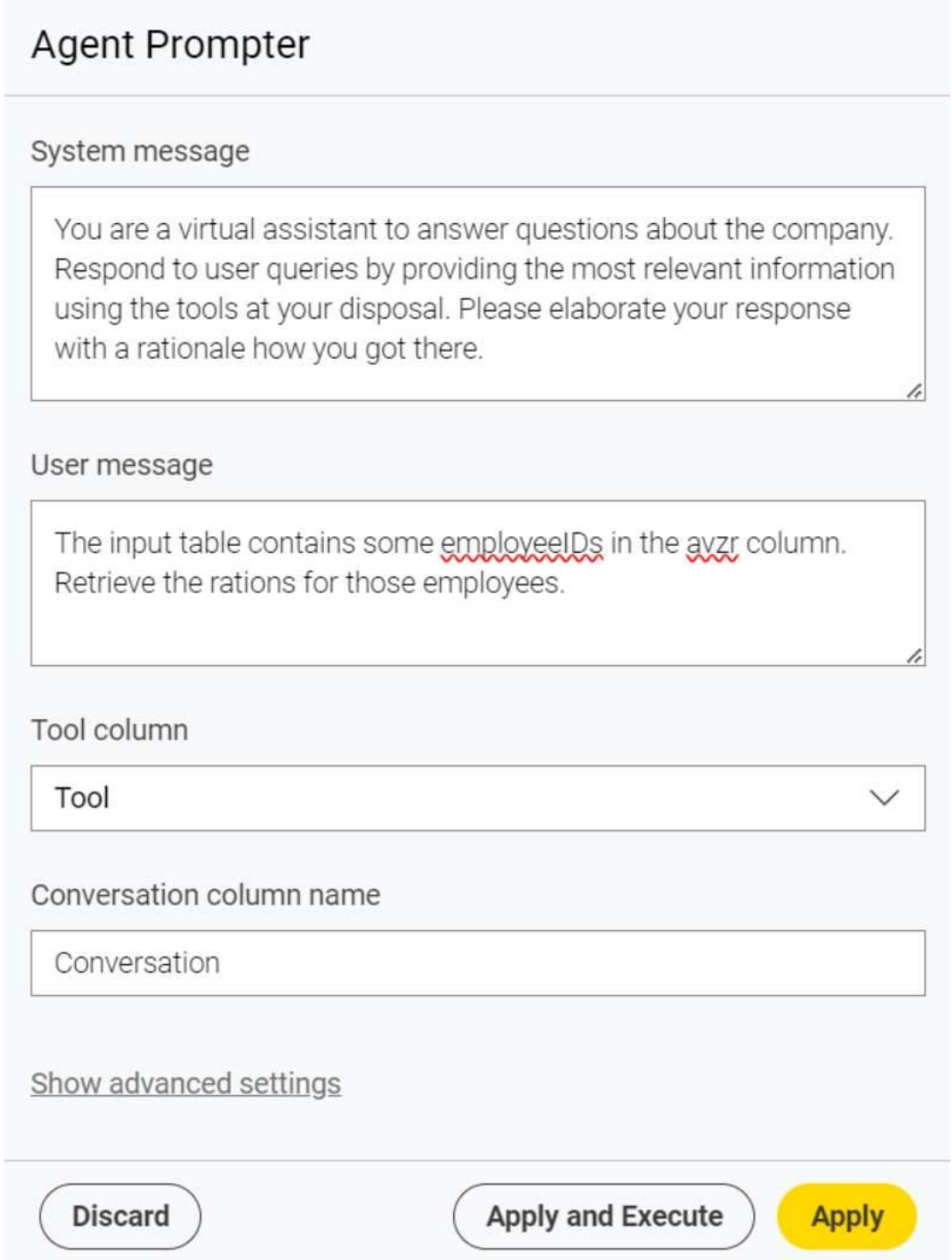


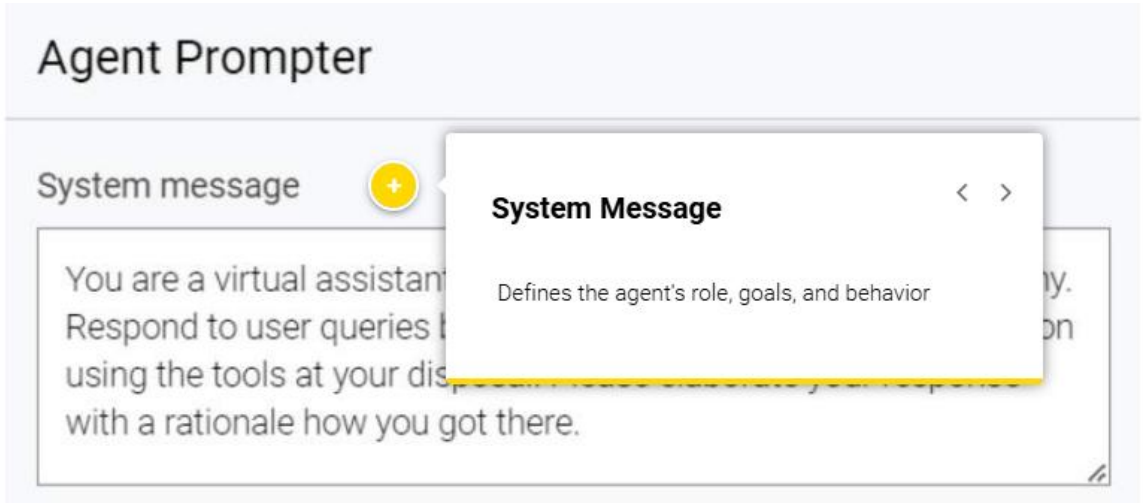
Optional data output

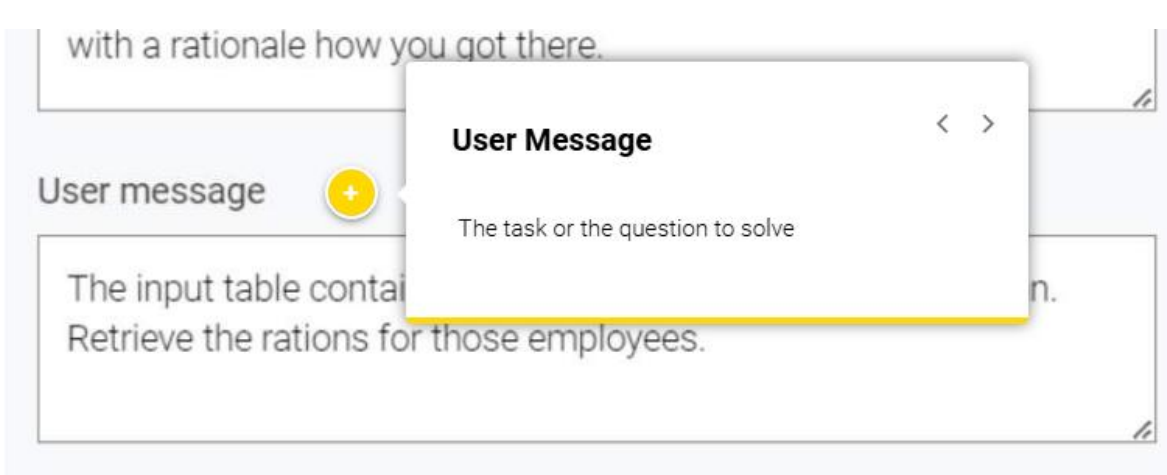


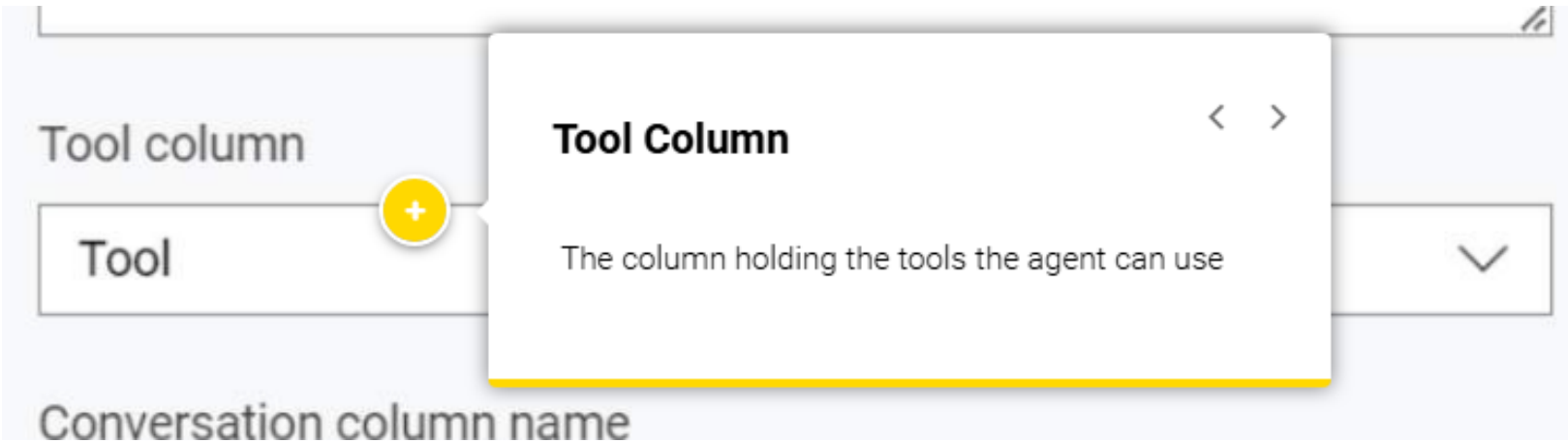
Configuration Panel

In the configuration panel, we supply the information necessary to execute the Agent Prompter node



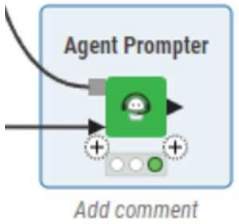

Agent Prompter
System message
You are a virtual assistant
Respond to user queries
using the tools at your dis
with a rationale how you got there.
System Message
Defines the agent's role, goals, and behavior

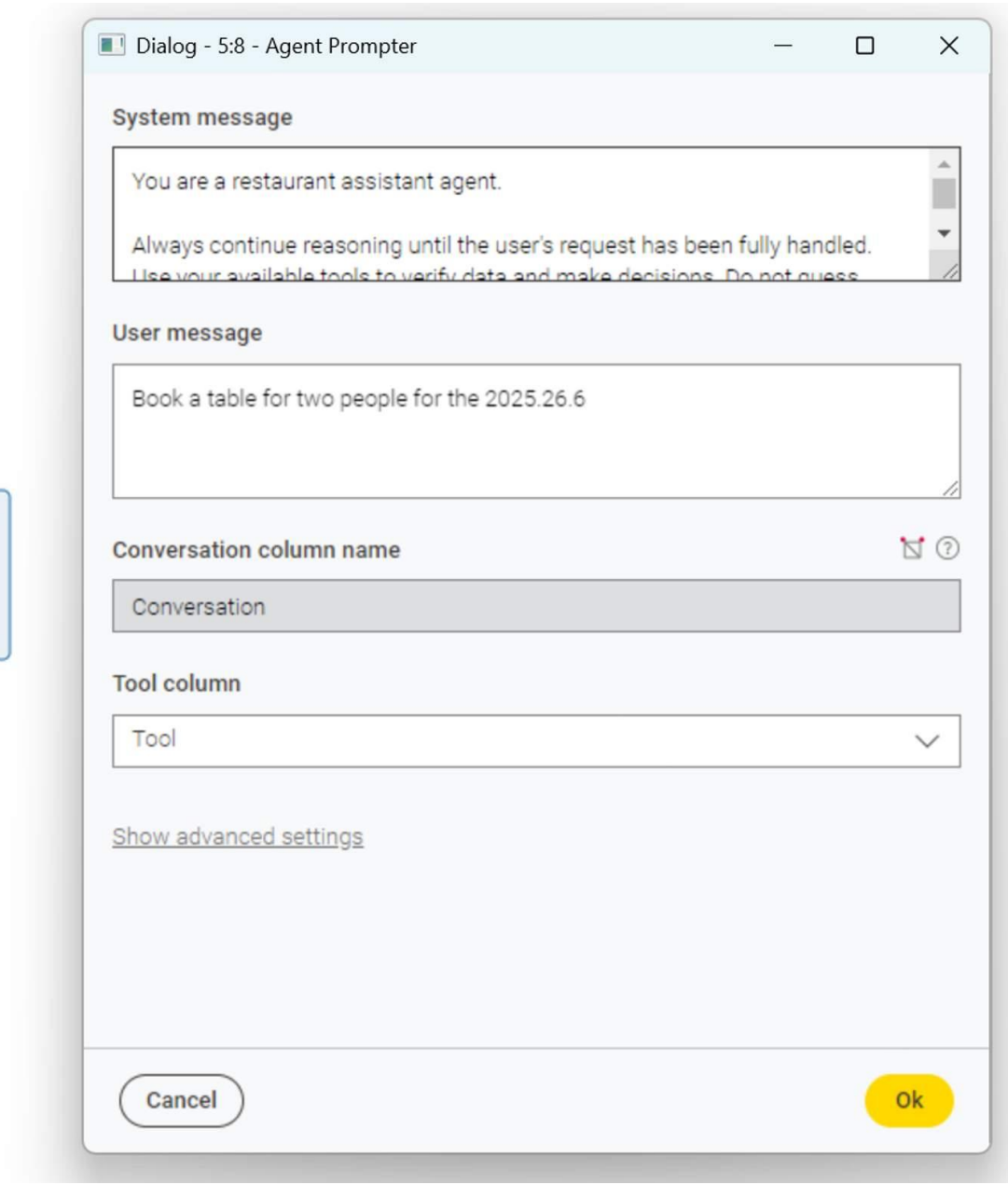

with a rationale how you got there.
User message
The input table contai
Retrieve the rations for those employees.
User Message
The task or the question to solve


Tool column
Tool
Conversation column name
Tool Column
The column holding the tools the agent can use

Example

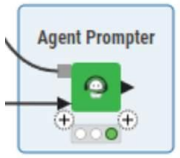
- Here is an example of the Agent Prompter node in action.
- The user asks to book a table at a restaurant.





Example

The Agent Prompter then outputs the conversation between the user, the agent, and the tool.



Conversation (Table)

Rows: 5 | Columns: 1

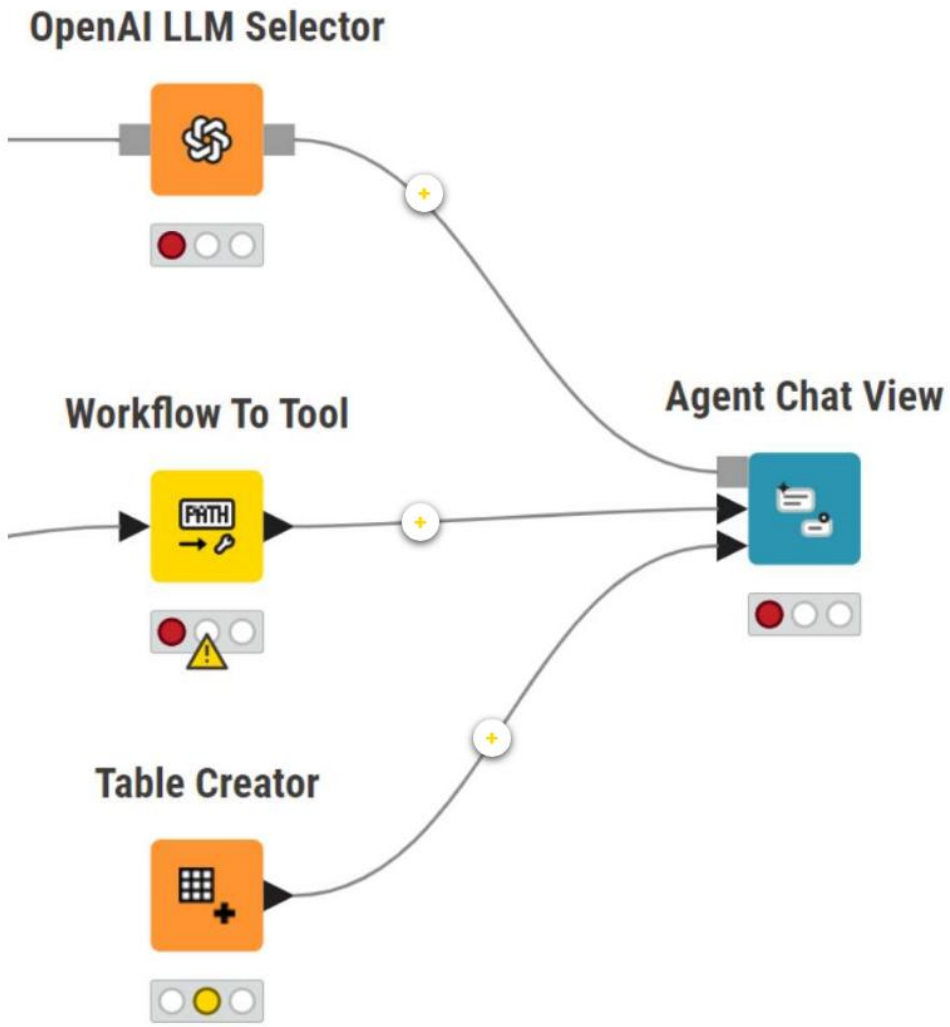
#	RowID	Conversation *Message*
1	Row0	User **Data Tools Interface** You have access to tools that can consume and produce data. The interaction with these tools is mediated via a data repository that keeps track of all available data items. The repository is represented as a map from IDs to data items
2	Row1	User Book a table for two people for the 2025.26.6

3	Row2	AI
		table_availabilty
		`configuration:`
		`  booking_date-2: "2025-06-26T00:00:00+02:00[Europe/Berlin]"`
		`  number_people-4: 2`

4	Row3	table_availabilty The booking for table T1 with 2 people, on 2025-06-26 was confirmed!
5	Row4	AI The table for two people has been successfully booked for June 26, 2025.

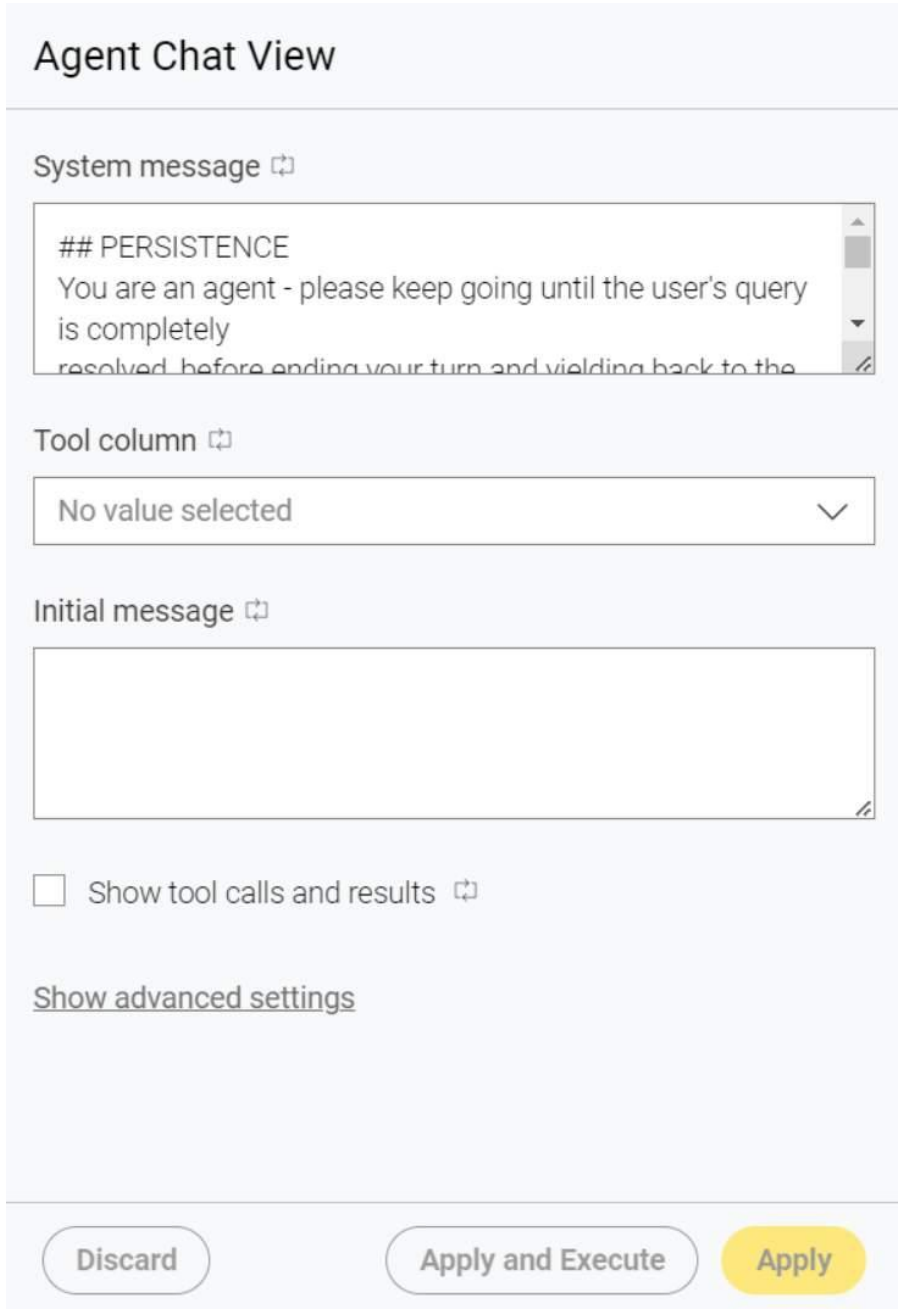
Example

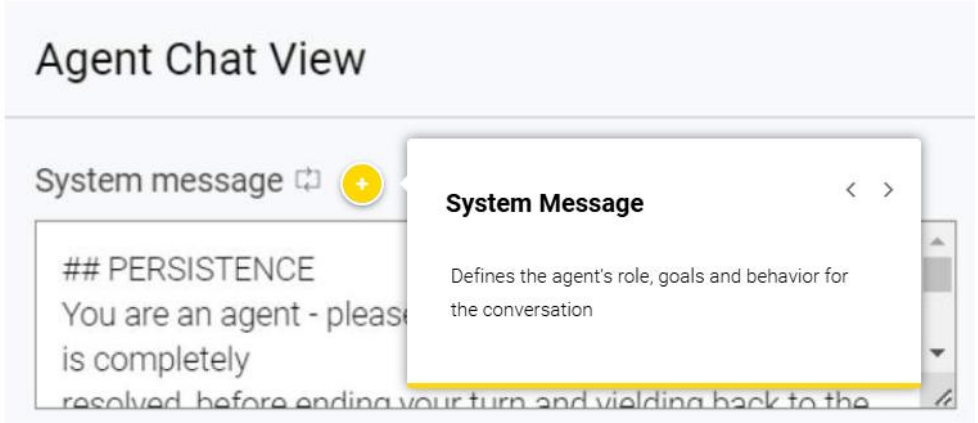
While the Agent Prompter node takes a single prompt and returns the result, the Agent Chat View node provides an interactive chat interface for live agent conversations.

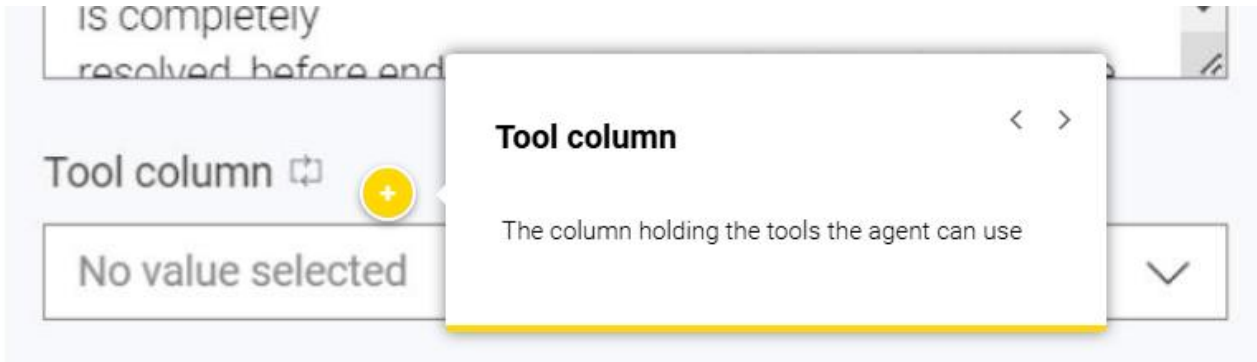


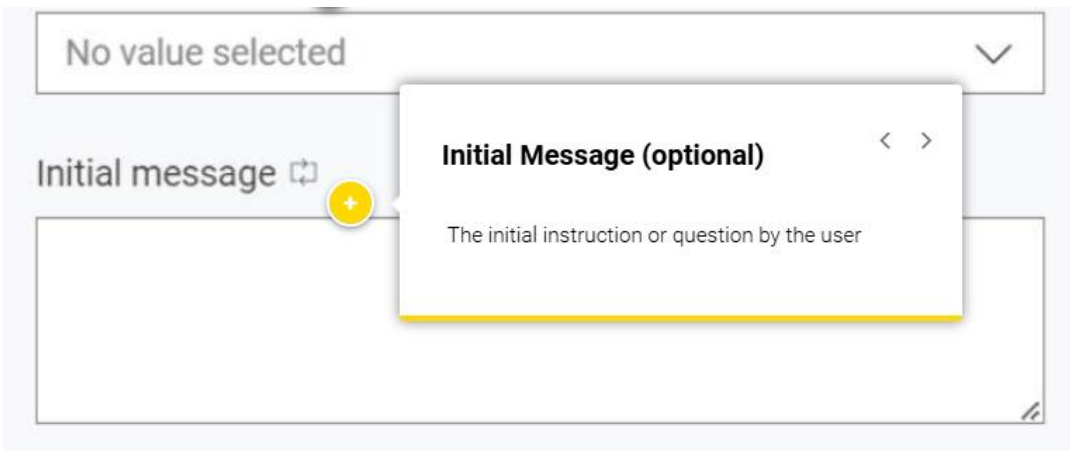
Example

You supply the information necessary to execute the Agent Chat View node in the configuration panel.



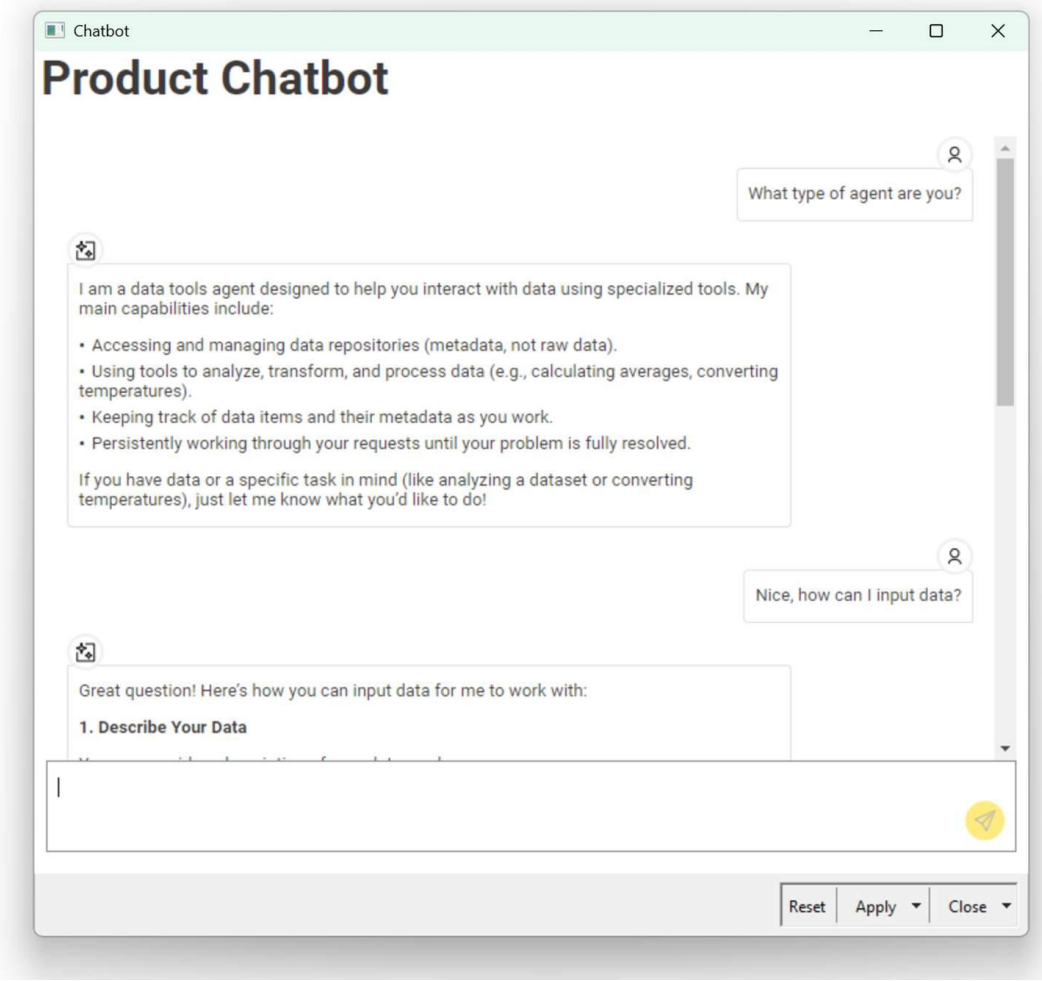

Agent Chat View
System message
System Message
Defines the agent's role, goals and behavior for the conversation
PERSISTENCE
You are an agent - please
is completely
resolved, before ending your turn and yielding back to the


is completely
Tool column
Tool column
The column holding the tools the agent can use
No value selected


No value selected
Initial message
Initial Message (optional)
The initial instruction or question by the user

Example

- During execution, the node opens a chat interface where additional user inputs can be provided interactively.
- The agent reasons, selects tools, processes results, and generates responses in real time.
- This node can be embedded inside a component, allowing it to be deployed and shared via KNIME Business Hub, making the agent available as an interactive application to end users.

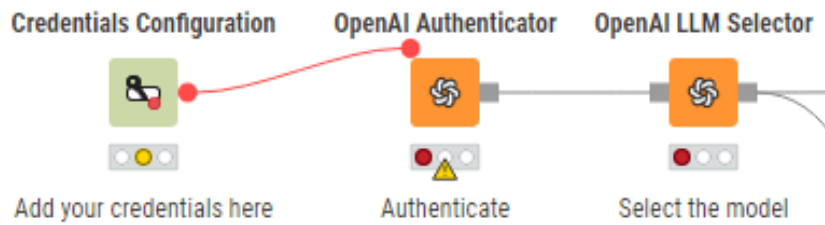


01 Simple Agent

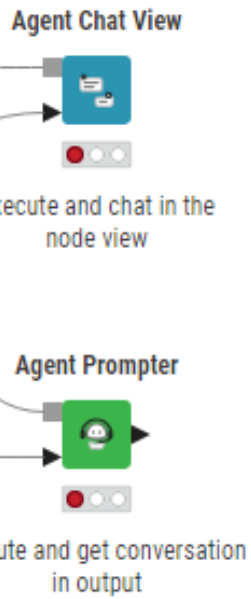
This workflow demonstrates how to create an agent that is able to analyze product feedback and generate discount codes using two tools. Two solutions are showed:

- The **Agent Chat View** creates an interactive view where you can directly prompt the agent.
- The **Agent Prompter** prompts the agent with one user question and produces the conversation in output.

Set up the **OpenAI API key**, authenticate, and **select** the LLM



List the tools in the ***Tools-message*** folder



Questions for the agent

The LLM behind the agent is able to reply to generic questions. For example, try

- *How do you count to 10 in Dutch?*
- *What is the currency used in Switzerland?*

The tools are able to perform some specific operations on user feedback. For example

- *Generate a discount code for the product mentioned in the following user feedback: "I loved the LK-887 vacuum cleaner!"*

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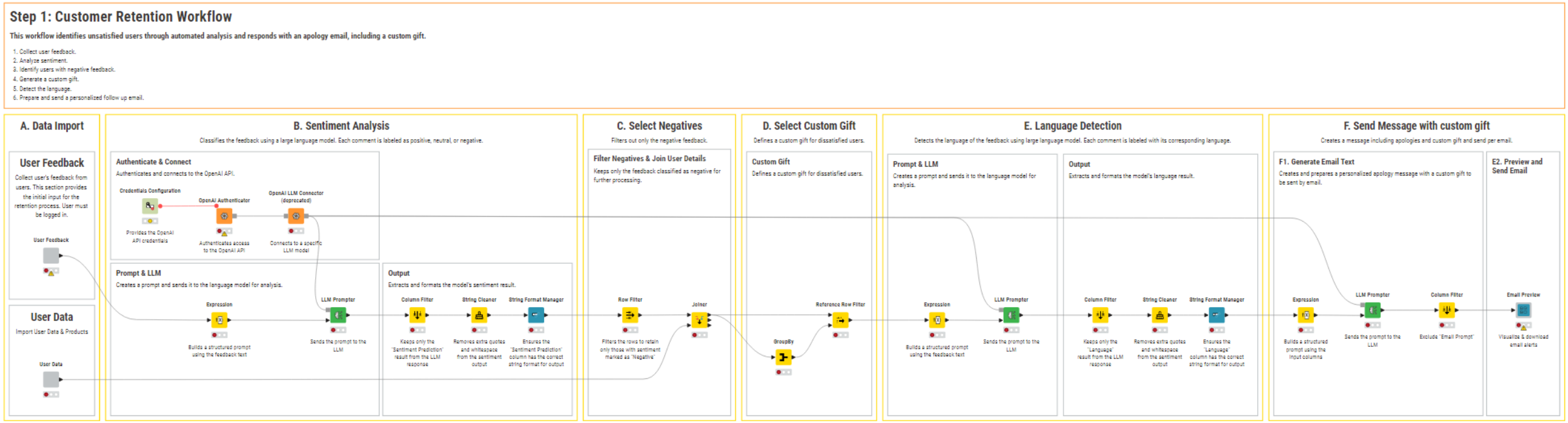

https://www.knime.com/blog/build-an-ai-agent-in-4-steps

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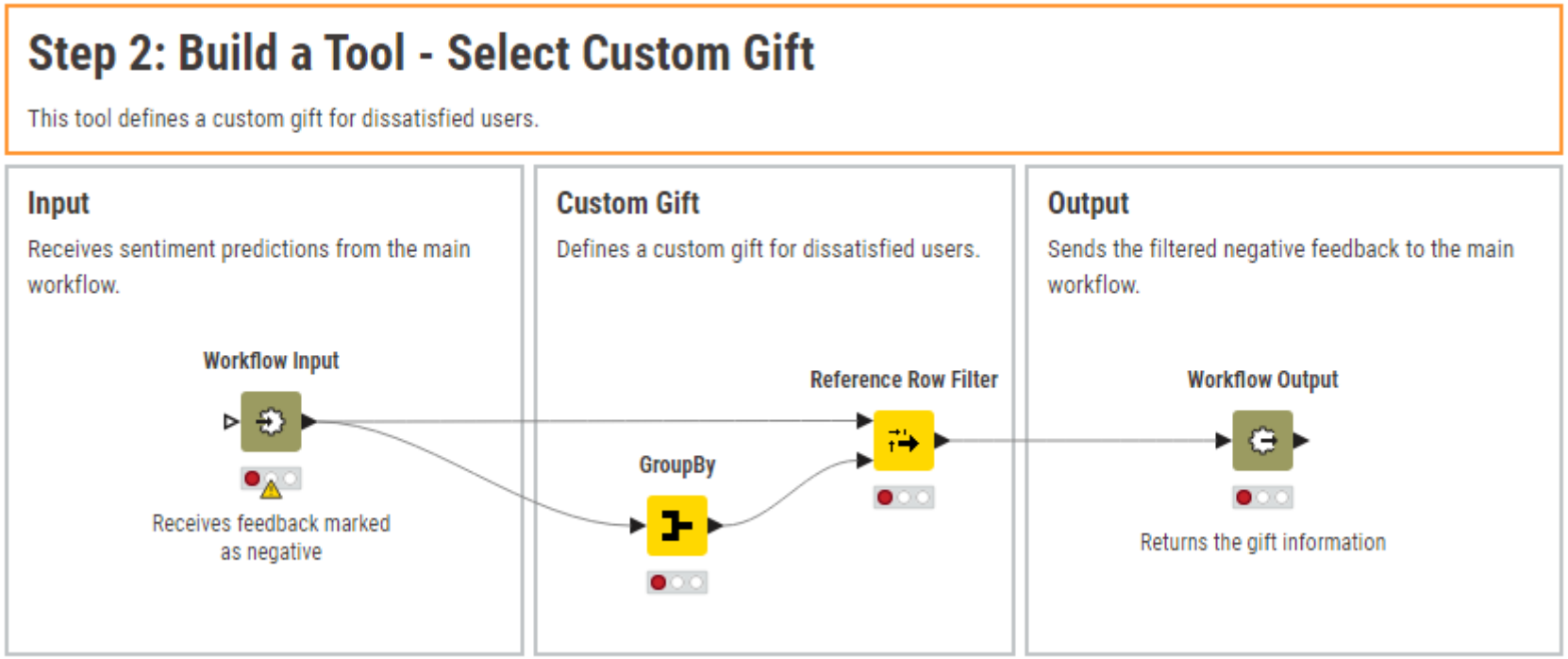

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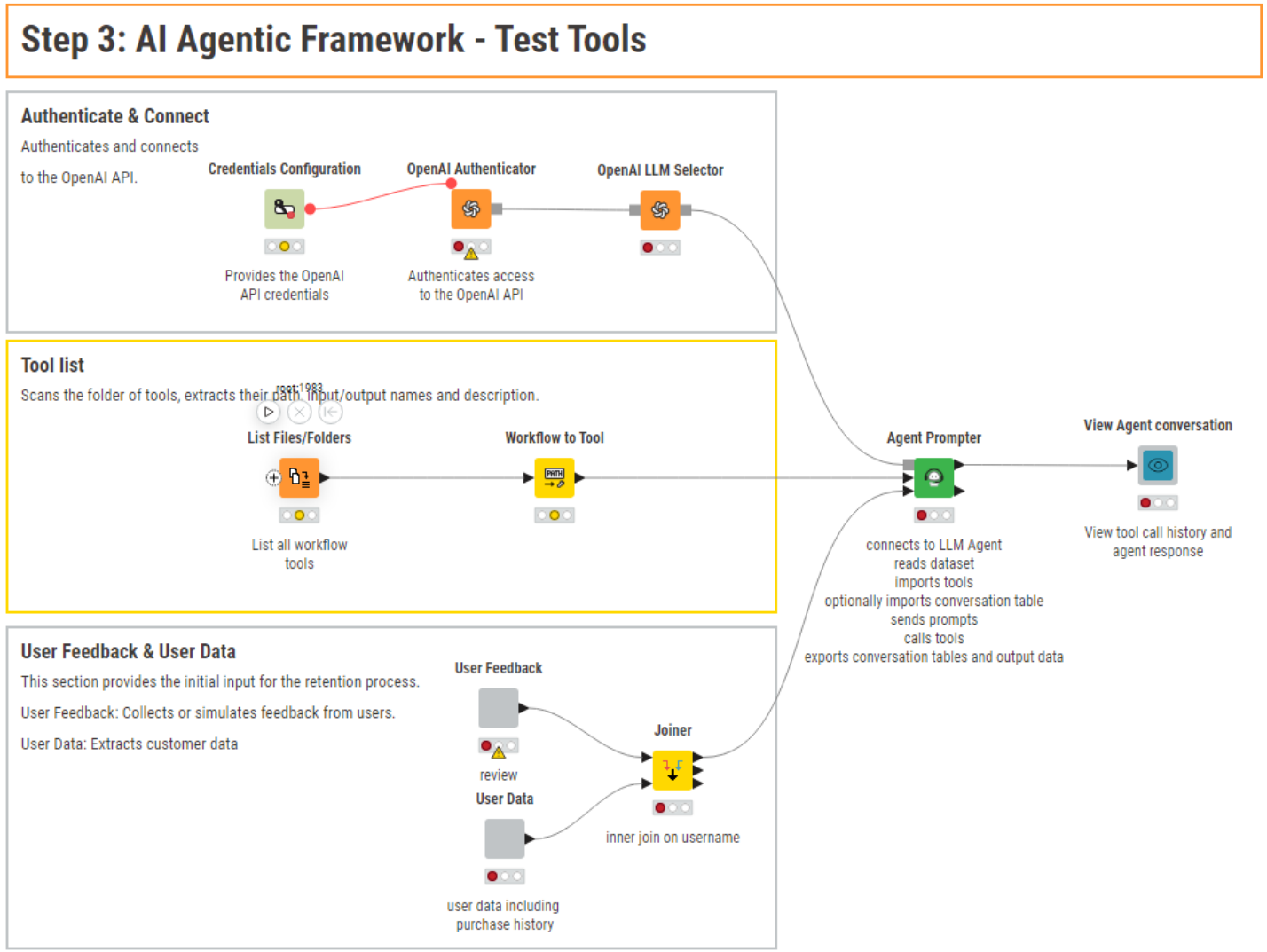

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