

AI Agent Workflow

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1. Course Content

- Build intelligent agent workflows using multiple large AI models to implement complex logical functions.
- Please note that DOFBOT-PRO uses Dify, which is a chatbot platform. This tutorial is provided for users who are interested in learning about and developing with this platform.

2. Start the Dify Service

- Connect to the car's infotainment system via VNC or SSH. Enter the following command in the terminal:

```
sh ~/bringup_dify.sh
```

```

ROS_DOMAIN_ID: 62 | ROS: humble
my_robot_type: M1 | my_lidar: c1 | my_camera: usb
-----
jetson@yahboom:~$ sh ~/bringup_dify.sh
WARN[0000] The "DB_USERNAME" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_DATABASE" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_PASSWORD" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_PASSWORD" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_DATABASE" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_USERNAME" variable is not set. Defaulting to a blank string.
WARN[0000] The "CERTBOT_EMAIL" variable is not set. Defaulting to a blank string
.
WARN[0000] The "CERTBOT_DOMAIN" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_DATABASE" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_PASSWORD" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_USERNAME" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_USERNAME" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_DATABASE" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_PASSWORD" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_DATABASE" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_PASSWORD" variable is not set. Defaulting to a blank string.
WARN[0000] The "DB_USERNAME" variable is not set. Defaulting to a blank string.
[+] Running 10/10
✓ Container docker-sandbox-1      Runni...          0.0s
✓ Container docker-web-1          Running           0.0s
✓ Container docker-ssrf_proxy-1   Ru...            0.0s
✓ Container docker-db-1          Healthy          0.5s
✓ Container docker-redis-1       Running           0.0s
✓ Container docker-worker_beat-1  R...             0.0s
✓ Container docker-plugin_daemon-1 Running          0.0s
✓ Container docker-api-1         Running           0.0s
✓ Container docker-worker-1      Runnin...        0.0s
✓ Container docker-nginx-1       Running           0.0s
jetson@yahboom:~$
```

- Check the car's IP address. You can do this through the OLED screen, using `ifconfig`, or directly in the terminal. Enter the car's IP address directly into your browser's address bar to access the Dify management page.

```

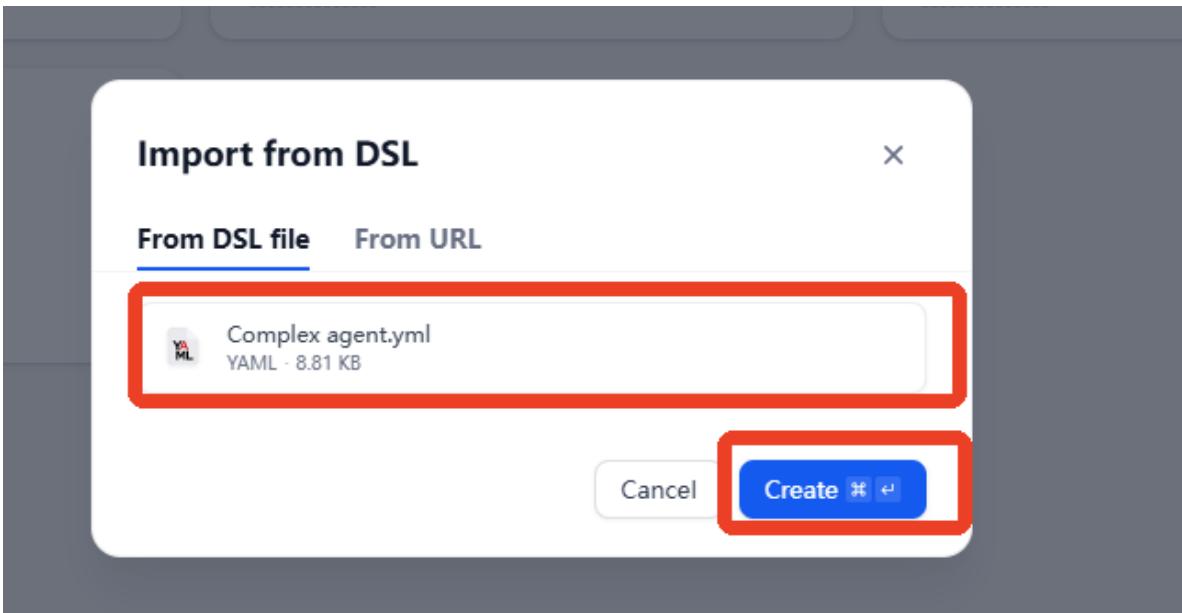
jetson@yahboom: ~
jetson@yahboom: ~ 80x24
[System Information]
-----
IP_Address_1: 192.168.2.49
IP_Address_2: 192.168.12.34
MACHINE: OrinNx | ROS_DISTRO: humble | ROS_DOMAIN_ID: 30
ROBOT_TYPE: ROSMASTER-M3Pro | CAMERA_TYPE: dabai_dcw2 | RADAR: Tmini-plus*2
-----
jetson@yahboom:~$
```

3. Case Study: Categorized Question-Answering Chatbot

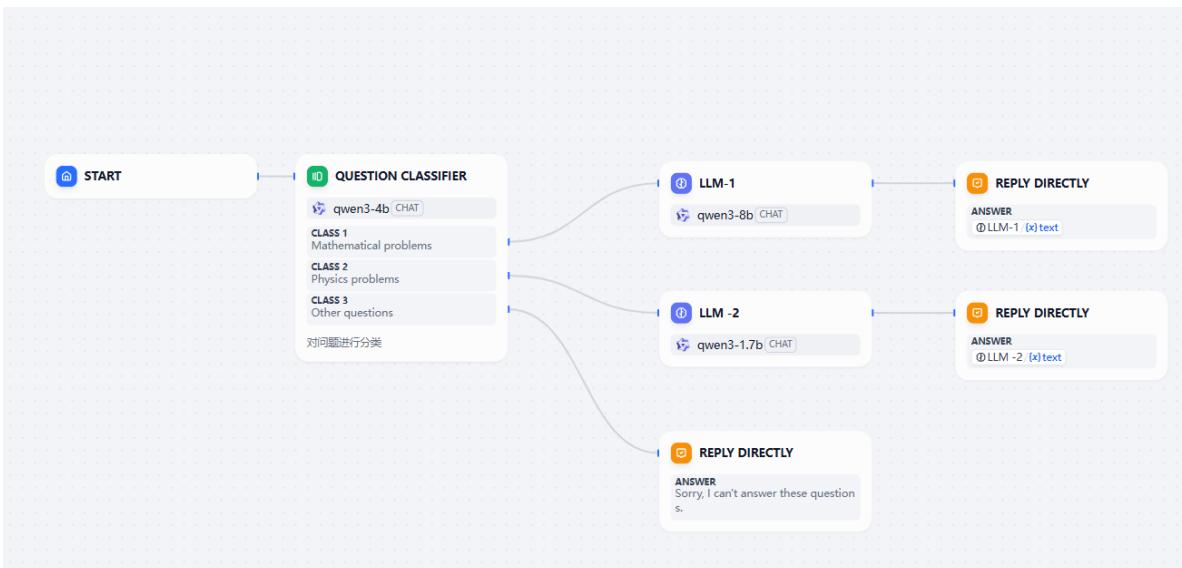
- In the example AI application folder of this lesson, there are reference examples that can be directly imported and used.
- In the Dify homepage studio, click "Import DSL File".

The screenshot shows the Dify Studio interface with the 'Studio' tab selected. In the top left, there's a 'CREATE APP' section with options like 'Create from Blank' and 'Import DSL file' (which is highlighted with a red box). Below this are several cards representing different AI applications, such as 'RAG knowledge base + chatbot', 'Chatbot', 'yahboom-usb_en', 'yahboom-nuwa_en', and 'yahboom-nuwa'. Each card has an 'ADD TAGS' button.

- Select the example AI application `Complex agent.yml` in the course folder for this section, and then click "Create".



- You can see the workflow content as shown below.



- In the workflow, `Question classifier` is a module driven by a large AI model. Its function is to categorize user questions into math questions, physics questions, and other questions. If the user's input matches a math or physics-related question, it will invoke the corresponding branch of the large AI model to answer it. The categories in `Question classifier` are as follows:



Question Classifier



对问题进行分类

SETTINGS LAST RUN

MODEL *

qwen3-4b CHAT



INPUT VARIABLES *

start / (x) sys.query String

VISION



CLASS *

CLASS 1

21

(x)



Mathematical problems

CLASS 2

16

(x)



Physics problems

CLASS 3

15

(x)



Other questions

+ Add Class

ADVANCED SETTING >

- The LLM-1 branch is used to answer math-related questions. The prompt and settings are shown below.

The screenshot shows the LLM-1 configuration interface. At the top, there's a header with a profile icon, the name "LLM-1", and standard window control buttons. Below the header, there are two tabs: "SETTINGS" (which is selected) and "LAST RUN".

SETTINGS

MODEL *: qwen3-8b (CHAT)

CONTEXT ?: (x) Set variable

SYSTEM ?: 114 (blue star icon) | Jinja (disabled) | (x) (trash bin icon) ↗
你是一个数学大师，能够回答各种数学领域的问题
You are a master of mathematics and can answer
questions in all kinds of mathematical fields

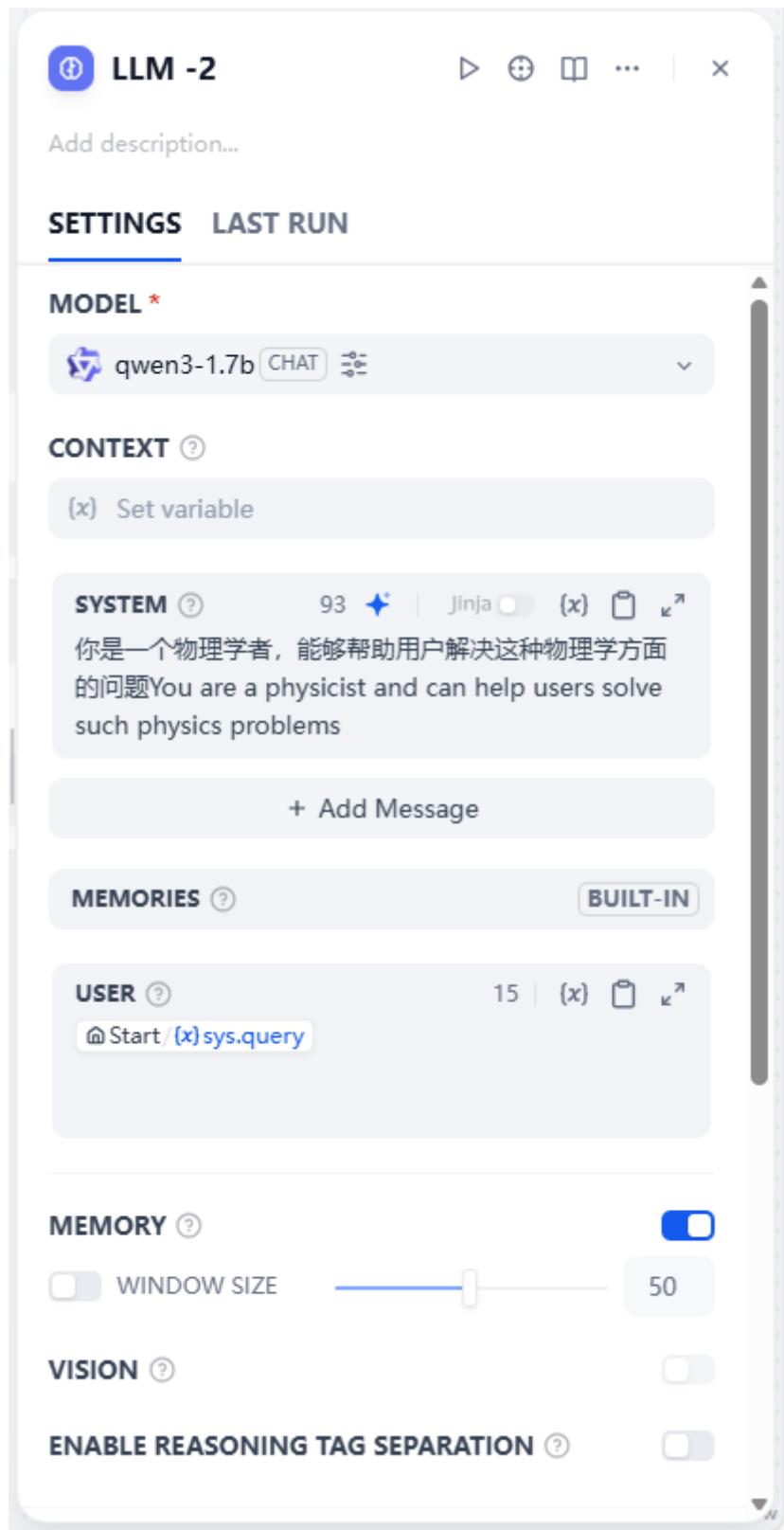
USER ?: 15 | (x) (trash bin icon) ↗
@ Start / (x) sys.query

MEMORY ?: (switch is on)
WINDOW SIZE: slider set to 50

VISION ?: (switch is off)

ENABLE REASONING TAG SEPARATION ?: (switch is off)

- The LLM-2 branch is used to answer physics-related questions. The prompt and settings are shown below.



4. Visualizing and Debugging Workflows

- To debug and test the workflow, click the preview in the upper right corner, and then enter the problem in the pop-up dialog box for testing.

The screenshot shows a workflow preview interface. At the top, there are several buttons: 'X', 'ENV', 'Preview' (which is highlighted with a red box), 'Features', 'Publish', and a refresh icon. Below this is a 'PREVIEW' header with a close button. A large text input field contains the question: "Please briefly describe Einstein's theory of general relativity in no more than 100 words." To the right of this field is a blue user icon. On the left, there is a small circular icon with a robot head. To the right of the question, a section titled "Workflow Process" has a green checkmark and the text "Thought(1.2s)". Below this, a detailed explanation of Einstein's general relativity is provided, mentioning its curvature of spacetime, equivalence principle, and revolutionary unification of gravity with spacetime geometry, predicting phenomena like gravitational waves, black holes, and cosmological expansion. At the bottom, there are navigation arrows and a "Talk to Bot" button with a blue arrow icon.

Please briefly describe Einstein's theory of general relativity in no more than 100 words.

Workflow Process >

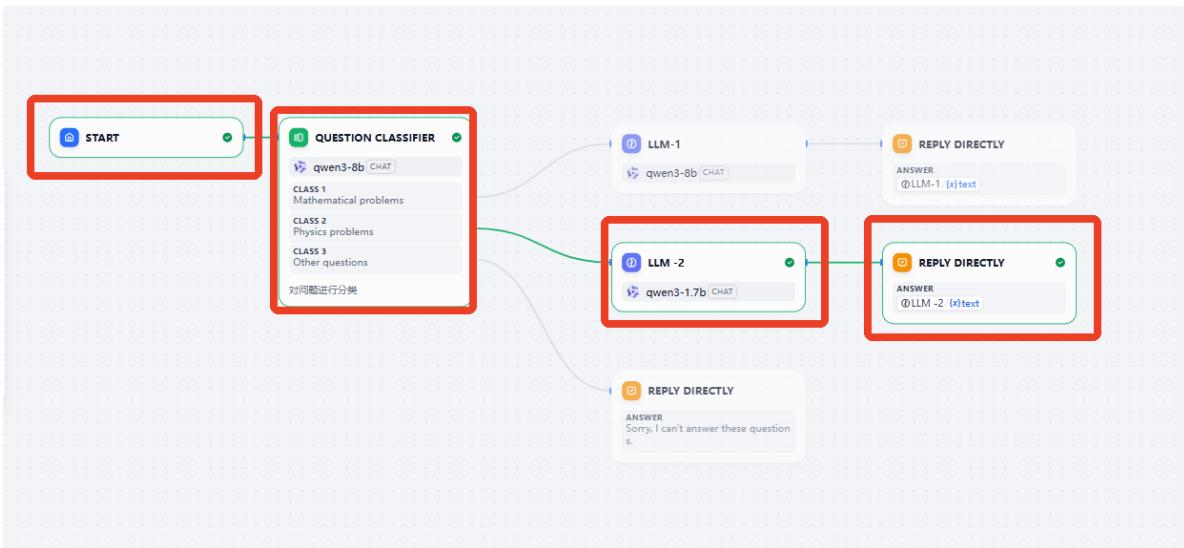
> **Thought(1.2s)**

Einstein's general relativity (GR) describes gravity as the curvature of spacetime caused by mass and energy, mediated by the equivalence principle. Mass distorts spacetime, and this curvature dictates the motion of objects, with light bending around massive bodies. GR revolutionized physics by unifying gravity with spacetime geometry, predicting phenomena like gravitational waves, black holes, and cosmological expansion. It remains foundational for modern astrophysics and cosmology.

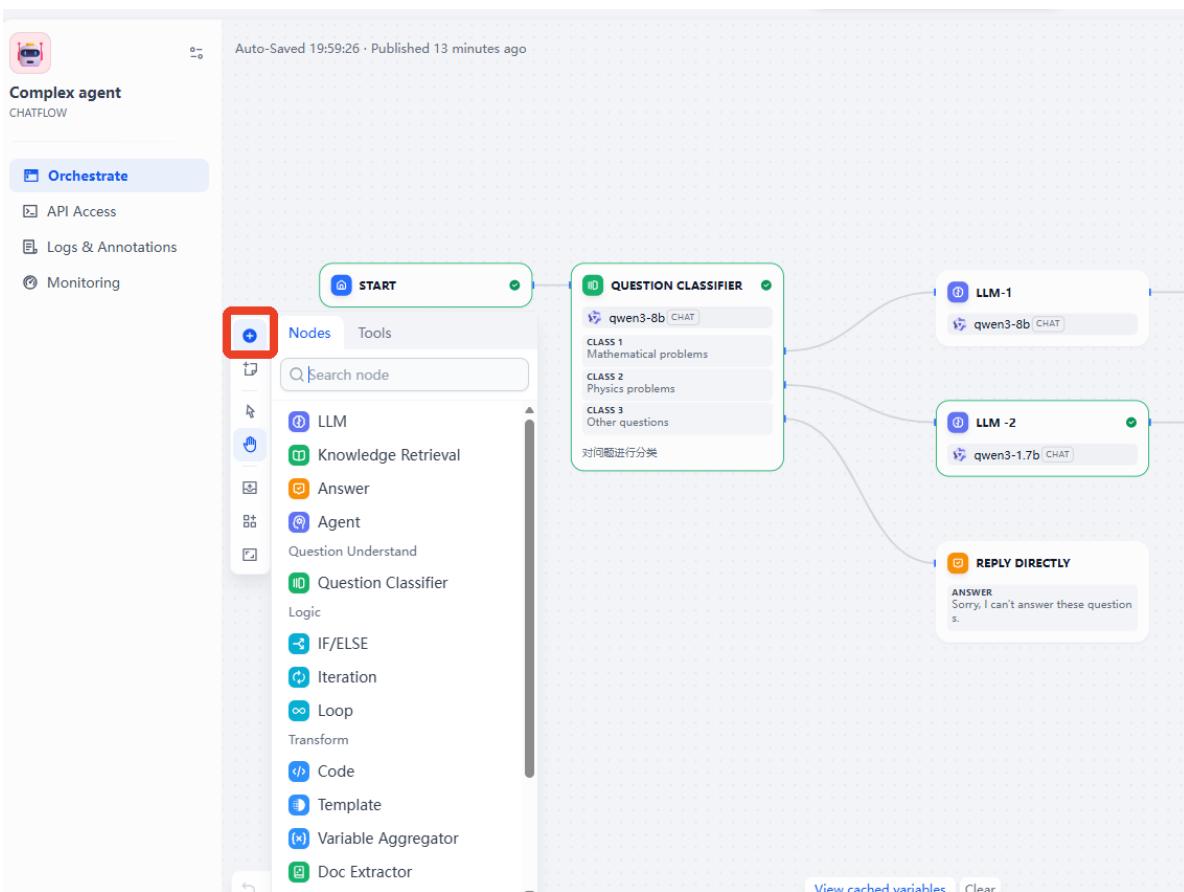
2 / 2

Talk to Bot

- Simultaneously, the workflow will display the branches through which data flows in real time, thus facilitating workflow debugging.



- To expand your workflow, click the "+" sign on the left, which provides access to several pre-defined tools and modules for Dify.



5. Accessing AI Agent Applications

- After orchestrating your AI application, click "Publish Application" to save the configuration. Then, click "Copy URL" or "API Access Credentials" to access the created AI application via the web interface or backend service API.

