1. Introduction

1.1 Product Overview

We have developed an agent-based intelligent shopping system that uses multi-agent collaboration to meet personalized shopping needs. The system includes a human-computer interaction agent and multiple functional agents that automatically break down user shopping requirements (such as budget, preferences, and purpose) into subtasks. These subtasks are handled by e-commerce agents (such as Amazon) for queries, and the results are integrated to generate a shopping plan. The core features of the system are modularity and scalability, supporting dynamic adjustments and rapid iterations for optimization.

1.2 Purpose of the Manual

This manual aims to help users fully understand and efficiently use the intelligent shopping system. Through detailed guidance and instructions, users can easily get started and make the most of the system's features to meet personalized shopping needs. The manual is suitable for all users who wish to understand the system's functions and operations, including first-time users and advanced users seeking in-depth knowledge of the system's characteristics.

1.3 Project Background

The shopping system is based on the Mofa (https://github.com/moxin-org/mofa) intelligent agent software framework and developed by the SIMPLEST team as an intelligent shopping system that works through multi-agent collaboration. MoFa is a software framework for building AI agents using a compositional approach. Using MoFa, agents can be constructed through templates and combined in layers to form more powerful super agents, achieving enhanced functionality.

2. Software Overview

2.1 Objectives

Automated Requirement Analysis: Extract key information such as shopping budget, product preferences, and usage scenarios from user text input.

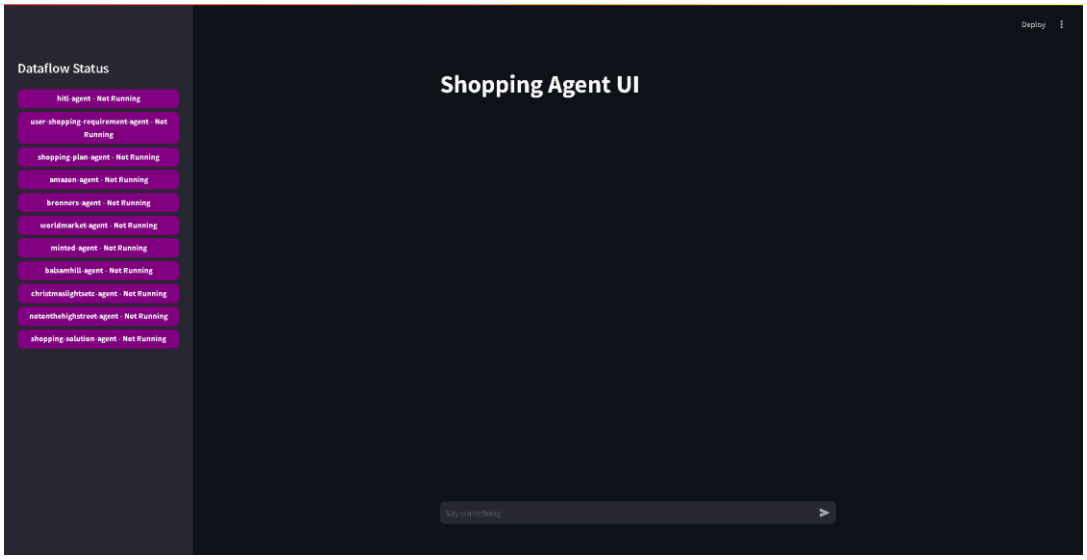
Task Decomposition and Planning: Automatically generate a list of query tasks based on user needs (e.g., search instructions for multiple e-commerce platforms).

Multi-source Information Aggregation: Obtain product information (price, specifications, stock, etc.) from different e-commerce agents, and perform cross-platform comparison and filtering.

Plan Generation and Feedback: Provide users with candidate shopping plans and support user feedback and further adjustments.

2.2 Features

2.2.1 Front-end Features



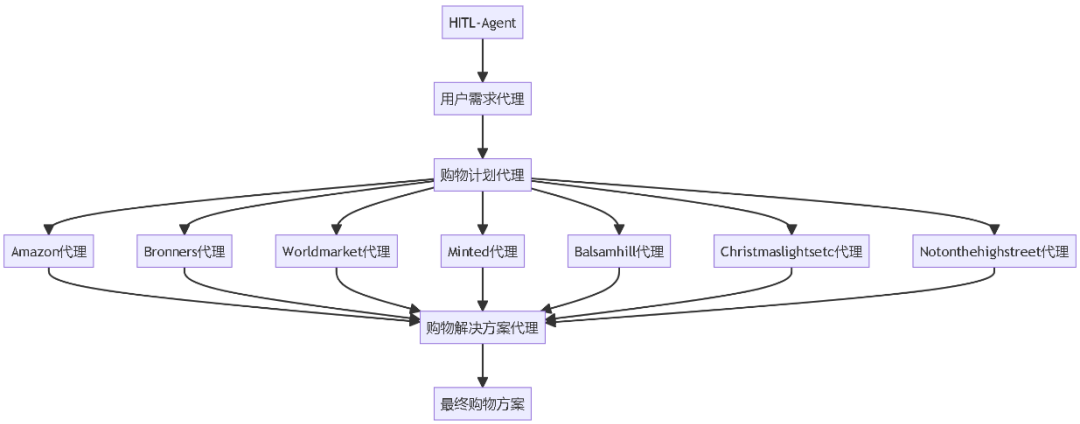
Dataflow Status Panel: Displays the operational status of various agents. Users can check whether each agent (e.g., HITL, Amazon, Bronners) is running, making it easy to monitor the overall system status. Note: Due to competition time constraints, there may be inaccuracies or delays in agent status updates. These will be addressed and improved in future versions.

Chat Window: Users can enter shopping needs and preferences here. The system will respond through the human-computer interaction agent and provide personalized shopping suggestions.

Real-time Feedback: The interface shows tasks currently being processed (e.g., "Bot is typing..."), allowing users to understand the current progress.

Input Box: Users can enter new commands or adjust preferences at any time in the input box at the bottom. The system will adjust its response strategies and provide more tailored feedback based on the input.

2.2.2 Back-end Features



a. **HITL-Agent (hitl-agent)**

Role: Entry point for user-system interaction.

Function: Receives initial user needs (user_input) and feedback on plans (shopping_solution_user_input, shopping_plan_user_input), such as "prefer NVIDIA graphics card"

or "increase budget to 8500 yuan."

b. **User Shopping Requirement Agent (user-shopping-requirement-agent)**

Function: Parses vague, natural language user needs into structured data for subsequent planning.

c. **Shopping Plan Agent (shopping-plan-agent)**

Function: Breaks down tasks into multiple e-commerce search instructions based on user needs, providing clear query parameters for each platform agent (e.g., search price range, brand, product type).

d. **E-commerce Agents** (e.g., amazon-agent, bronners-agent, worldmarket-agent, minted-agent, balsamhill-agent, christmaslightsetc-agent, notonthehighstreet-agent)

Function: Perform product queries and data retrieval for specific platforms, providing candidate product data for plan generation.

e. **Shopping Solution Agent (shopping-solution-agent)**

Function: Filters, combines, and ranks candidate products based on user needs and data returned from each platform, generating the final shopping plan.

The core processing logic involves modular task decomposition and execution, achieving fast, personalized shopping plan generation through parallel processing by multiple agents.

3. Operating Environment

3.1 Supported Software

a. **Operating System**:

Windows with WSL or Linux (Ubuntu 20.04 and above) and macOS [to be added].

b. **Programming Language and Compilation System**:

Python 3.10 and above.

c. **Other Necessary Software**:

Chrome and Chromedriver

To install necessary components, run:

```
sudo apt-get update
sudo apt-get install -y curl unzip xvfb libxi6 libgconf-2-4
wget https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb
sudo apt install ./google-chrome-stable_current_amd64.deb
```

Ensure Chrome is installed successfully:

```
google-chrome --version
```

Get the Chromedriver version that matches the installed Chrome version from: https://chromedriver.chromium.org/

Download, unzip, and configure the environment:

```
# Replace with the correct version number for your installed browser
wget https://chromedriver.storage.googleapis.com/86.0.4240.22/chromedriver_linux64.zip
unzip chromedriver_linux64.zip
sudo mv chromedriver /usr/bin/chromedriver
sudo chown root:root /usr/bin/chromedriver
sudo chmod +x /usr/bin/chromedriver
```

Ensure Chromedriver is installed successfully:

chromedriver --version

If you have previously installed Chromedriver on Windows and added its path to PATH, ensure it now points to the newly extracted Chromedriver.

```
which chromedriver
 # should be /usr/bin/chromedriver
```

For more detailed steps, please refer to the deployment documentation in the source code repository.

4. Quick Start

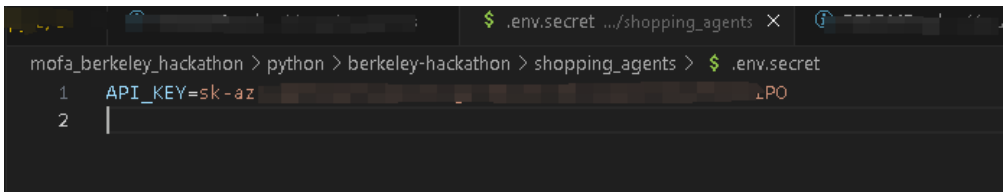
4.1 System Initialization

4.1.1 Start the Backend

Make sure to run the files in the order described below. Incorrect startup sequence will result in failure to run.

a. First, navigate to the python/berkeley-hackathon/shopping_agents directory.

Create a file named .env.secret in the current directory with the following structure:



b. Run the following command in the current directory:

dora up && dora build shopping_dataflow.yml && dora start shopping_dataflow.yml --attach

If you see the ID number in the red box as shown in the image, it means the dataflow has started successfully.

```
(py310) root@DESKTOP-8MIQOKD:/home/testMofaEnv/mofa_berkeley_hack
athon/python/berkeley-hackathon/shopping_agents# dora up && dora
build shopping_dataflow.yml && dora start shopping_dataflow.yml -
-attach
Obtaining file:///home/testMofaEnv/mofa_berkeley_hackathon/python
/berkeley-hackathon/shopping_agents/hitl-agent
  Installing build dependencies ... done
  Checking if build backend supports build_editable ... done
  Getting requirements to build editable ... done
  Preparing editable metadata (pyproject.toml) ... done
Requirement already satisfied: numpy<2.0.0 in /root/miniconda3/en
vs/py310/lib/python3.10/site-packages (from hitl-agent==0.3.6) (1
.26.4)
Requirement already satisfied: pyarrow>=5.0.0 in /root/miniconda3
/envs/py310/lib/python3.10/site-packages (from hitl-agent==0.3.6)
 (17.0.0)
Building wheels for collected packages: hitl-agent
  Building editable for hitl-agent (pyproject.toml) ... done
  Created wheel for hitl-agent: filename=hitl_agent-0.3.6-py2.py3
-none-any.whl size=1560 sha256=685a52bf5d7d31315097c9530eec3697ff
95841770b5b6e4b43c2741a2e8d4a4
  Stored in directory: /tmp/pip-ephem-wheel-cache-sjm7tg30/wheels
/47/96/8b/59b293a744f9cb96dced43dad21511dc8bb8160a2612d8da40
Successfully built hitl-agent
Installing collected packages: hitl-agent
  Attempting uninstall: hitl-agent
    Found existing installation: hitl-agent 0.3.6
    Uninstalling hitl-agent-0.3.6:
      Successfully uninstalled hitl-agent-0.3.6
Successfully installed hitl-agent-0.3.6

0193da6e-bea4-713f-bedd-e3136798ce3d
```

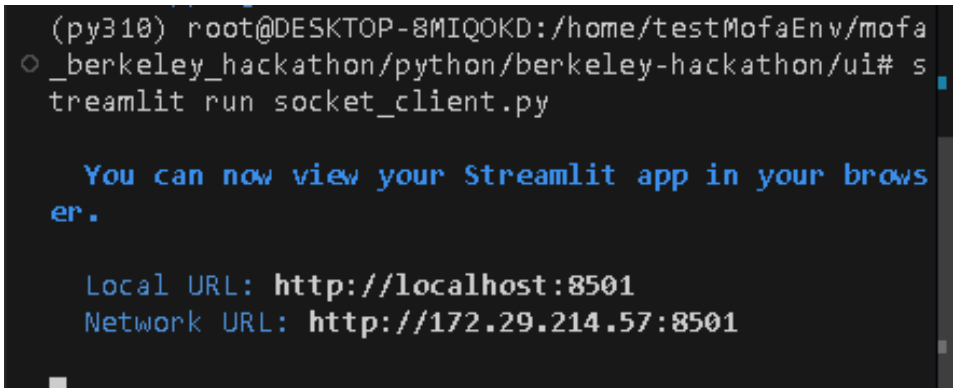
c. In another command terminal, run the hitl-agent.

```
(py310) root@DESKTOP-8MIQOKD:/home/testMofaEnv/mofa_berkele
y_hackathon/python/berkeley-hackathon/shopping_agents# hitl
-agent
Server running on 127.0.0.1:12345...
Connected by ('127.0.0.1', 56752)
```

d. Open a third command terminal and run the following command:

cd /mofa_berkeley_hackathon/python/berkeley-hackathon/ui && streamlit run socket_client.py

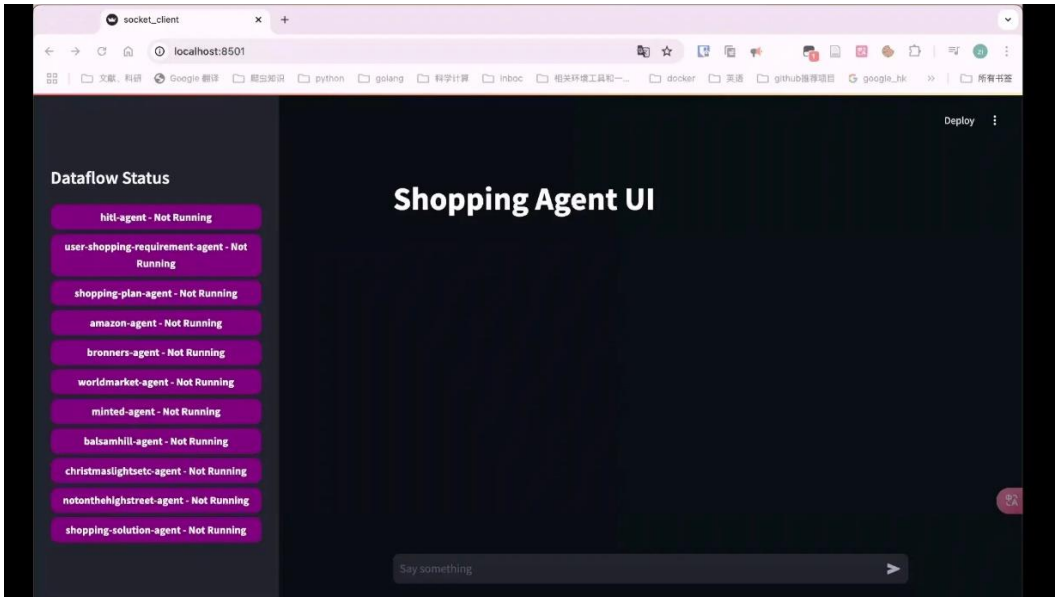
This will open your page.



Ensure that your port 12345 is not occupied. If it is, use lsof -i :12345 to check the process ID occupying it, and use kill -9 to terminate it.

4.2.2 Front-end Usage

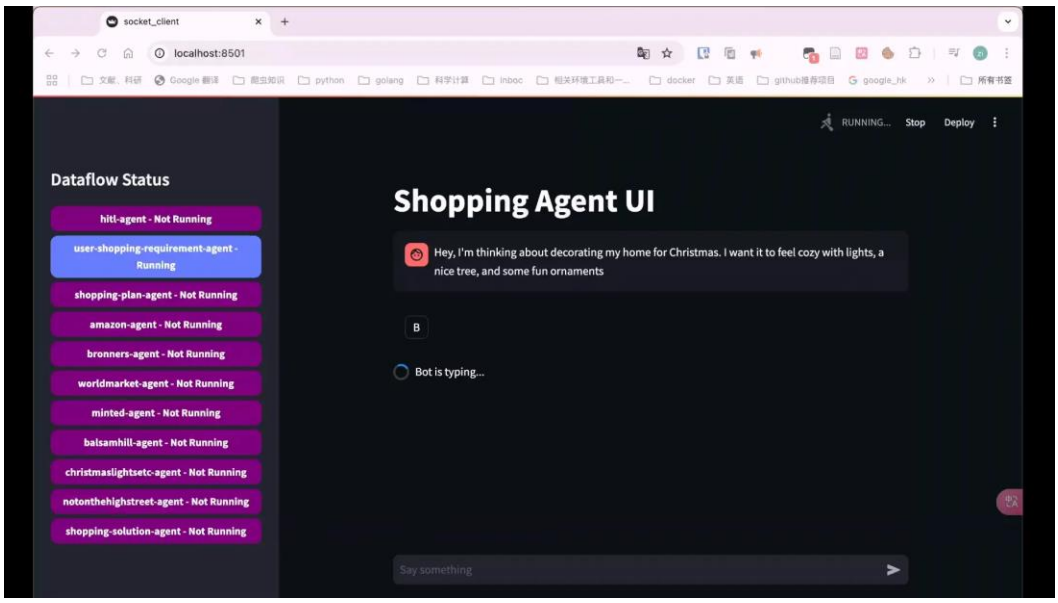
We will use "setting up a Christmas scene with decorations" as an example to demonstrate the process.

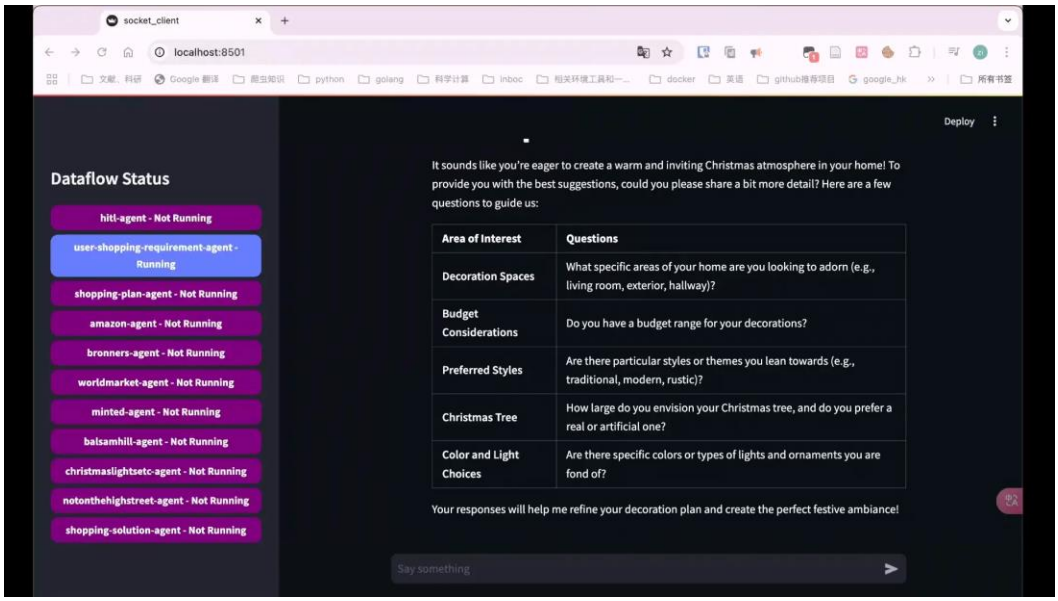


If you successfully start the backend, it will automatically redirect to the webpage shown above. Next, begin your dialogue task in the conversation box on the webpage.

Step 1: Express Your Needs

"Hey, I'm thinking about decorating my home for Christmas. I want it to feel cozy with lights, a nice tree, and some fun ornaments."

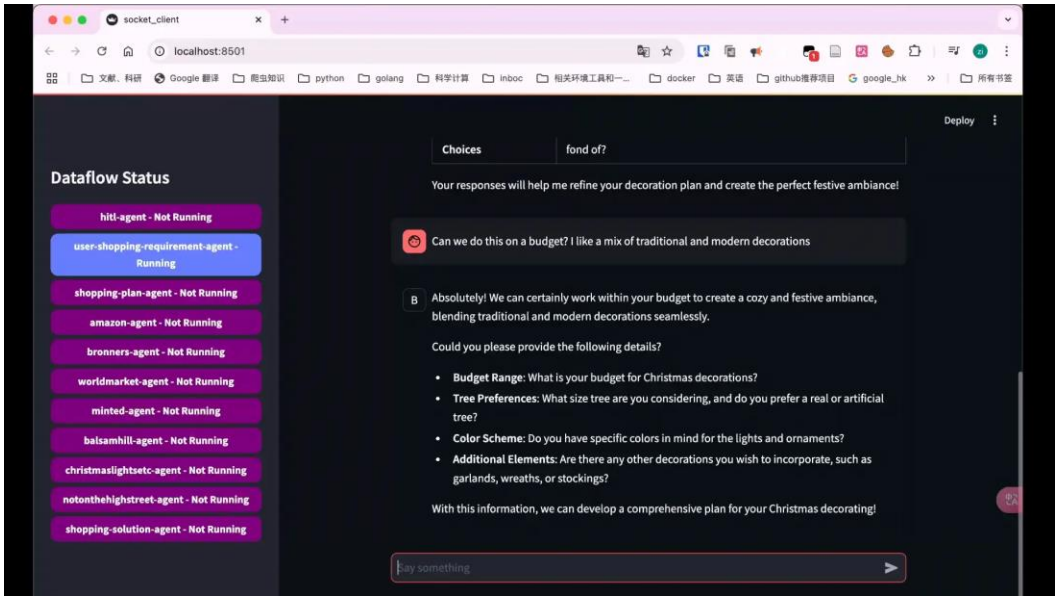




The system responds as above, expecting you to provide further details to offer better recommendations.

Step 2: Additional Requirements

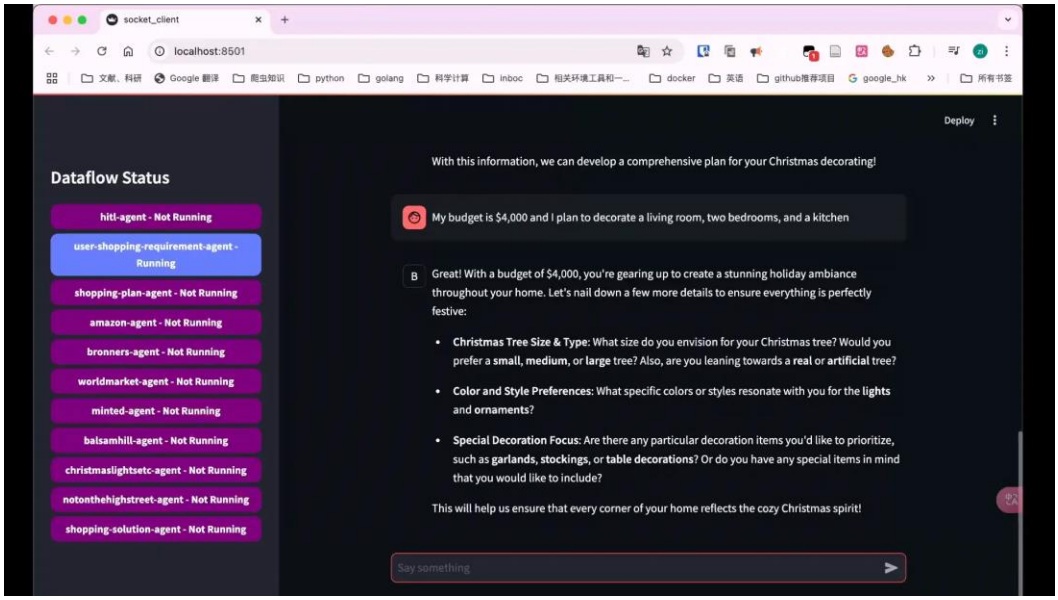
"Can we do this on a budget? I like a mix of traditional and modern decorations."



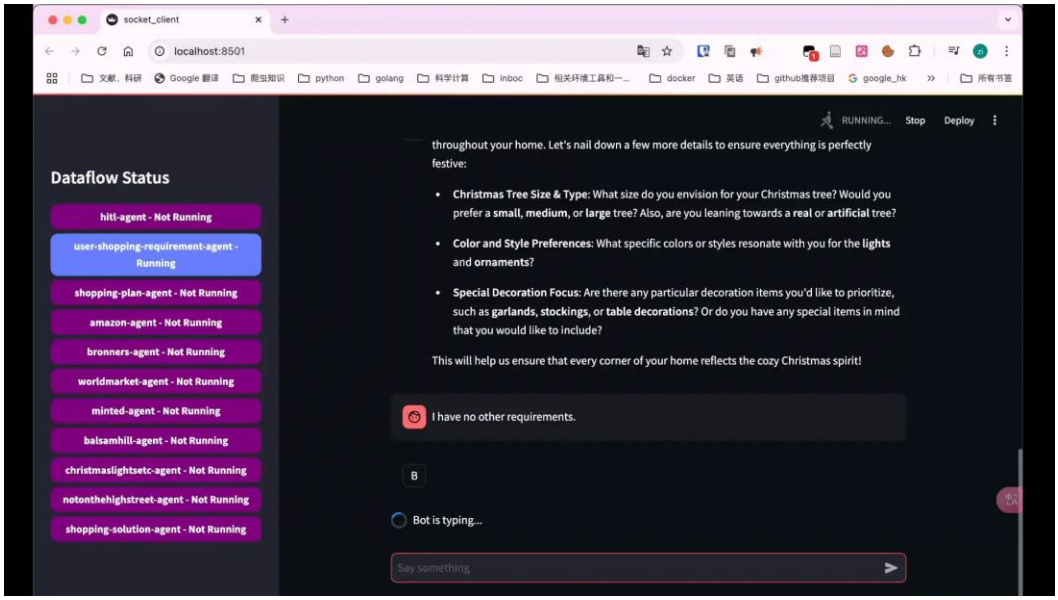
Continue refining your needs. The system will guide you through your requirements, so feel free to express yourself.

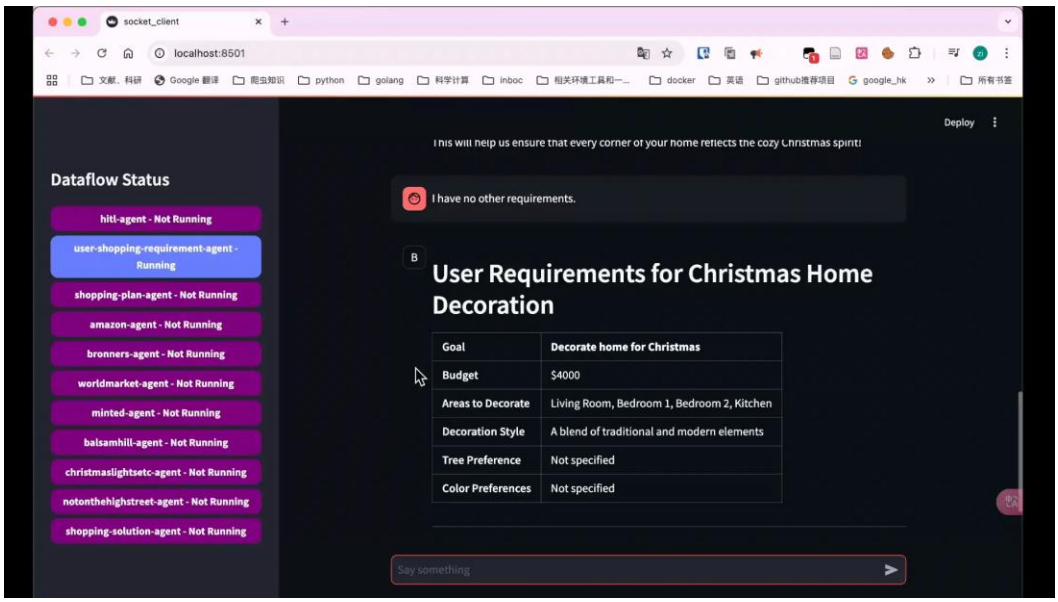
Step 3: Generate Shopping Plan

"Can you put together a list of things I should get? If you have any cute DIY ideas, I'd love to see those too!"



At this point, a rough plan is completed. The system will continue to ask for fine-tuning.


socket_client
localhost:8501
RUNNING...
Stop
Deploy
Dataflow Status
hitl-agent - Not Running
user-shopping-requirement-agent - Running
shopping-plan-agent - Not Running
amazon-agent - Not Running
bronners-agent - Not Running
worldmarket-agent - Not Running
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
throughout your home. Let's nail down a few more details to ensure everything is perfectly festive:
Christmas Tree Size & Type: What size do you envision for your Christmas tree? Would you prefer a small, medium, or large tree? Also, are you leaning towards a real or artificial tree?
Color and Style Preferences: What specific colors or styles resonate with you for the lights and ornaments?
Special Decoration Focus: Are there any particular decoration items you'd like to prioritize, such as garlands, stockings, or table decorations? Or do you have any special items in mind that you would like to include?
This will help us ensure that every corner of your home reflects the cozy Christmas spirit!
I have no other requirements.
B
Bot is typing...
Say something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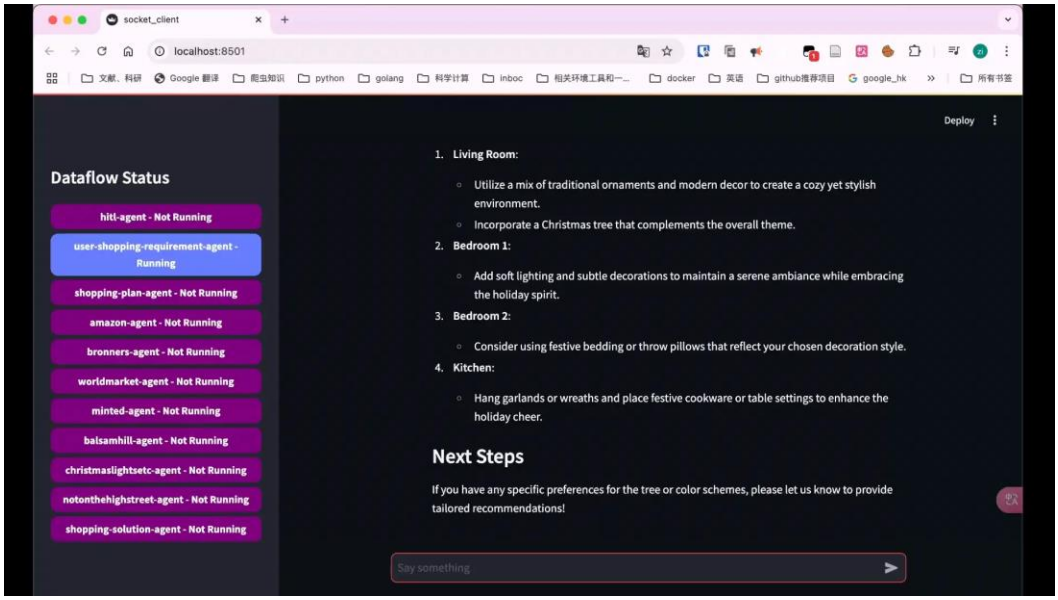
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
This will help us ensure that every corner of your home reflects the cozy Christmas spirit!
I have no other requirements.
B
User Requirements for Christmas Home Decoration
Goal
Decorate home for Christmas
Budget
$4000
Areas to Decorate
Living Room, Bedroom 1, Bedroom 2, Kitchen
Decoration Style
A blend of traditional and modern elements
Tree Preference
Not specified
Color Preferences
Not specified
Say something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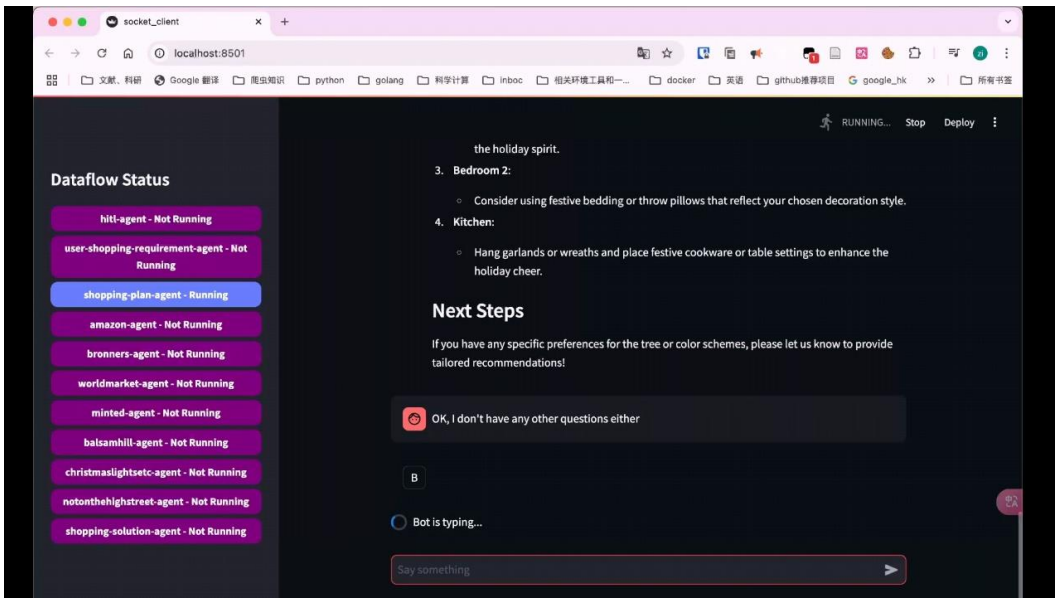
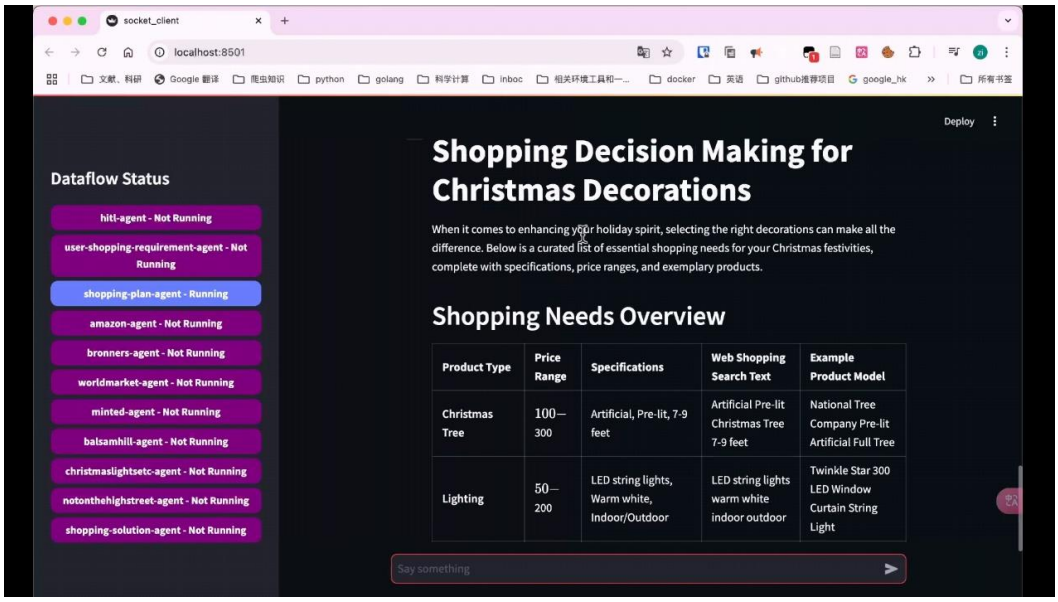
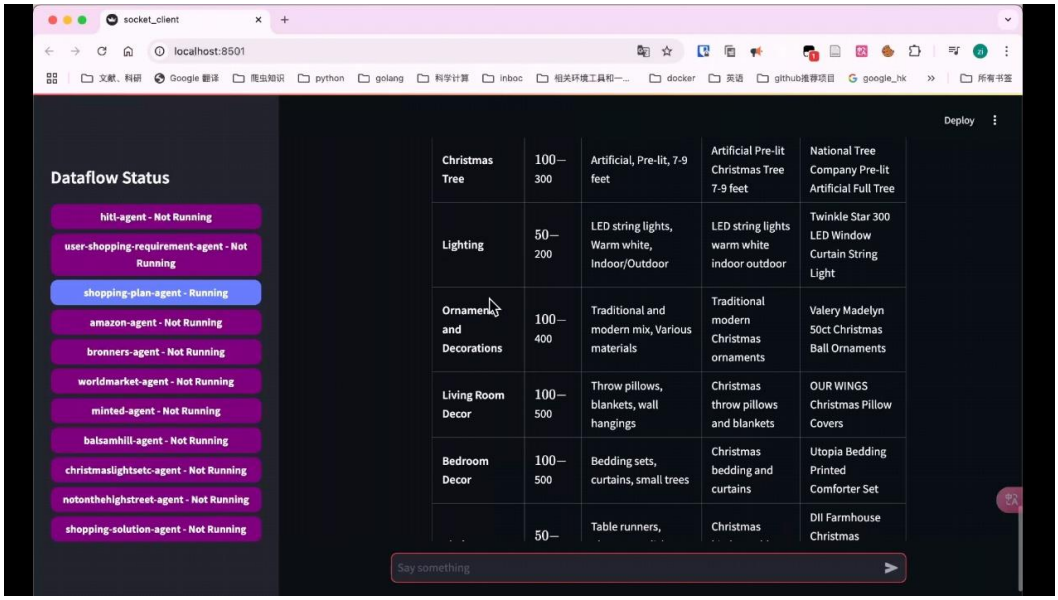
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
1. Living Room:
Utilize a mix of traditional ornaments and modern decor to create a cozy yet stylish environment.
Incorporate a Christmas tree that complements the overall theme.
2. Bedroom 1:
Add soft lighting and subtle decorations to maintain a serene ambiance while embracing the holiday spirit.
3. Bedroom 2:
Consider using festive bedding or throw pillows that reflect your chosen decoration style.
4. Kitchen:
Hang garlands or wreaths and place festive cookware or table settings to enhance the holiday cheer.
Next Steps
If you have any specific preferences for the tree or color schemes, please let us know to provide tailored recommendations!
Say something

Step 4: Fine-tune the Shopping Plan

"These ideas are awesome! I love the wreath suggestion. Can you also add some nice dinnerware for our Christmas dinner to the list?"



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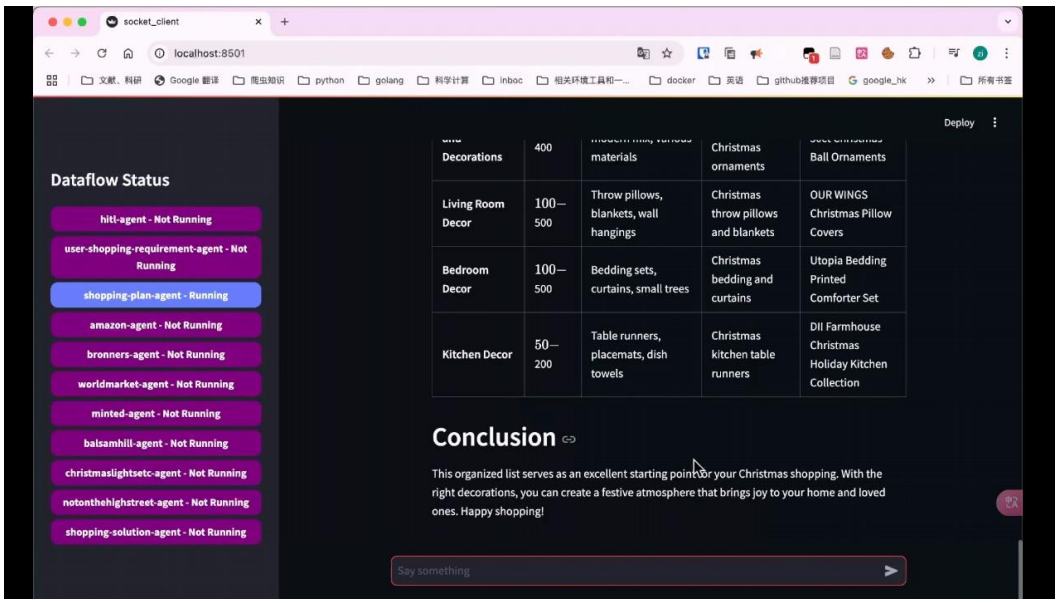
worldmarket-agent - Not Running
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
Christmas Tree
100–300
Artificial, Pre-lit, 7-9 feet
Artificial Pre-lit Christmas Tree 7-9 feet
National Tree Company Pre-lit Artificial Full Tree
Lighting
50–200
LED string lights, Warm white, Indoor/Outdoor
LED string lights warm white indoor outdoor
Twinkle Star 300 LED Window Curtain String Light
Ornaments and Decorations
100–400
Traditional and modern mix, Various materials
Traditional modern Christmas ornaments
Valery Madelyn 50ct Christmas Ball Ornaments
Living Room Decor
100–500
Throw pillows, blankets, wall hangings
Christmas throw pillows and blankets
OUR WINGS Christmas Pillow Covers
Bedroom Decor
100–500
Bedding sets, curtains, small trees
Christmas bedding and curtains
Utopia Bedding Printed Comforter Set
50–
Table runners,
Christmas
DII Farmhouse Christmas
Say something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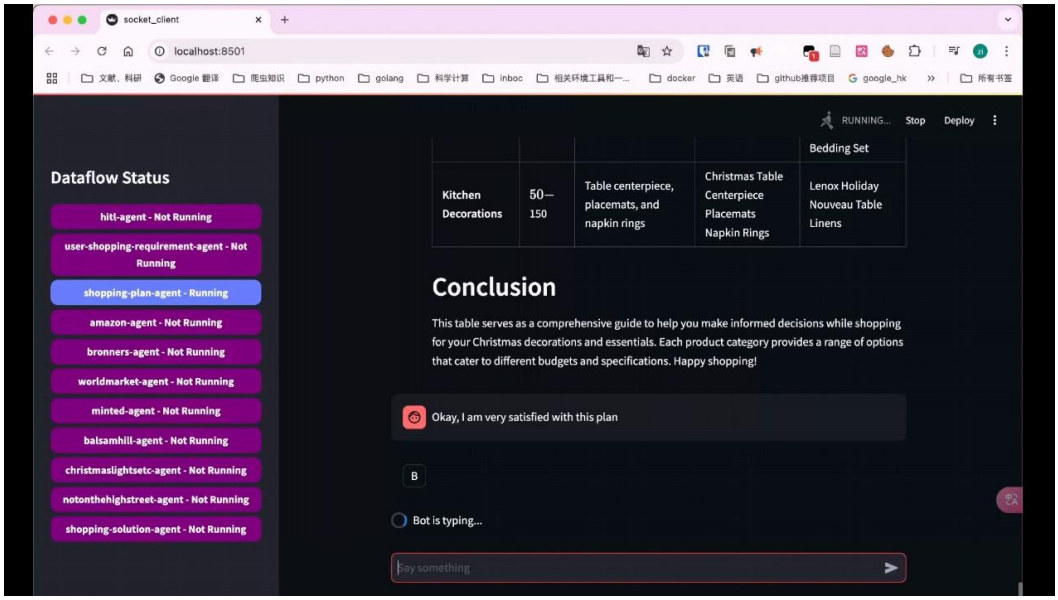
worldmarket-agent - Not Running
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
Decorations
400
materials
Christmas ornaments
Ball Ornaments
Living Room Decor
100–500
Throw pillows, blankets, wall hangings
Christmas throw pillows and blankets
OUR WINGS Christmas Pillow Covers
Bedroom Decor
100–500
Bedding sets, curtains, small trees
Christmas bedding and curtains
Utopia Bedding Printed Comforter Set
Kitchen Decor
50–200
Table runners, placemats, dish towels
Christmas kitchen table runners
DII Farmhouse Christmas Holiday Kitchen Collection
Conclusion
This organized list serves as an excellent starting point for your Christmas shopping. With the right decorations, you can create a festive atmosphere that brings joy to your home and loved ones. Happy shopping!
Say something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RUNNING...
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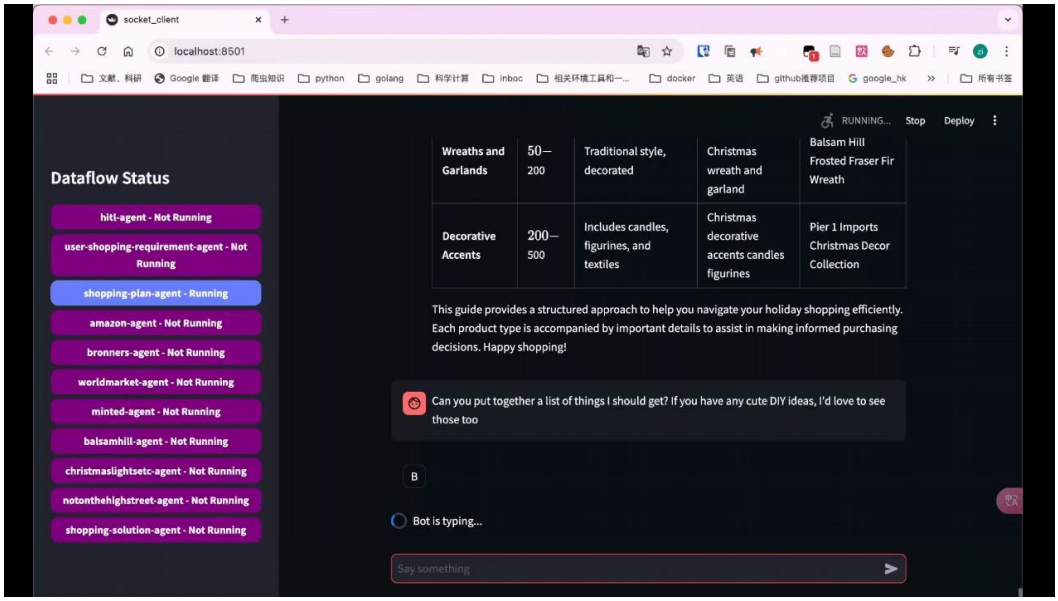
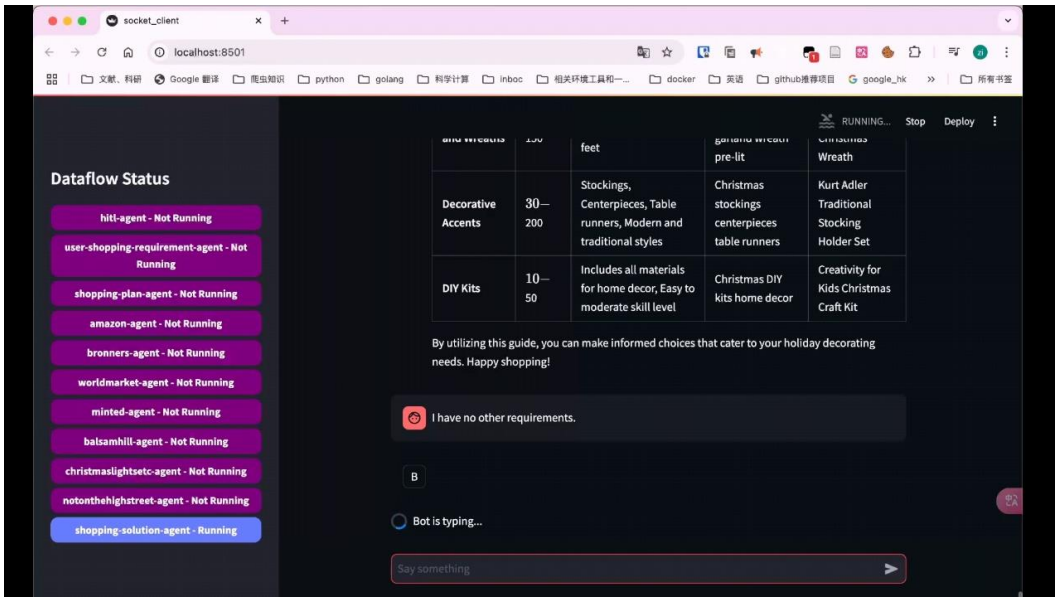
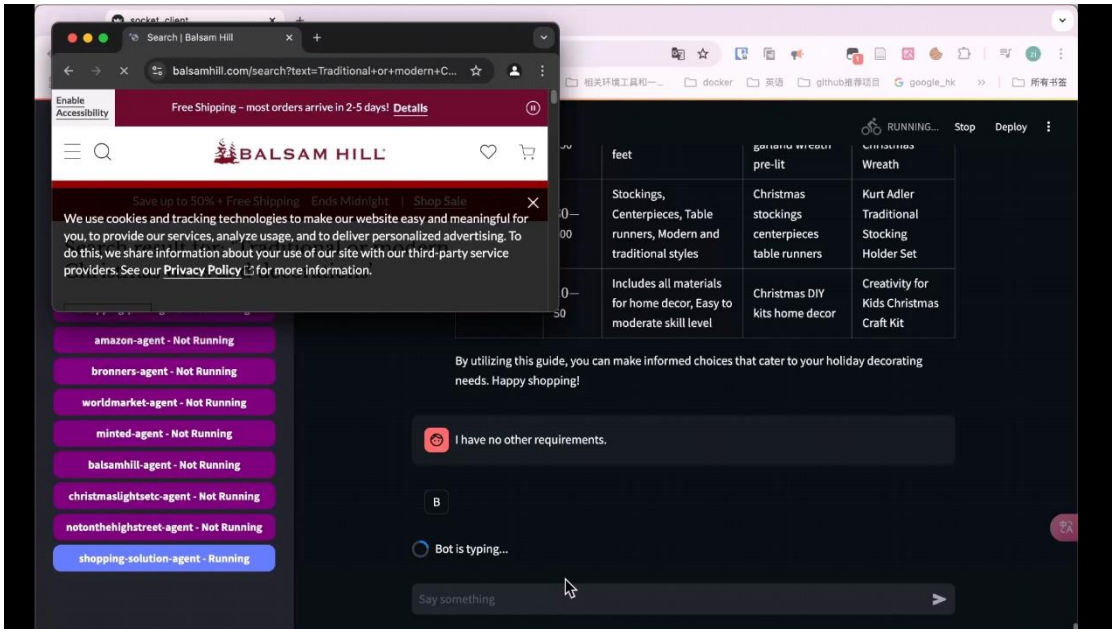
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Not Running
Bedding Set
Kitchen Decorations
50–150
Table centerpiece, placemats, and napkin rings
Christmas Table Centerpiece Placemats Napkin Rings
Lenox Holiday Nouveau Table Linens
Conclusion
This table serves as a comprehensive guide to help you make informed decisions while shopping for your Christmas decorations and essentials. Each product category provides a range of options that cater to different budgets and specifications. Happy shopping!
Okay, I am very satisfied with this plan
B
Bot is typing...
Say something

Step 5: Provide Product Recommendations

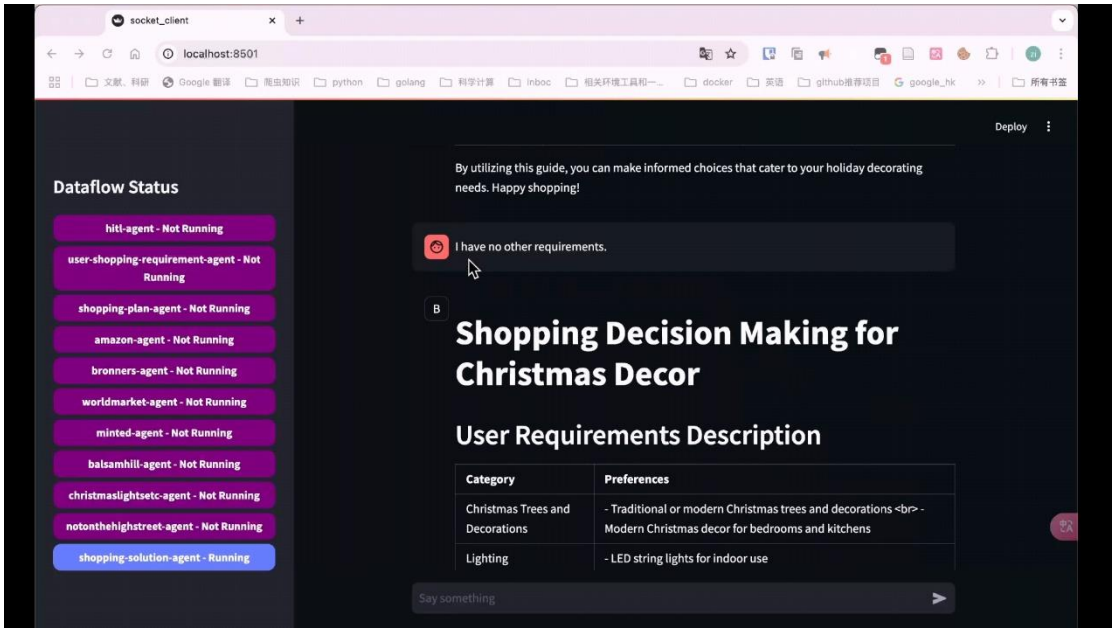
"Okay, I am very satisfied with this plan." I have no other requirements.





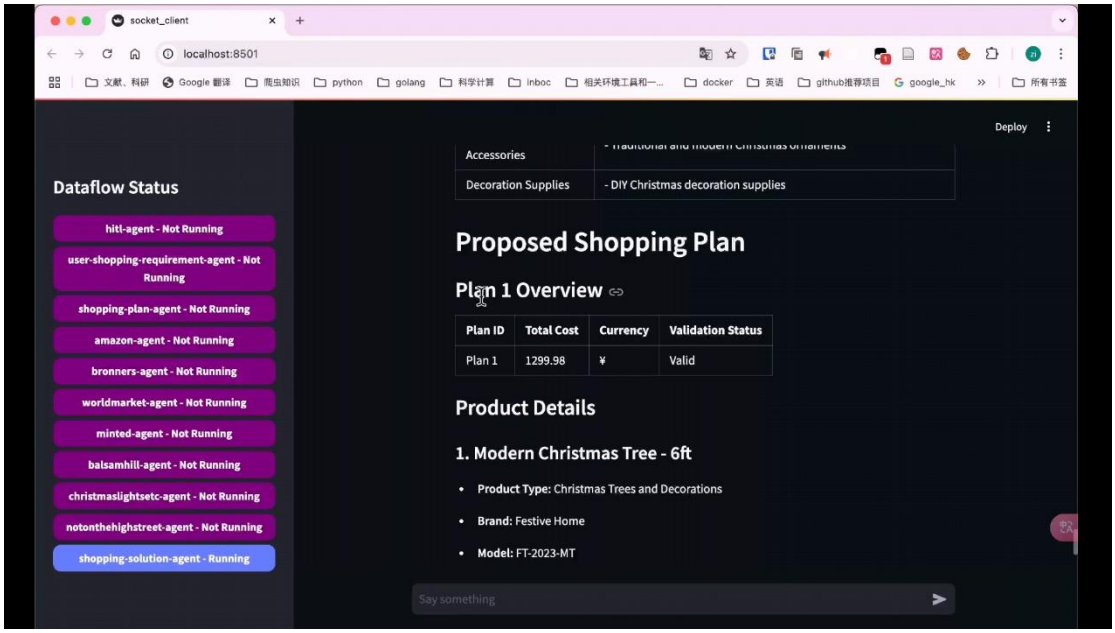


The system will start retrieving data from shopping websites to search for items in your plan. The data status on the left will update to the result search phase, which is the shopping-solution-agent.



Due to varying network speeds in different regions, the system's response time may take around 1-2 minutes. Once the search is complete, the system will provide a final report as shown in the example.

Note: Our item search agent is based on Selenium, so results may be affected by webpage changes or network conditions. It's normal for the agent to sometimes find no items, and results may not be consistent every time.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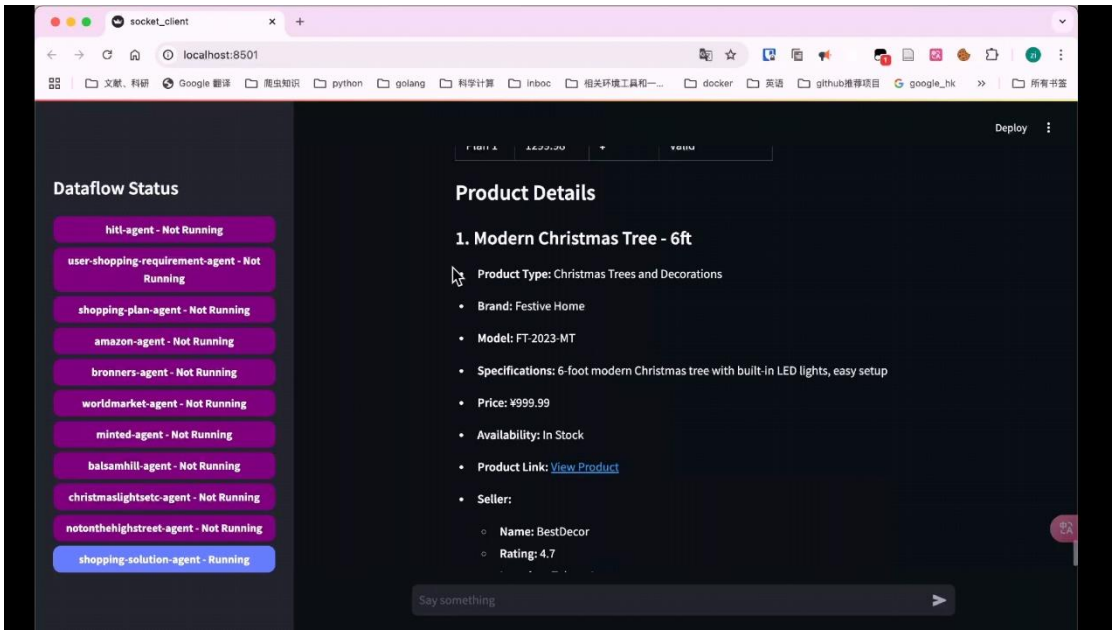
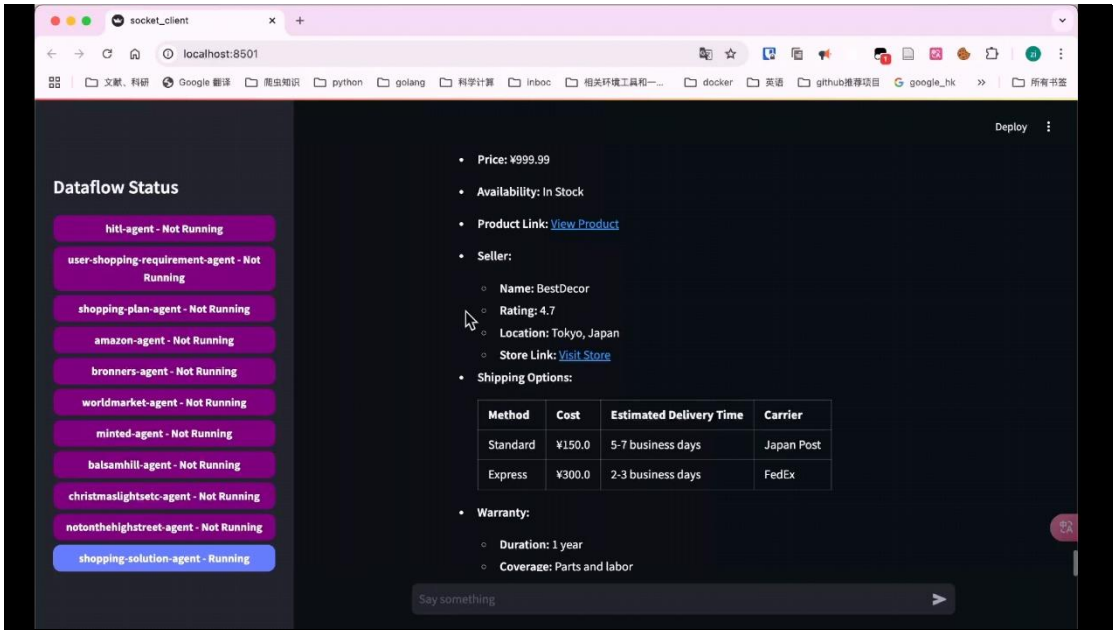
worldmarket-agent - Not Running
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Running
Accessories
Decoration Supplies
- DIY Christmas decoration supplies
Proposed Shopping Plan
Plan 1 Overview
Plan ID
Total Cost
Currency
Validation Status
Plan 1
1299.98
¥
Valid
Product Details
1. Modern Christmas Tree - 6ft
Product Type: Christmas Trees and Decorations
Brand: Festive Home
Model: FT-2023-MT
Say something


socket_client
localhost:8501
Deploy
Dataflow Status
hitl-agent - Not Running
user-shopping-requirement-agent - Not Running
shopping-plan-agent - Not Running
amazon-agent - Not Running
bronners-agent - Not Running
worldmarket-agent - Not Running
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Running
Product Details
1. Modern Christmas Tree - 6ft
Product Type: Christmas Trees and Decorations
Brand: Festive Home
Model: FT-2023-MT
Specifications: 6-foot modern Christmas tree with built-in LED lights, easy setup
Price: ¥999.99
Availability: In Stock
Product Link: View Product
Seller:
Name: BestDecor
Rating: 4.7
Say something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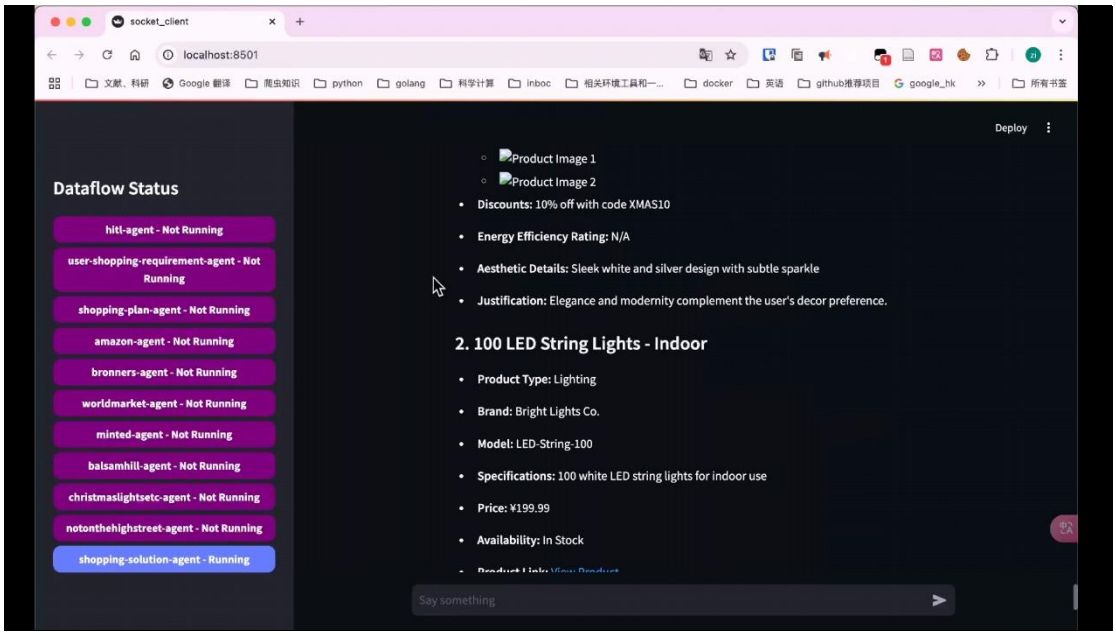
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Running
Price: ¥999.99
Availability: In Stock
Product Link: View Product
Seller:
Name: BestDecor
Rating: 4.7
Location: Tokyo, Japan
Store Link: Visit Store
Shipping Options:
Method | Cost | Estimated Delivery Time | Carrier
Standard | ¥150.0 | 5-7 business days | Japan Post
Express | ¥300.0 | 2-3 business days | FedEx
Warranty:
Duration: 1 year
Coverage: Parts and labor
Say something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localhost:8501
Deploy
Dataflow Status
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user-shopping-requirement-agent - Not Running
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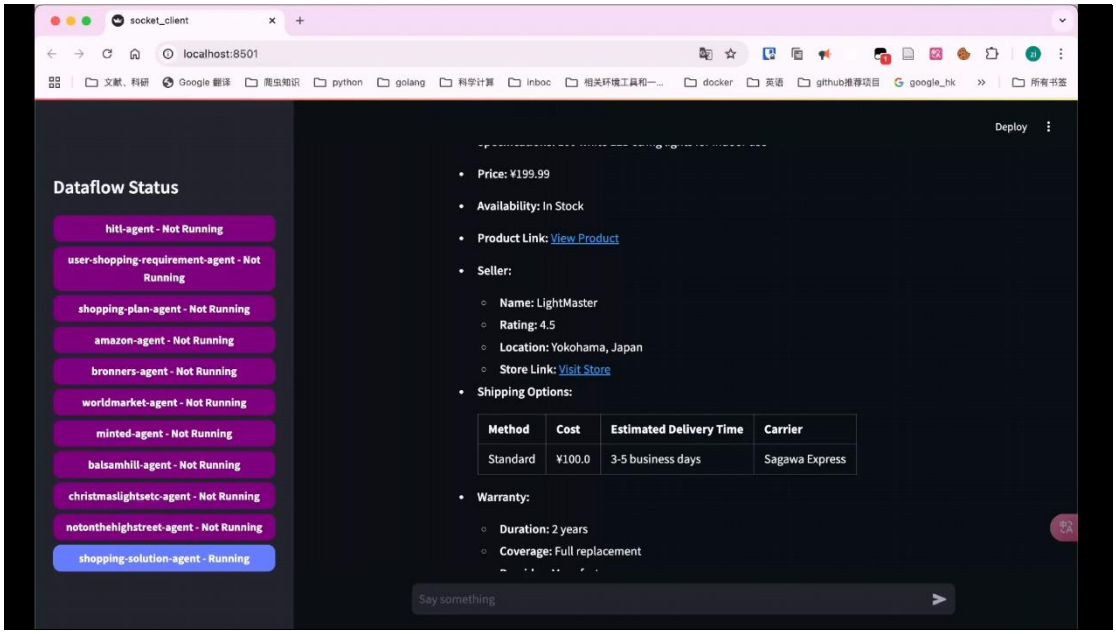
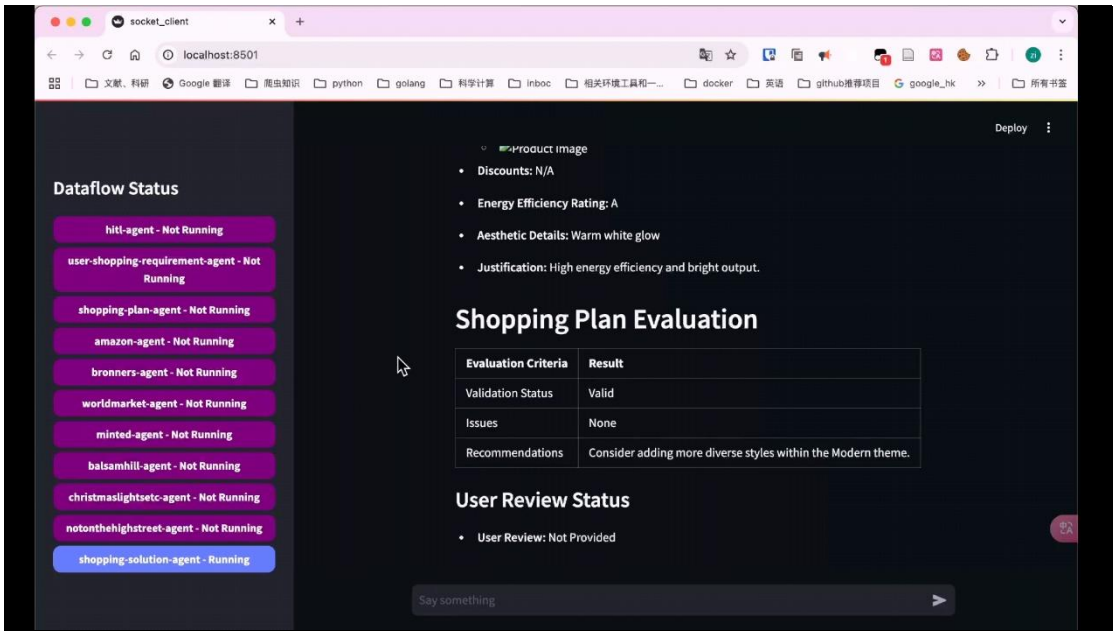
minted-agent - Not Running
balsamhill-agent - Not Running
christmaslightsetc-agent - Not Running
notonthehighstreet-agent - Not Running
shopping-solution-agent - Running
Product Image 1
Product Image 2
Discounts: 10% off with code XMAS10
Energy Efficiency Rating: N/A
Aesthetic Details: Sleek white and silver design with subtle sparkle
Justification: Elegance and modernity complement the user's decor preference.
2. 100 LED String Lights - Indoor
Product Type: Lighting
Brand: Bright Lights Co.
Model: LED-String-100
Specifications: 100 white LED string lights for indoor use
Price: ¥199.99
Availability: In Stock
Say something



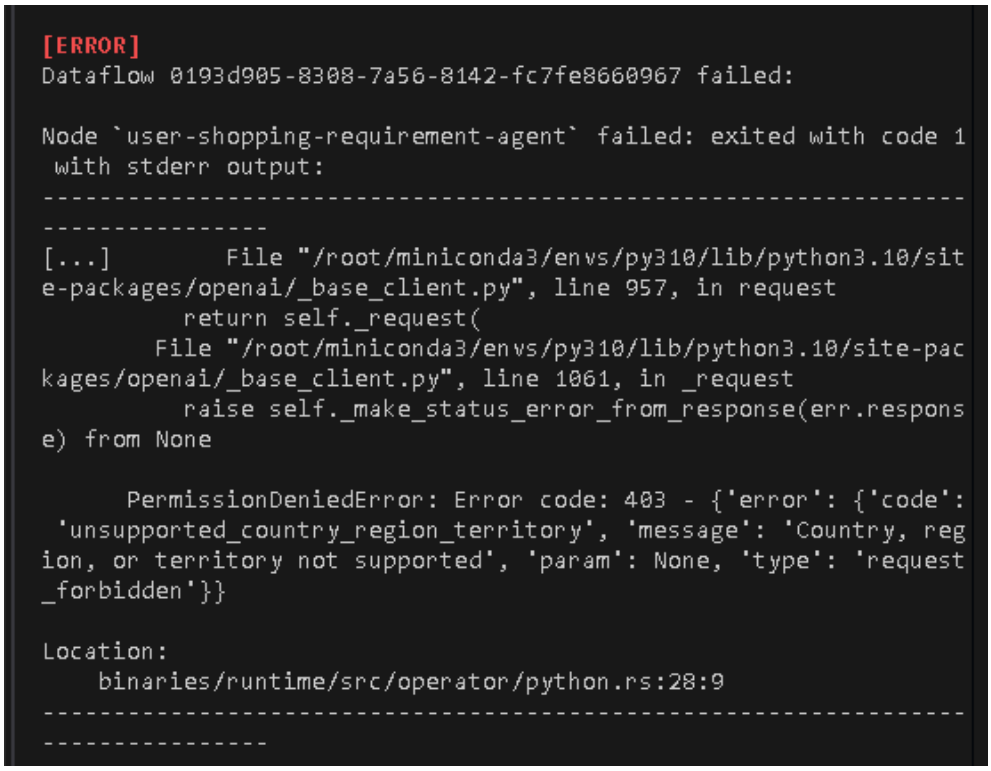


The system will ultimately provide a comprehensive shopping suggestion, including multiple items. Each item's type, brand, model, features, price, and discounts will be summarized for you. Finally, an evaluation of the shopping plan will be provided to help you better adjust your plan.

5 Common Issues

5.1 Troubleshooting [To be added]

a. Errors due to incorrect proxy node settings causing access denial or slow network speeds, or connection errors due to node issues.

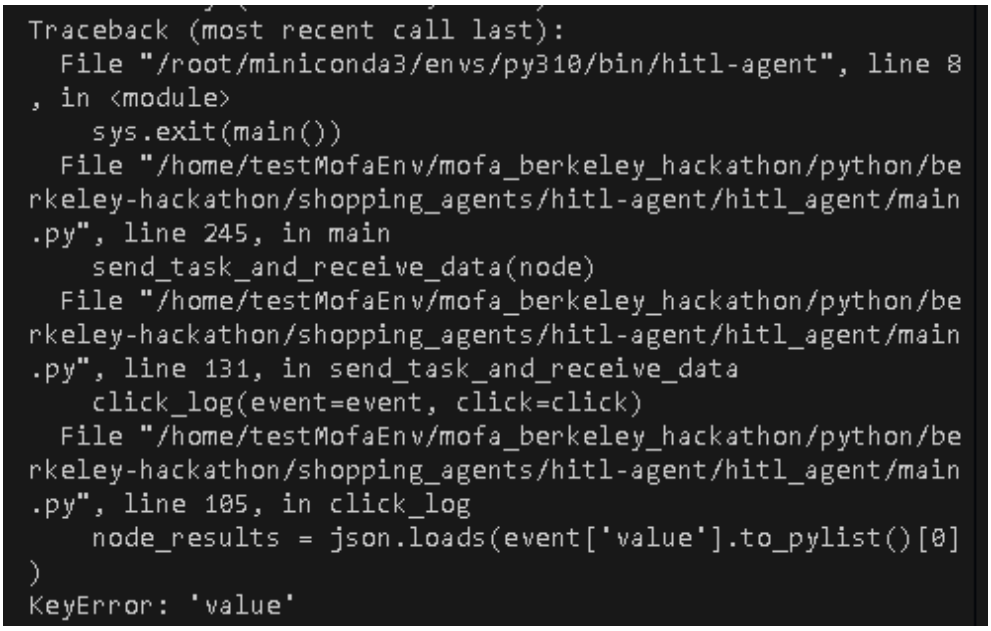


```
[ERROR]
Dataflow 0193d905-8308-7a56-8142-fc7fe8660967 failed:

Node `user-shopping-requirement-agent` failed: exited with code 1
 with stderr output:
--------------------------------------------------------------------
---------------
[...]        File "/root/miniconda3/envs/py310/lib/python3.10/sit
e-packages/openai/_base_client.py", line 957, in request
          return self._request(
        File "/root/miniconda3/envs/py310/lib/python3.10/site-pac
kages/openai/_base_client.py", line 1061, in _request
          raise self._make_status_error_from_response(err.respons
e) from None

      PermissionDeniedError: Error code: 403 - {'error': {'code':
 'unsupported_country_region_territory', 'message': 'Country, reg
ion, or territory not supported', 'param': None, 'type': 'request
_forbidden'}}

Location:
    binaries/runtime/src/operator/python.rs:28:9
--------------------------------------------------------------------
---------------
```



```
Traceback (most recent call last):
  File "/root/miniconda3/envs/py310/bin/hitl-agent", line 8
, in <module>
    sys.exit(main())
  File "/home/testMofaEnv/mofa_berkeley_hackathon/python/be
rkeley-hackathon/shopping_agents/hitl-agent/hitl_agent/main
.py", line 245, in main
    send_task_and_receive_data(node)
  File "/home/testMofaEnv/mofa_berkeley_hackathon/python/be
rkeley-hackathon/shopping_agents/hitl-agent/hitl_agent/main
.py", line 131, in send_task_and_receive_data
    click_log(event=event, click=click)
  File "/home/testMofaEnv/mofa_berkeley_hackathon/python/be
rkeley-hackathon/shopping_agents/hitl-agent/hitl_agent/main
.py", line 105, in click_log
    node_results = json.loads(event['value'].to_pylist()[0]
)
KeyError: 'value'
```

Solution: Change the proxy node to a U.S. node, even if the latency is higher than other Asian or European nodes.

b. Front-end data flow status not updating... [To be added]

6. Maintenance and Updates

6.1 Update Guide

Run the following commands to fetch the latest code before running the backend:

```
git fetch origin
git pull origin develop
```

Our branch is develop. If you switch branches, replace with the branch name you want to pull.

7. Support and Feedback

Technical Support: If you have any questions about the code or anything else, feel free to contact our technical team:

- **Contact Information**: [To be added]

Feedback Channels: You can submit a pull request on GitHub or use the contact information above to communicate your suggestions or feedback to our technical team.