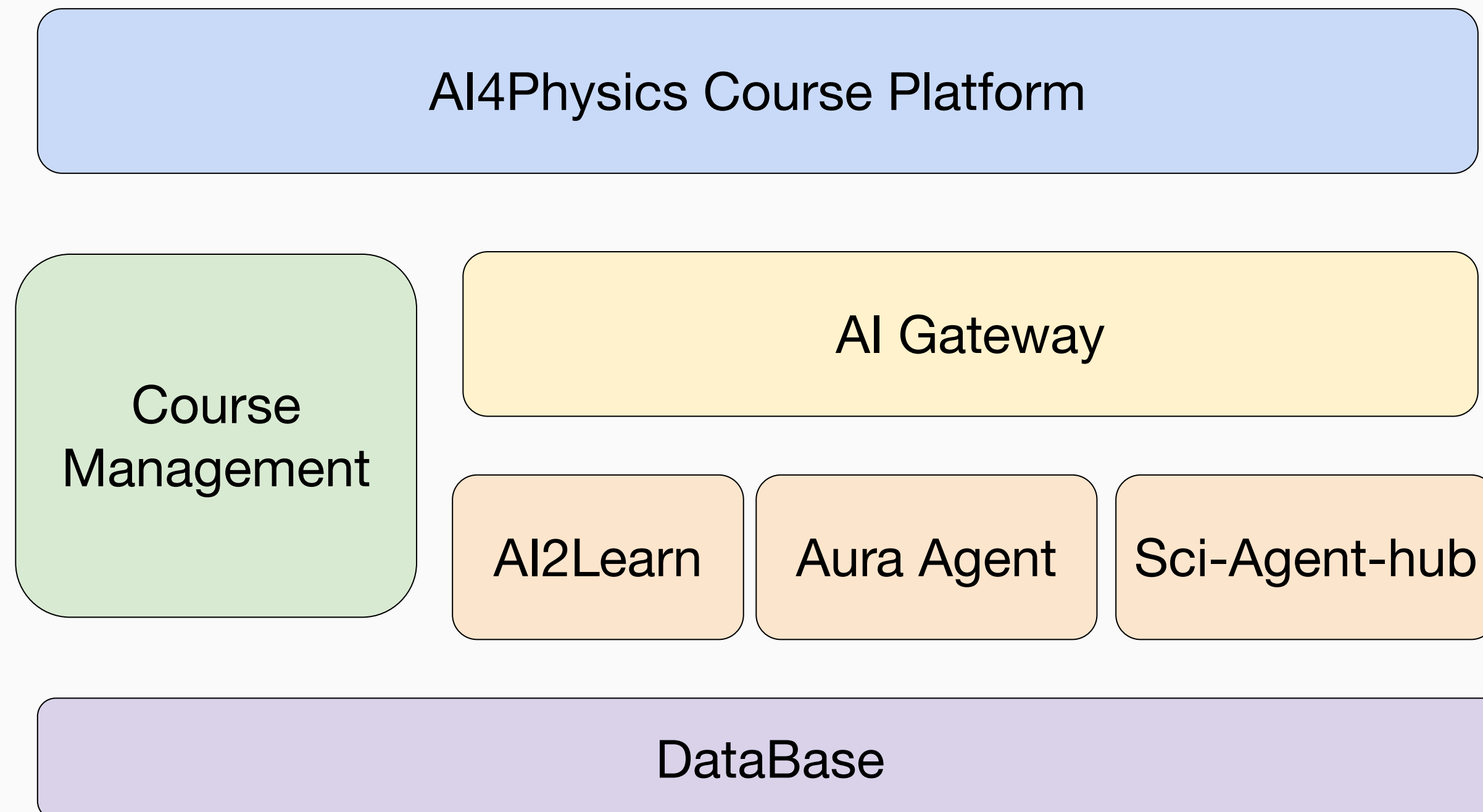


An AI Agent Platform for Teaching Assistance and Research Training in the AI4Physics Innovation Laboratory

Zhu Chen

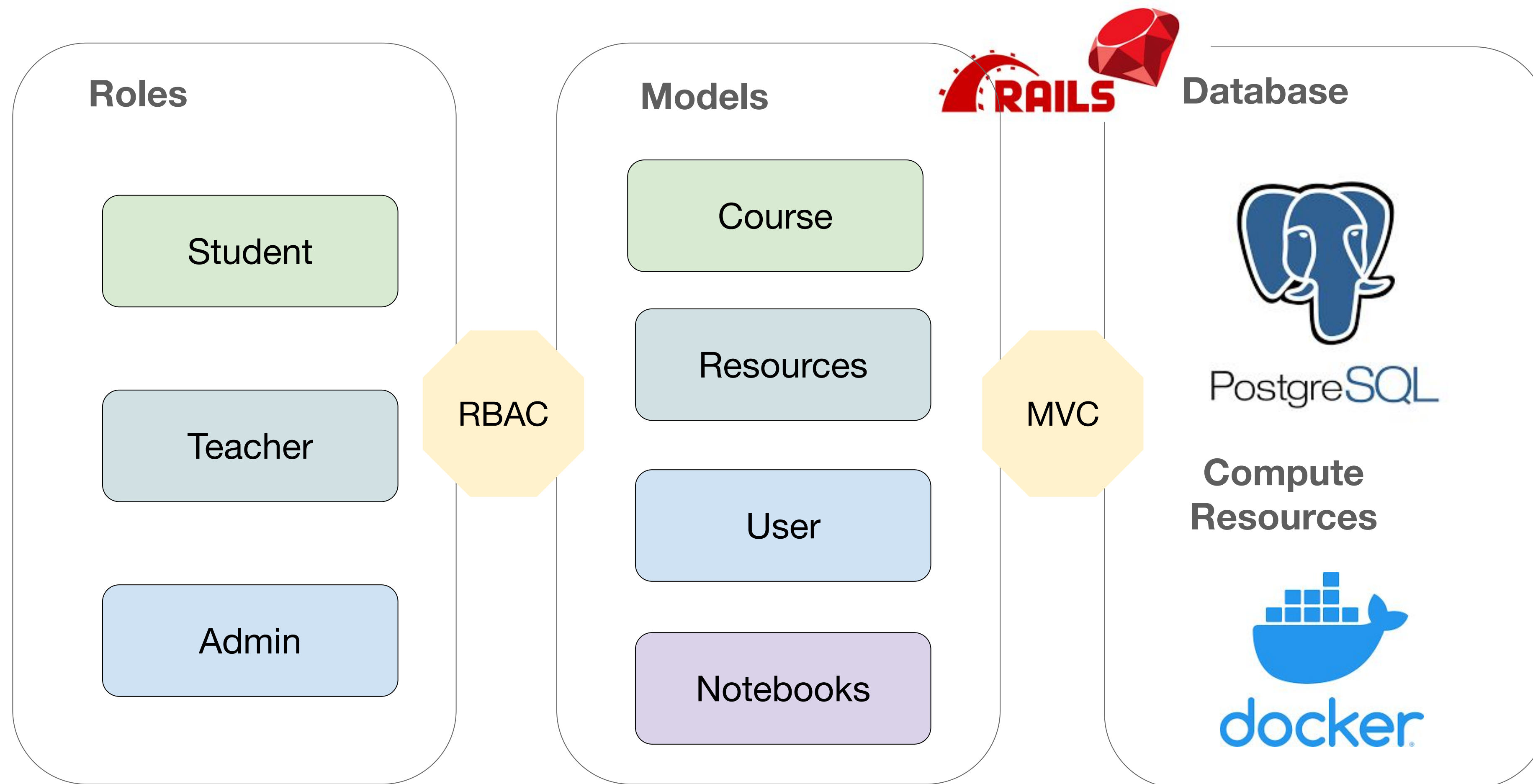
2026.5.27

An AI4Physics Platform Integrated with AI Services



```
(base) frank@zhuchens-MacBook-Pro AI-course-platform %  
bin/routes_demonstrate  
/admin  
/admin/courses  
/admin/resources  
/admin/users  
/ai_playground  
/ai_playground/aura_agent  
/ai_playground/chat  
/ai_playground/history  
/ai_playground/ideation  
/ai_playground/library  
/ai_playground/literature_review  
/ai_playground/paper_qa  
/ai_playground/paper_review  
/ai_playground/resources2UI  
/dashboard  
/dashboard/student  
/dashboard/student/courses  
/dashboard/student/notebooks  
/dashboard/student/resources  
/dashboard/teacher  
/dashboard/teacher/courses  
/dashboard/teacher/resources  
/login  
/presentation  
/register
```

LCMS: Learning Content Management System



RBAC: Admin

AI Course Platform

System Management

AI Lab

admin@example.com

Log out

Admin Panel

Manage courses, users, resources, and AI Playground limits.

Courses: 2

Deleted: 1

Users: 5

Pending teachers: 0

Suspended teachers: 0

Resources: 4

AI Usage Events: 38

AI Success: 0

AI Failed: 0

AI Success Rate: 0.0%

AI Limit: 10000

AI Usage Limit

Set the per-user usage quota for AI Playground billable requests.

Limit per user

10000

Save

Title

Hint

Label

5000

Manage Courses

Create, soft-delete, and restore courses.

Manage course enrollments.

Manage U

Create mock

testing.

AI Course Platform

System Management

AI Lab

Courses

Create, soft-delete, and restore courses.

Deleted Course Example

Teacher: teacher2@example.com

Status: open

Deleted: Yes

ML Engineering

Teacher: teacher2@example.com

Status: closed

Deleted: No

Intro to AI

Teacher: teacher@example.com

Status: open

Deleted: No

AI Course Platform

System Management

AI Lab

admin@example.com

Log out

Resources

Manage global and course-specific instructional materials.

New Resource

Basic Resources

2 total

Admin Resource (Markdown)

MARKDOWN

Edit

Delete

Teacher Resource (Link)

LINK

Edit

Delete

All Resources

4 total

Course Private Resource

MARKDOWN

Type: private_course

Course: Intro to AI

Edit

Delete

Course Public Resource

MARKDOWN

Type: public_course

Course: Intro to AI

Edit

Delete

Teacher Resource (Link)

LINK

Type: basic

Course: None

Edit

Delete

Admin Resource (Markdown)

MARKDOWN

Type: basic

Course: None

Edit

Delete

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中文版

RBAC: Teacher

AI Course Platform

Instructor WorkspaceMaterialsAI Lab

teacher@example.comLog out

Teacher Dashboard

Create and manage your classes.

Logged in as: teacher@example.comNew Class

Intro to AI

Status: open1 Enrolled1 Pending

A starter course for the AI course platform.

Manage StudentsEditClose

AI Course Platform

Instructor WorkspaceMaterialsAI Lab

teacher@example.com

My Resources

Create and manage your course materials.

New

All Materials

Course Private Resource

MARKDOWNCourse: Intro to AI

Edit

Course Public Resource

MARKDOWNCourse: Intro to AI

Edit

Teacher Resource (Link)

LINKCourse: None

Edit

AI Course Platform

Instructor WorkspaceMaterialsAI Lab

teacher@example.comLog out

← Back to classes

New Class

Title

Description

Status

open

AI Course Platform

Instructor WorkspaceMaterialsAI Lab

teacher@example.comLog out

← Back to resources

New Resource

Title

Resource type

private_course

Format type

markdown

Course Optional

None

Markdown Content

Title

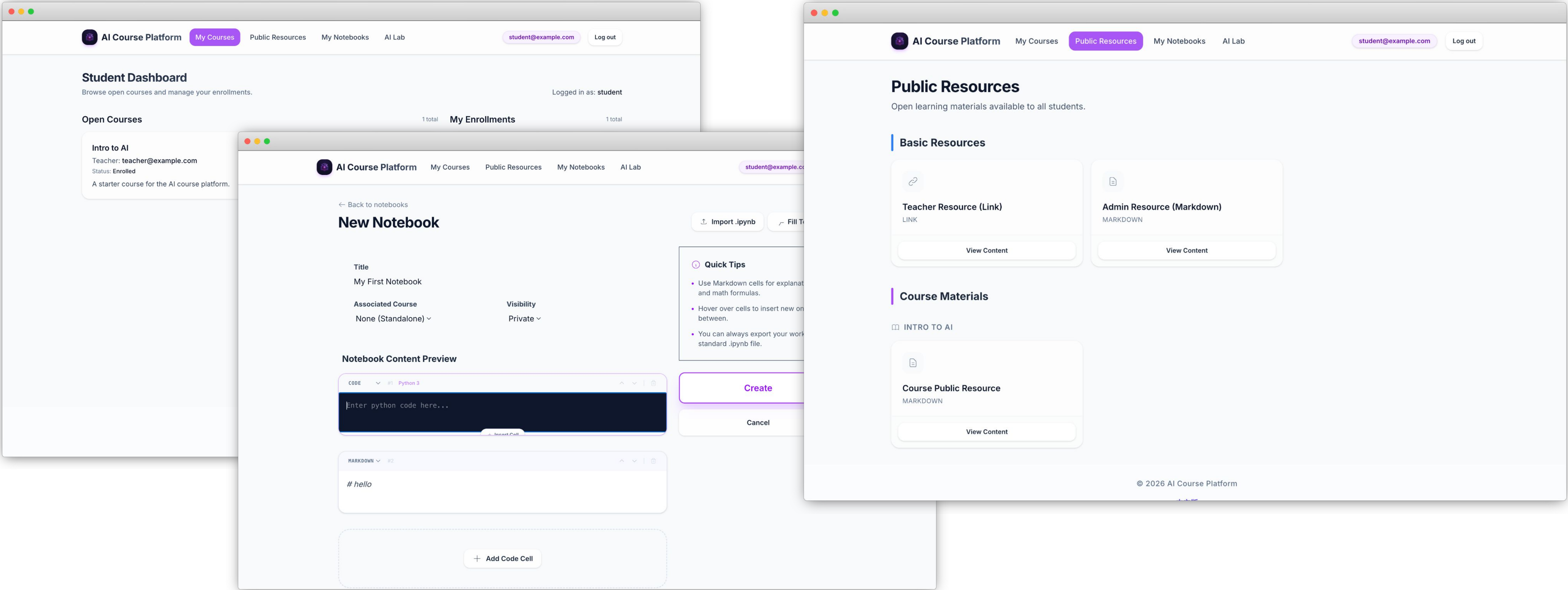
Content here...

CancelCreate

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中文版

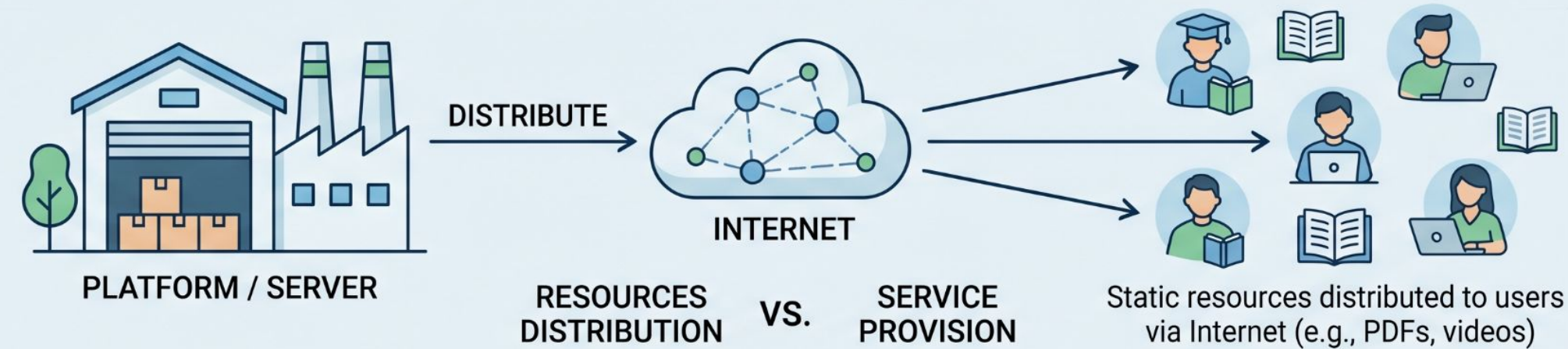
RBAC: Student



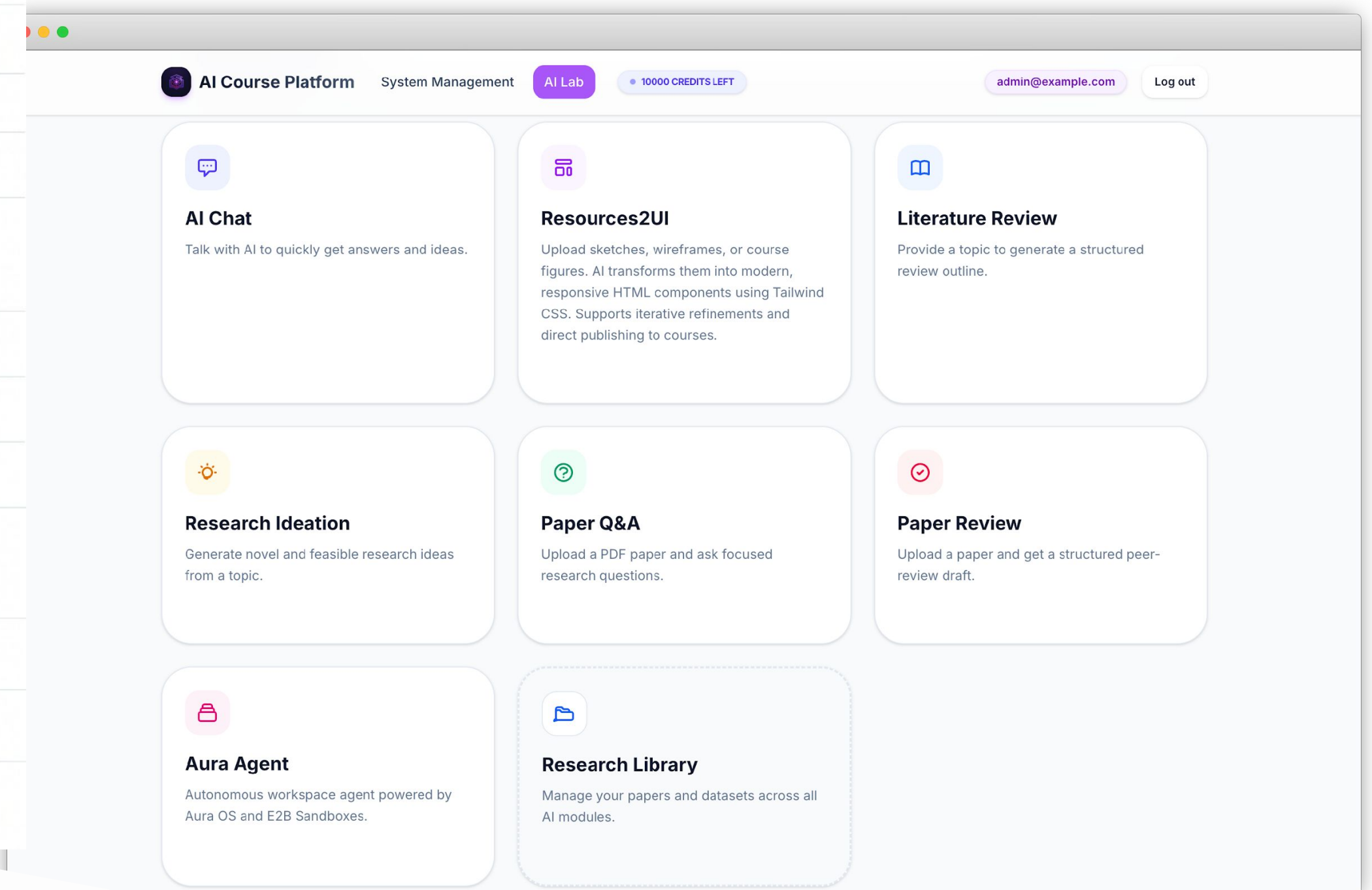
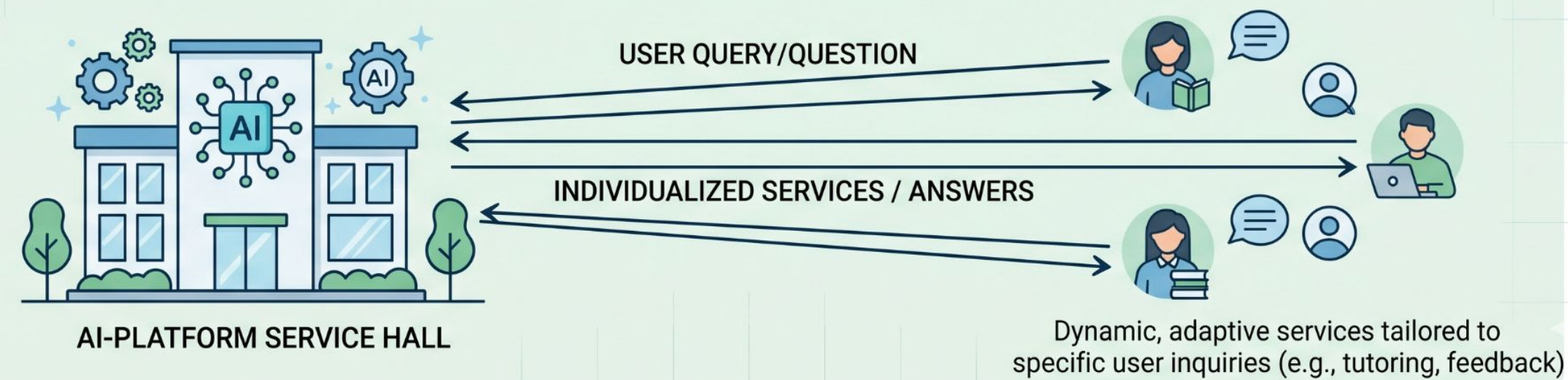
LSMS: Learning Service Management System

EDUCATIONAL SOFTWARE PLATFORM EVOLUTION: FROM RESOURCE DISTRIBUTION TO SERVICE-ORIENTED AI

TRADITIONAL COURSE PLATFORM: RESOURCE DISTRIBUTION HUB



AI-POWERED PLATFORM: SERVICE-ORIENTED "SERVICE HALL"



Course Platform

Sci-Agent-hub

A2learn

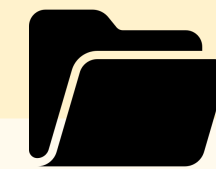
Aura OS

Customize toolkits for Scientific Research

Tool layer



ShellCommand



FileSystemTool



UnpallwallTool

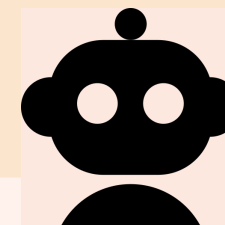


SemanticTool

LLM layer



call_llm



call_agent



call_parrallel_agent



call_parrellel_search

Multi-agent Layer



Ideation



Literature_review



Paper_review

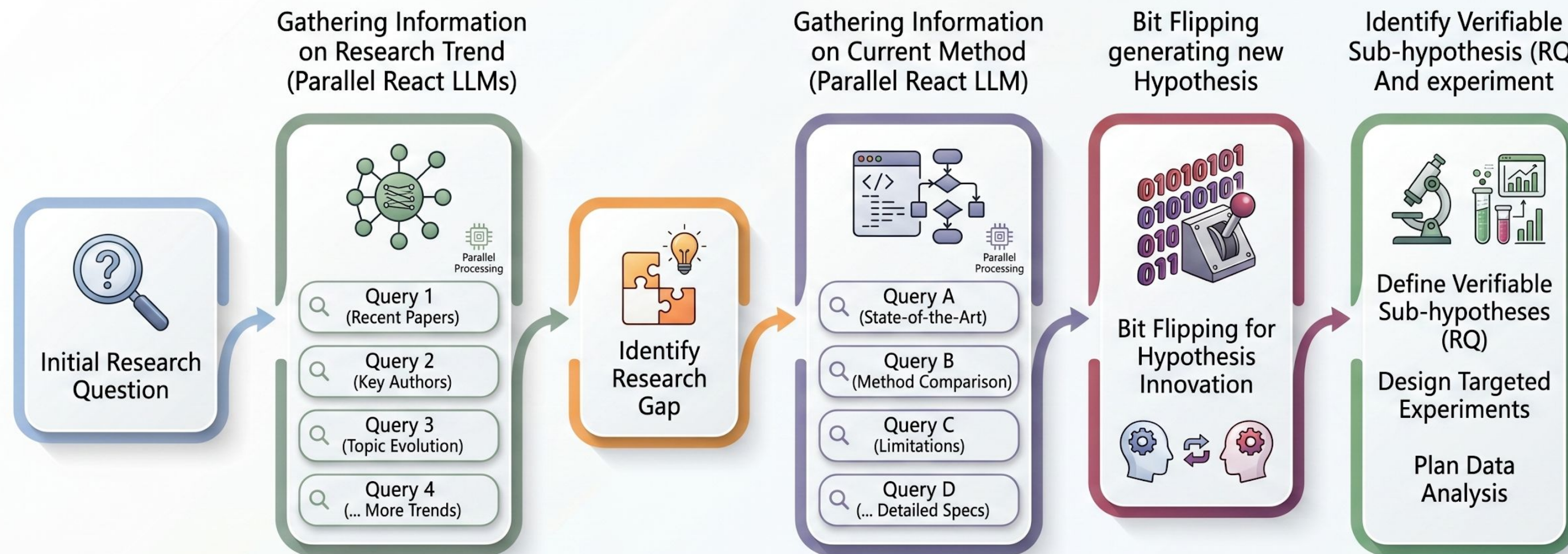


PaperQA

Stream Output

Ideation Pipeline

Ideation



AI Service Layer

AI Course Platform

My CoursesPublic ResourcesMy NotebooksAI Lab

9995 CREDITS LEFT

student@example.com

Log out

Settings

TOPIC

Intersection of Blockcha

Generate

RECENT SESSIONS

Intersection of Blockchain and Supp5/26/2026

Intersection of Blockchain and Supp5/26/2026

Intersection of Blockchain and Supp5/26/2026

Ideation Result

CopySave

Ideation Report

Research Proposal: Hybrid Sustainability Blockchain Framework for Scalable, Energy-Efficient Supply Chain Management

Problem Statement

The intersection of blockchain and supply chain sustainability presents a critical challenge in reconciling decentralization's environmental costs with its potential for transparent, accountable systems. While blockchain has shown promise in enhancing traceability and reducing fraud (Zhang et al., 2021), its energy-intensive consensus mechanisms (e.g., proof-of-work) and lack of standardized sustainability metrics undermine its ecological benefits (Kamal et al., 2022). Current solutions are fragmented, with limited empirical evidence quantifying carbon footprint reductions or socioeconomic impacts (Geissdoerfer et al., 2020).

Hybrid Sustainability Blockchain (HSB) framework driven metrics, and inclusive governance to achiev

Background

Foundational Methods and Recent Advances

Blockchain applications in supply chains have prim

Ask a follow-up question...

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中文版Thesis Defense (HTML)Thesis De

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student@example.com

Log out

Back to AI Lab

Research Library

Your persistent repository for research papers and data files.

Upload File

563_Automated_Design_of_Agenti.pdf541 KBMay 26, 2026

842_AutoFigure_Generating_and_.pdf10.7 MBMay 26, 2026

221503015-朱辰-毕业论文.pdf1.55 MBMay 26, 2026

No tags

Add tags (comma separated)

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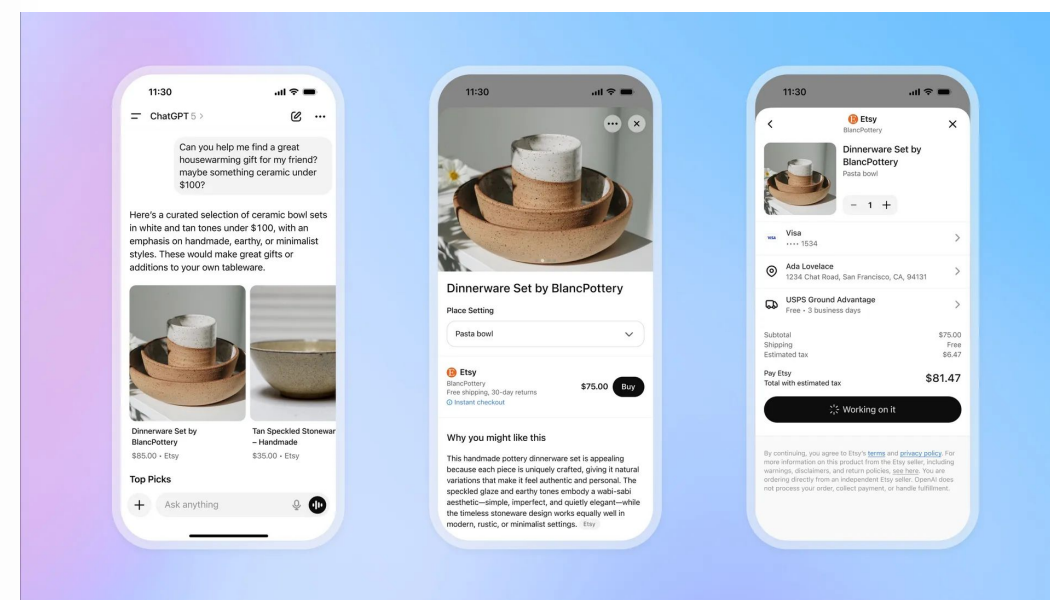
Three Ways for Generative UI with ai agent

Controlled GenUI

- useComponent as a tool

1. Pre-built Components
2. High Predictability

Openai Shopping
ACP
MCP Apps



千问买奶茶

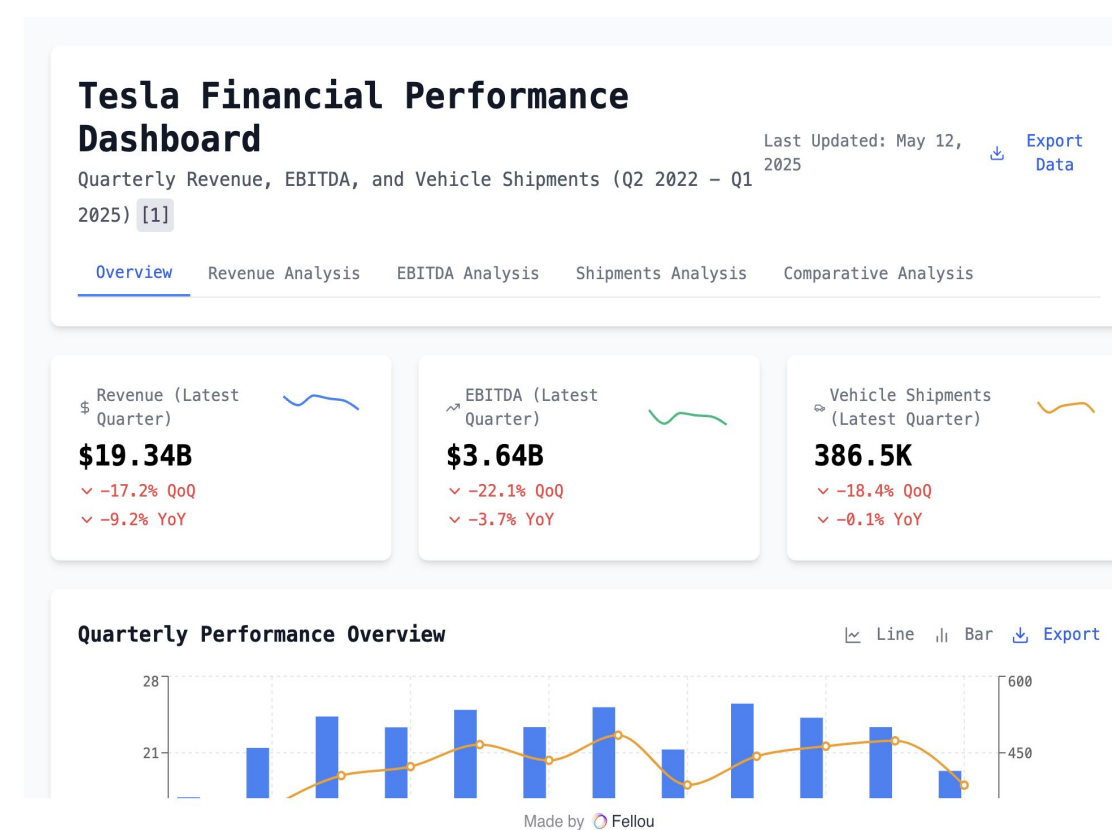


Declarative GenUI

- Agent - DOM - UI

1. Schema-Driven
2. Balanced Flexibility
3. Dynamic Adaptation

Fellow.ai



Open GenUI

- AI agent Generate html and run in sandbox

1. Code-on-the-Fly
2. Ultimate Flexibility
3. Design & Security Risks

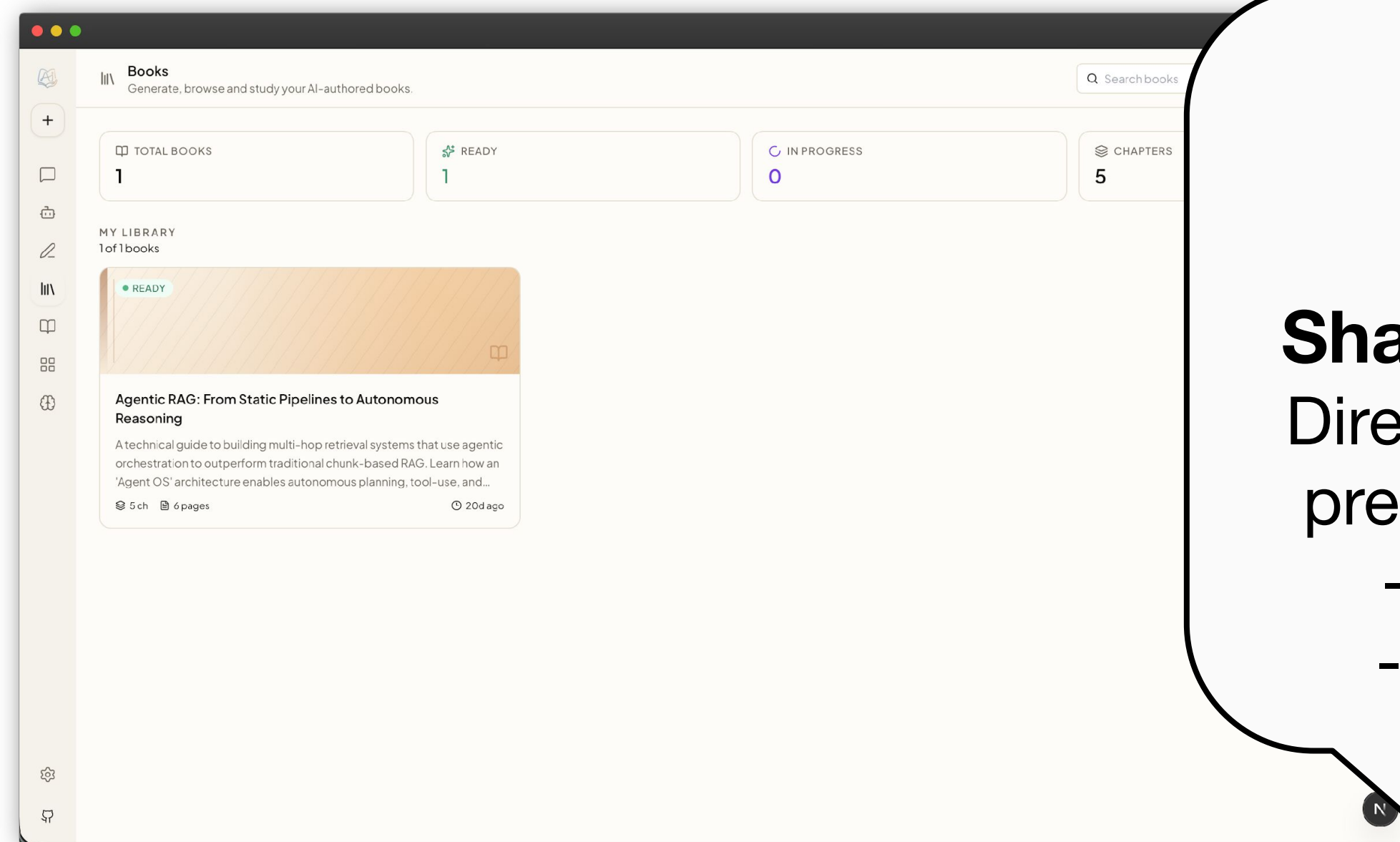
Generate UI for application



Current Method in Interactive Learning Material Generation— Open GenUI

DeepTutor

Interactive Book Mode

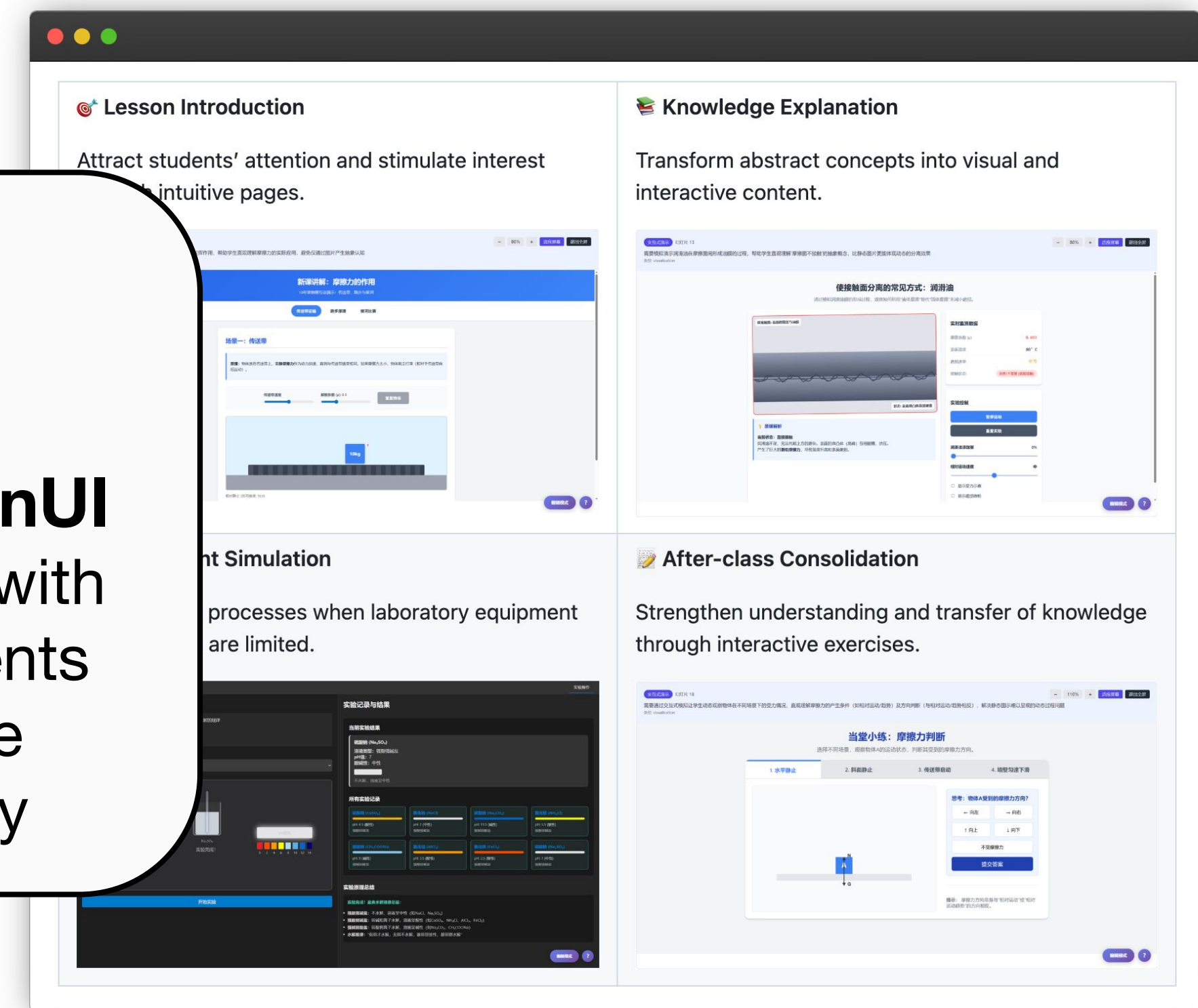


HTML

Shared Open GenUI
Directly write html with
pre-built components

- Uncontrollable
- Hard to Modify

OpenMAIC

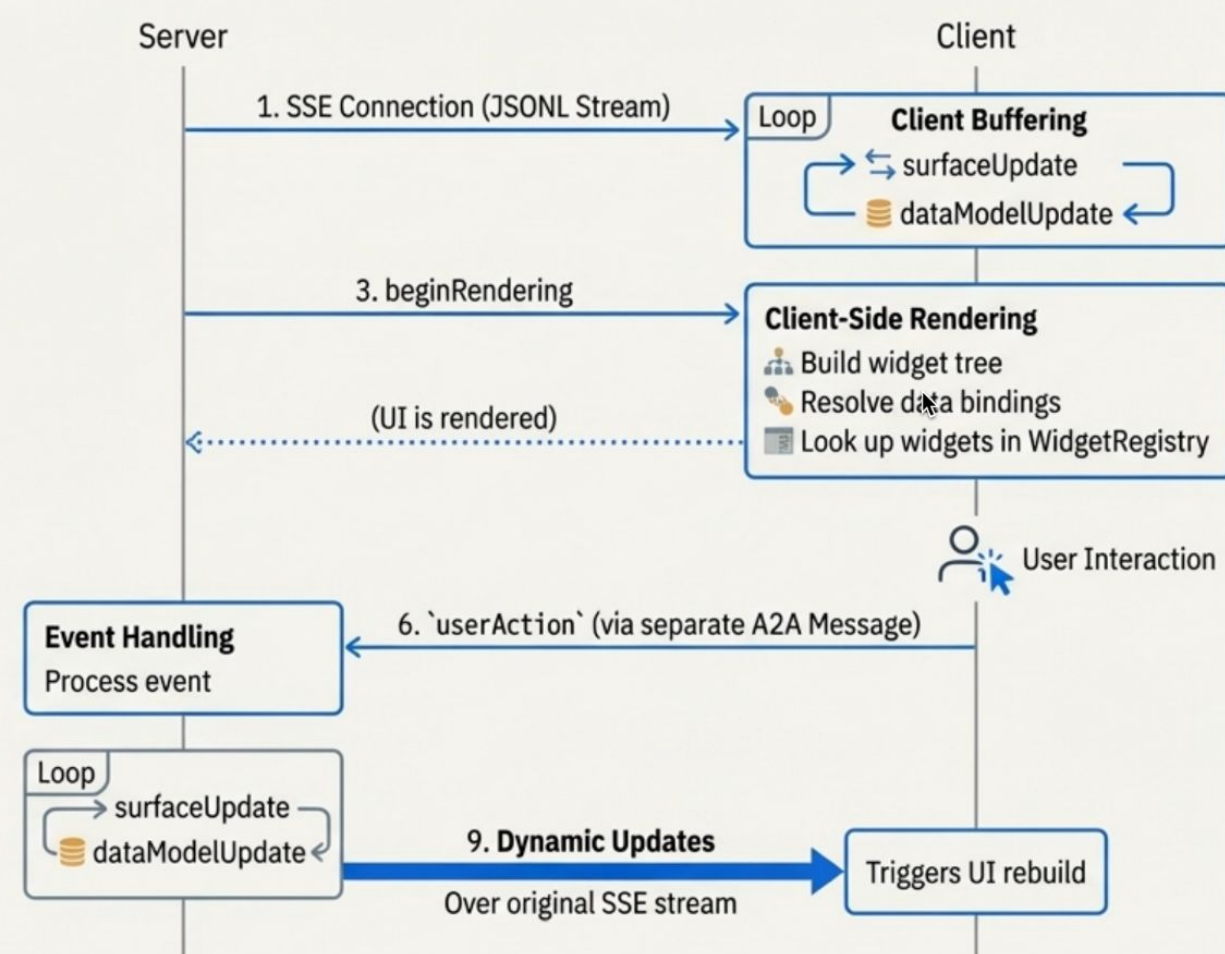


Google's A2UI Protocol

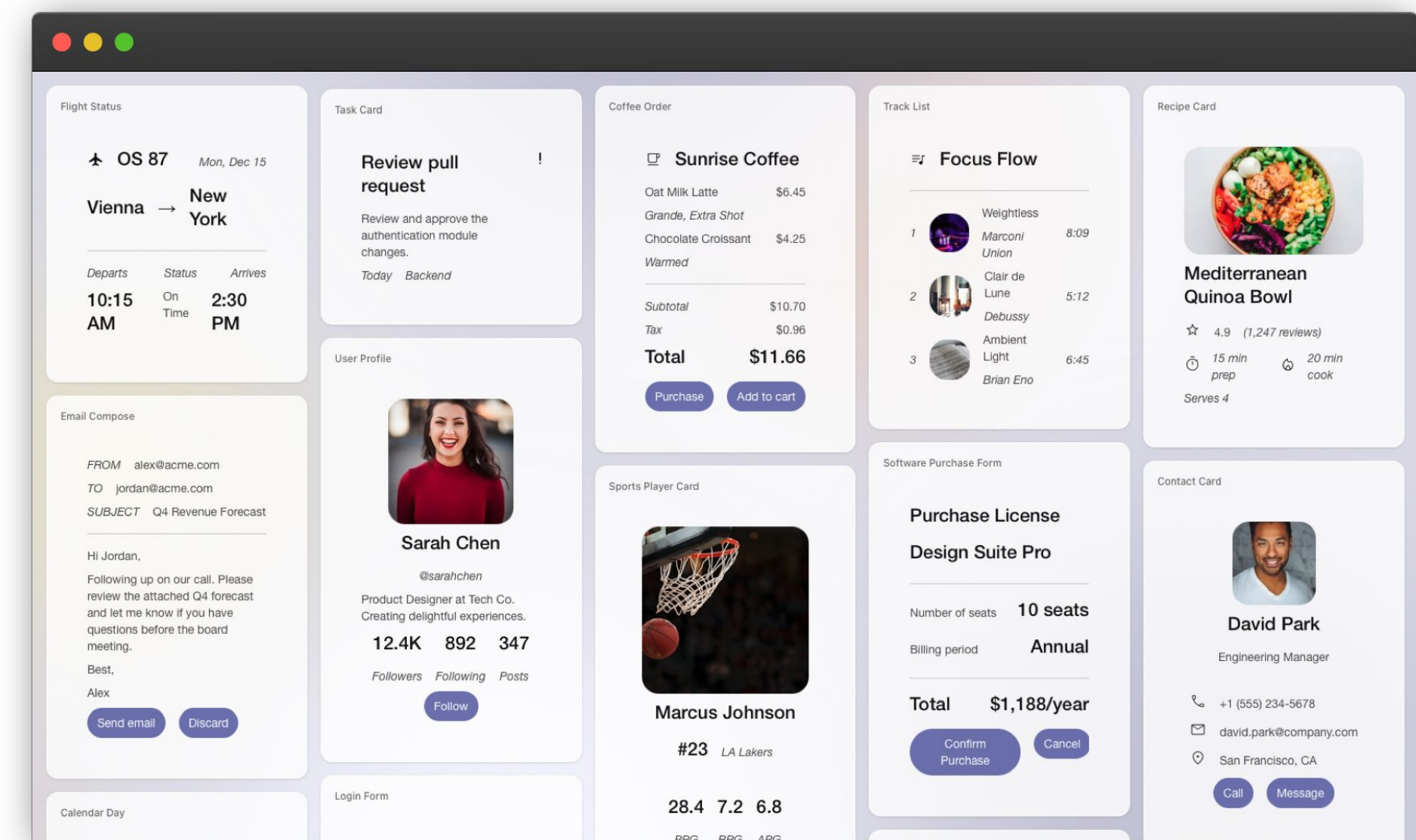
1. **A2UI** uses a declarative JSON format with a flat adjacency list structure, making it highly optimized for LLMs to generate UI components incrementally without error-prone tree nesting.
2. The protocol strictly decouples UI components from application data, enabling efficient, real-time data binding and streaming progressive rendering via JSONL or SSE.
3. By restricting AI agents to a pre-approved native widget catalog instead of executable code, **A2UI** ensures cross-platform look-and-feel while eliminating the security risks of arbitrary code execution.

The End-to-End Data Flow

1. **Server Stream:** Server sends a JSONL stream over Server-Sent Events (SSE).
2. **Client Buffering:** Client parses messages, storing component definitions ('surfaceUpdate') and building the data model ('dataModelUpdate').
3. **Render Signal:** Server sends 'beginRendering'. This explicit signal prevents a flash of incomplete content.
4. **Client-Side Rendering:** Client recursively walks the component tree from the root, resolves data bindings, and instantiates native widgets from its Widget Registry.
5. **User Interaction:** User clicks a button. Client constructs a 'userAction' payload.
6. **Event Handling:** 'userAction' is sent to the server via a separate A2A message.
7. **Dynamic Updates:** Server processes the event and sends new 'surfaceUpdate' or 'dataModelUpdate' messages over the original SSE stream to update the UI.



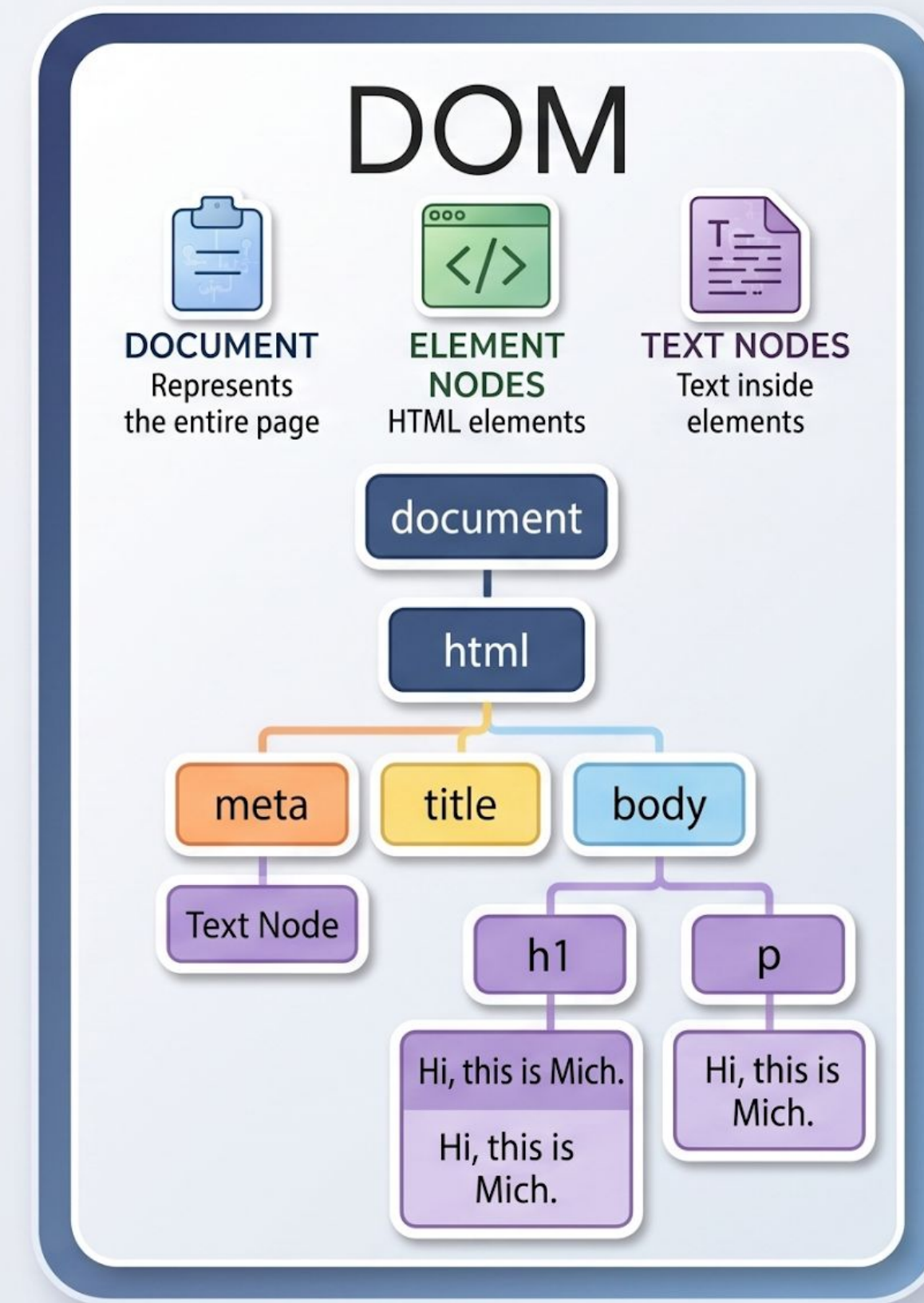
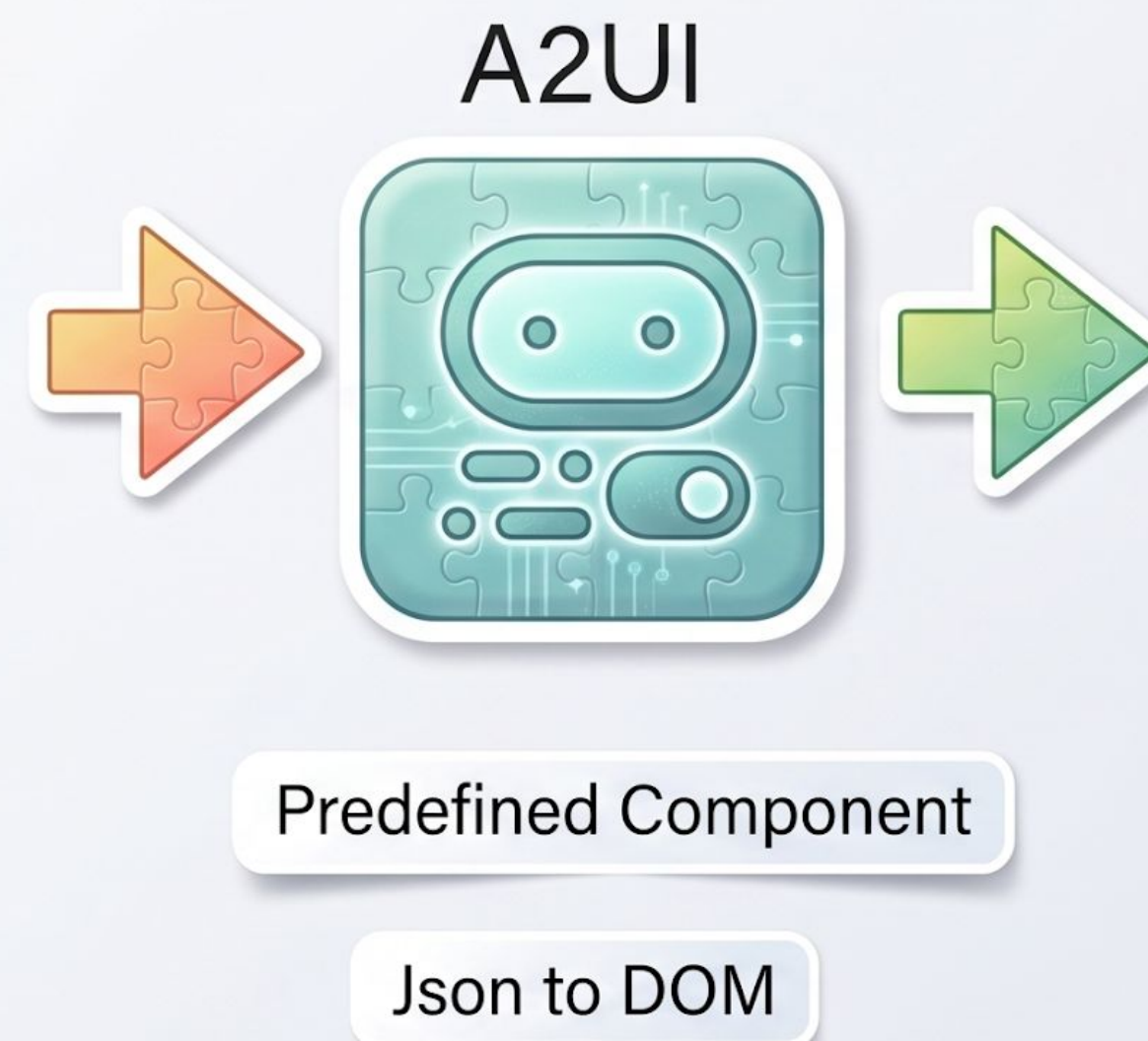
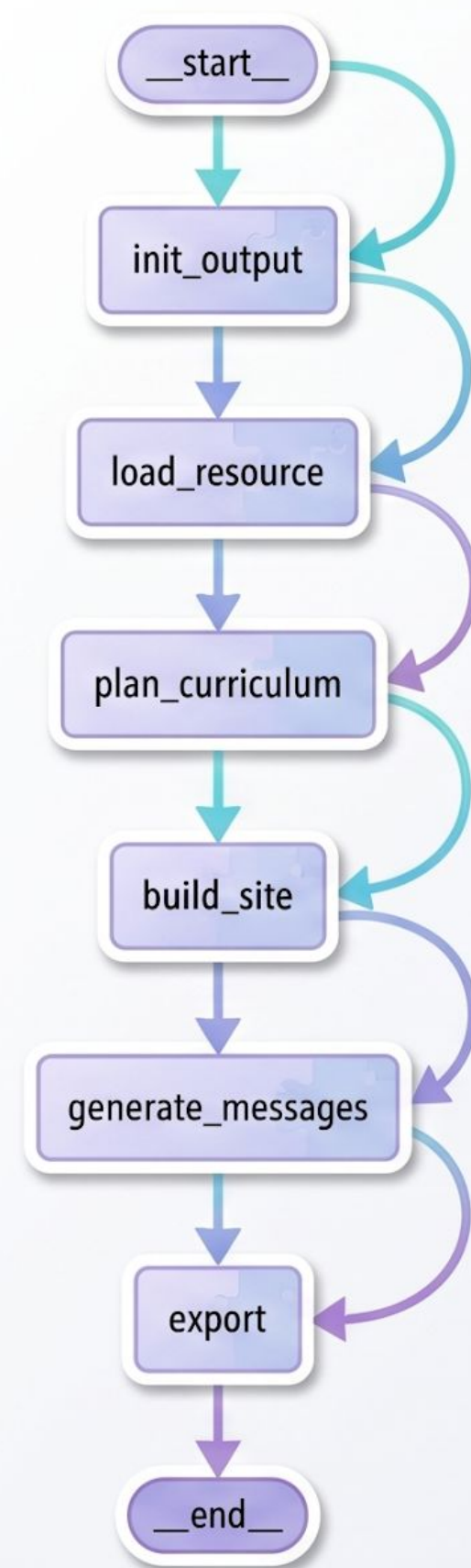
A2UI Framework



Predefined Component Gallery

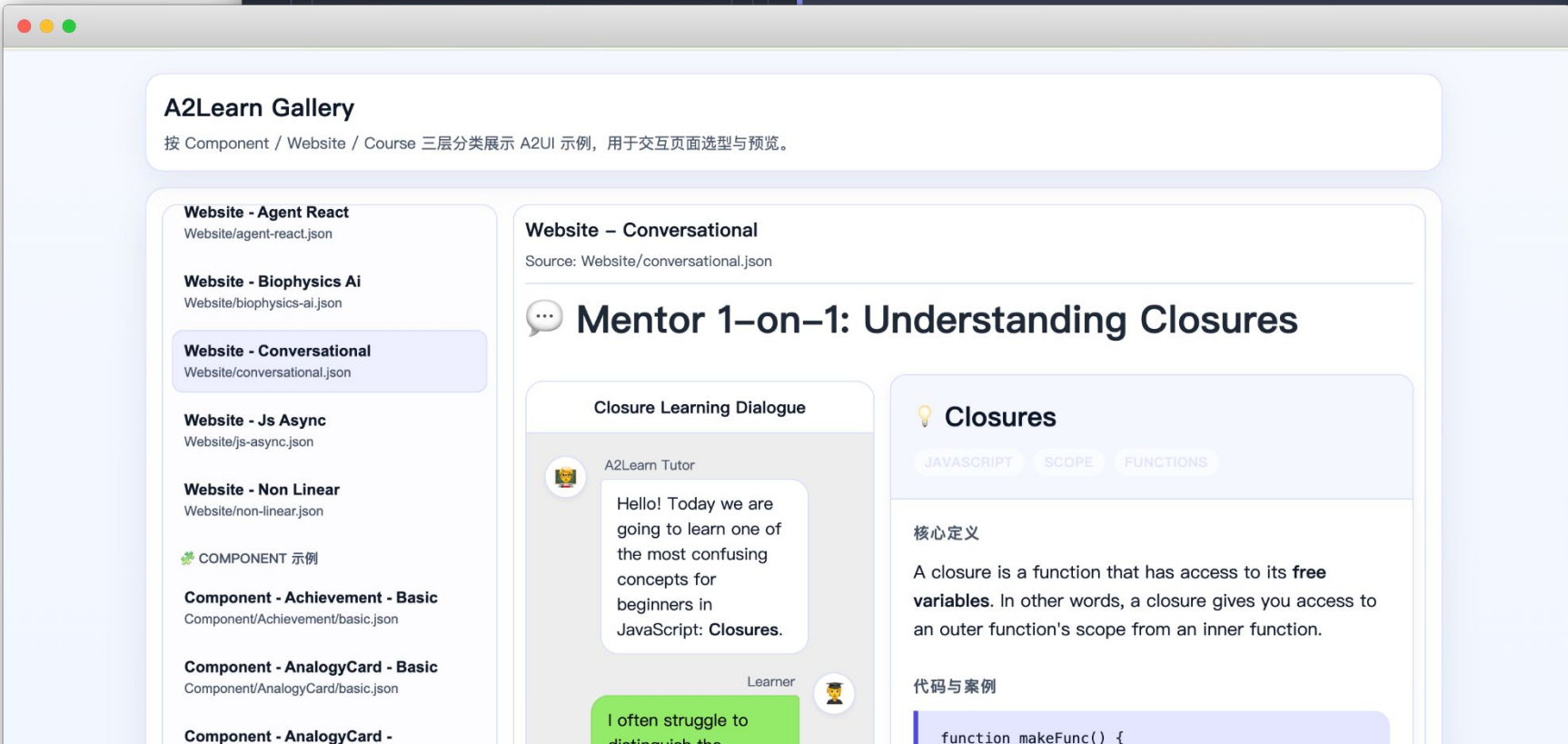
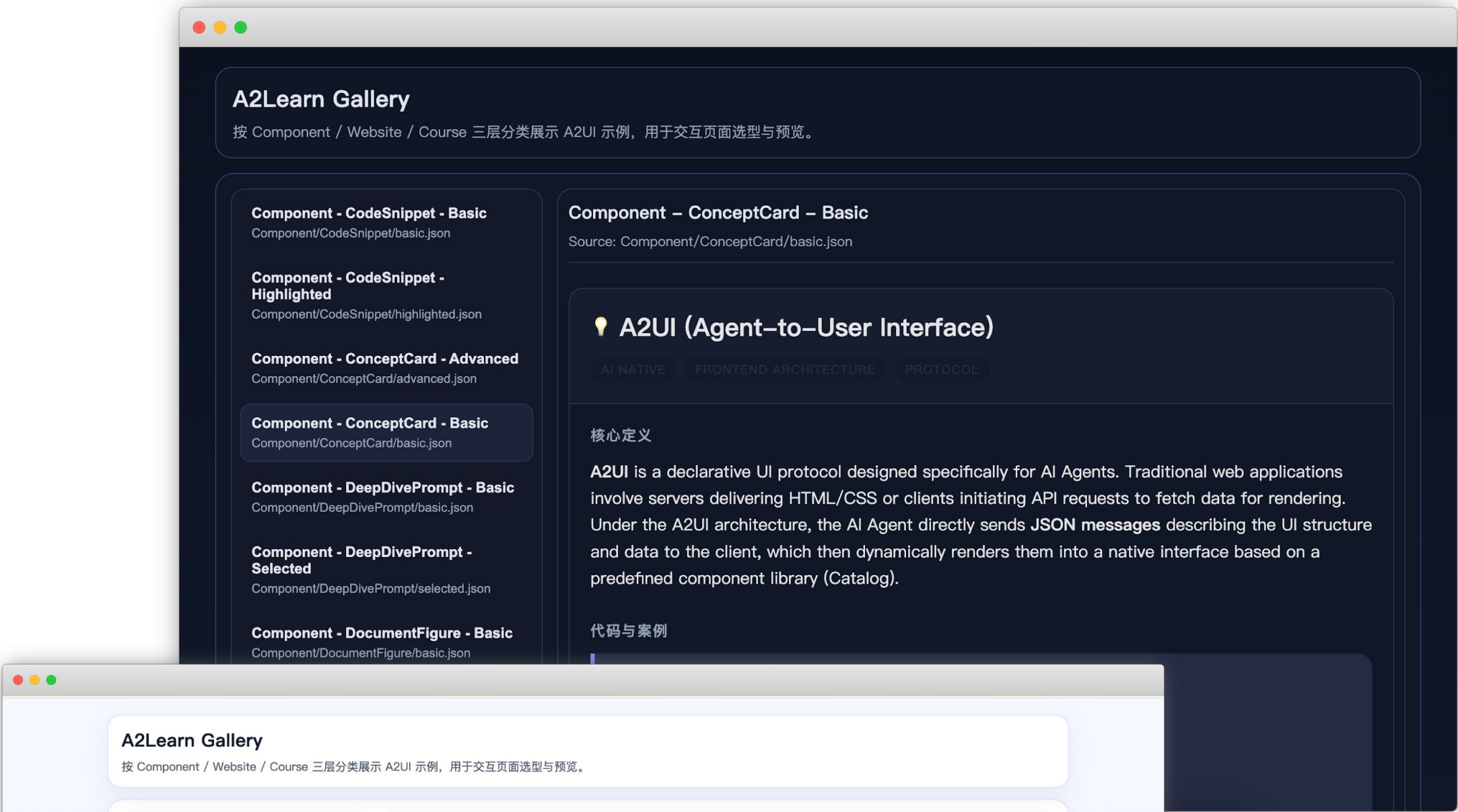
A2Learn Pipeline

Just in time(JIT): UpdateComponent

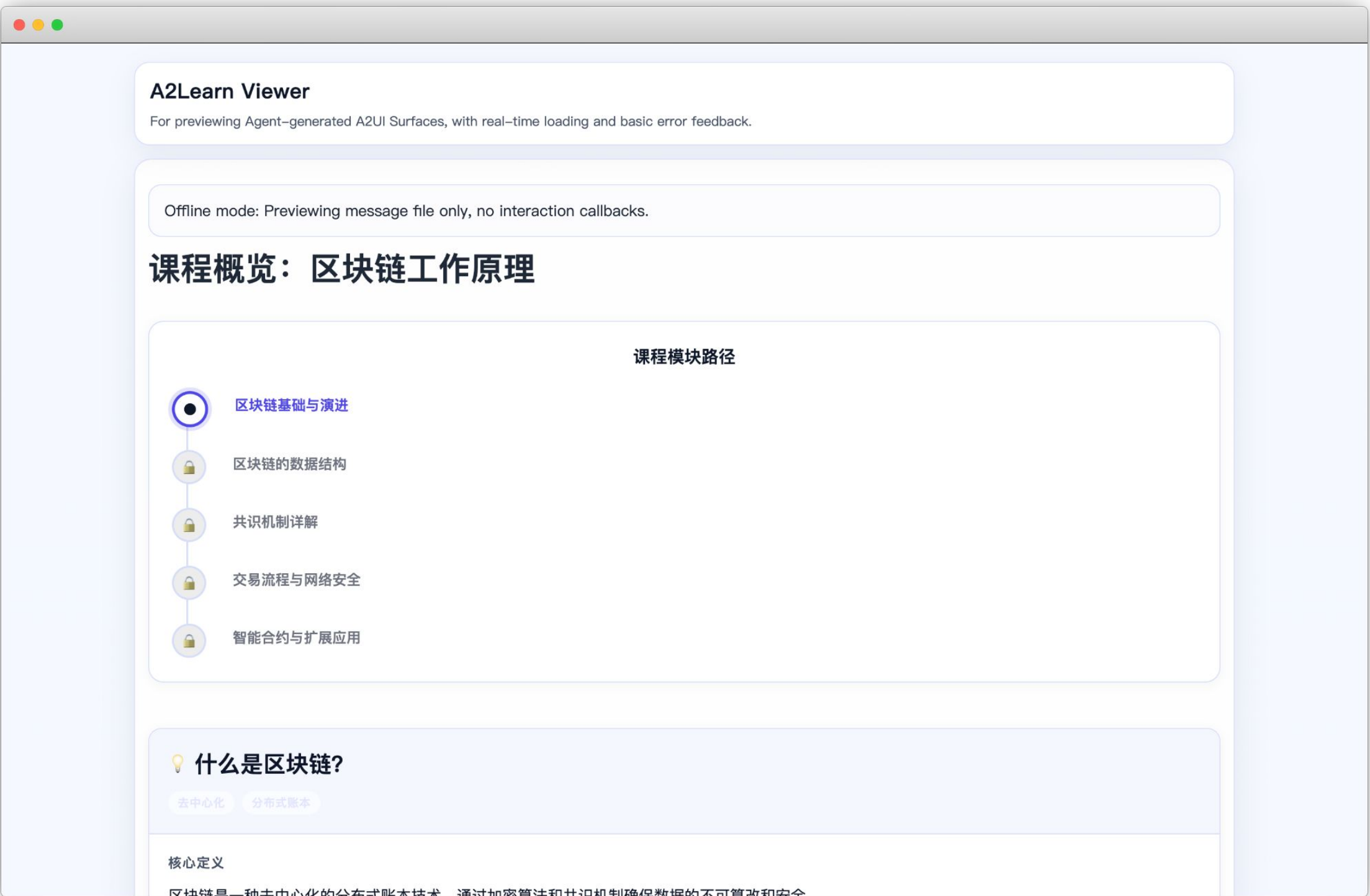


A2Learn Pipeline

Gallery for Component

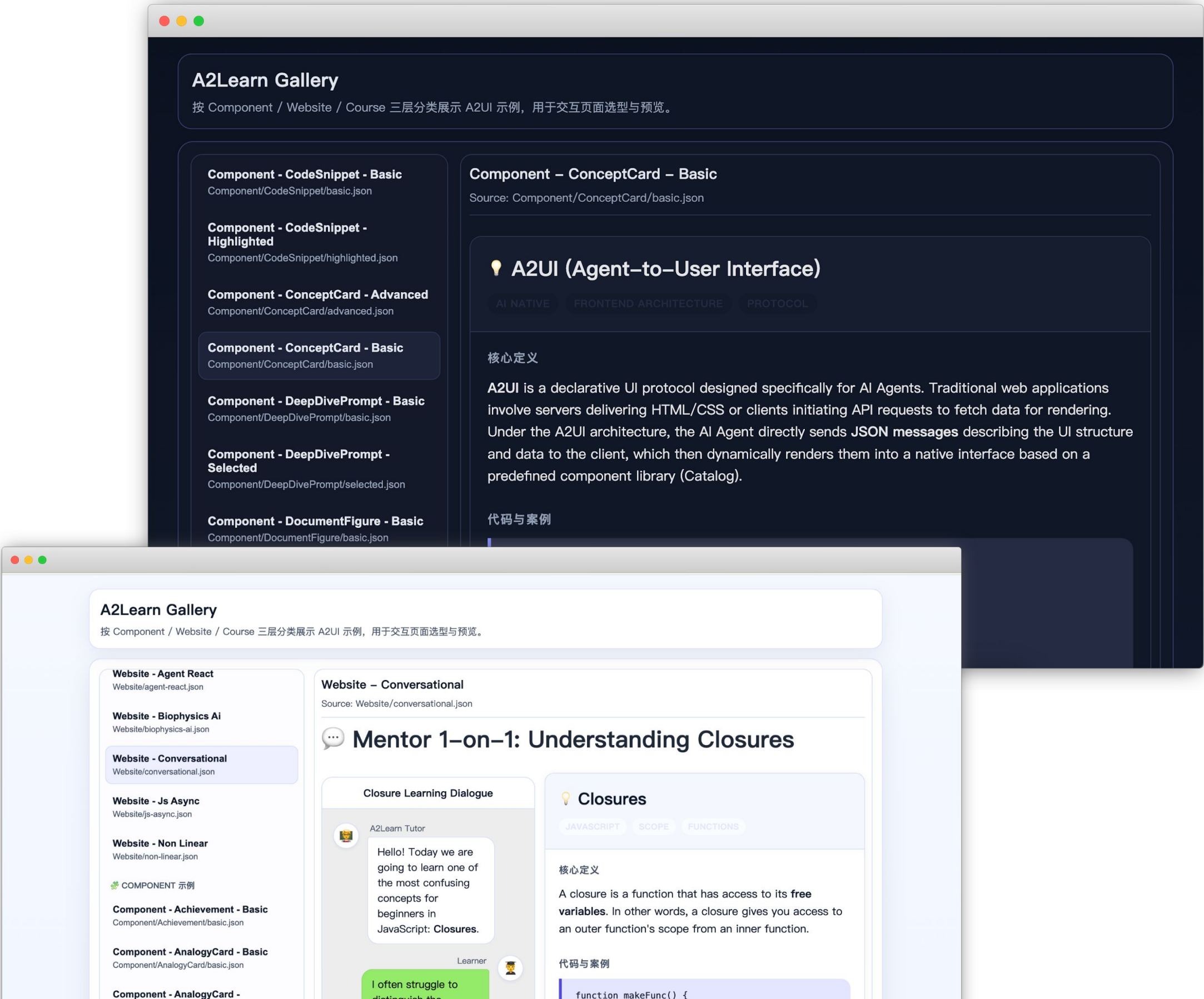


```
(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```



A2Learn Pipeline

Gallery for Component



```
(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```



核心定义

区块链是一种去中心化的分布式账本技术，通过加密算法和共识机制确保数据的不可篡改和安全。

代码与案例

以比特币为例，每个区块包含前一个区块的哈希值，形成链式结构。

关联探索

比特币 →

以太坊 →

初识区块链小测验

以下哪项是区块链的核心特征？

☐ 中心化存储

☐ 不可篡改

☐ 免费使用

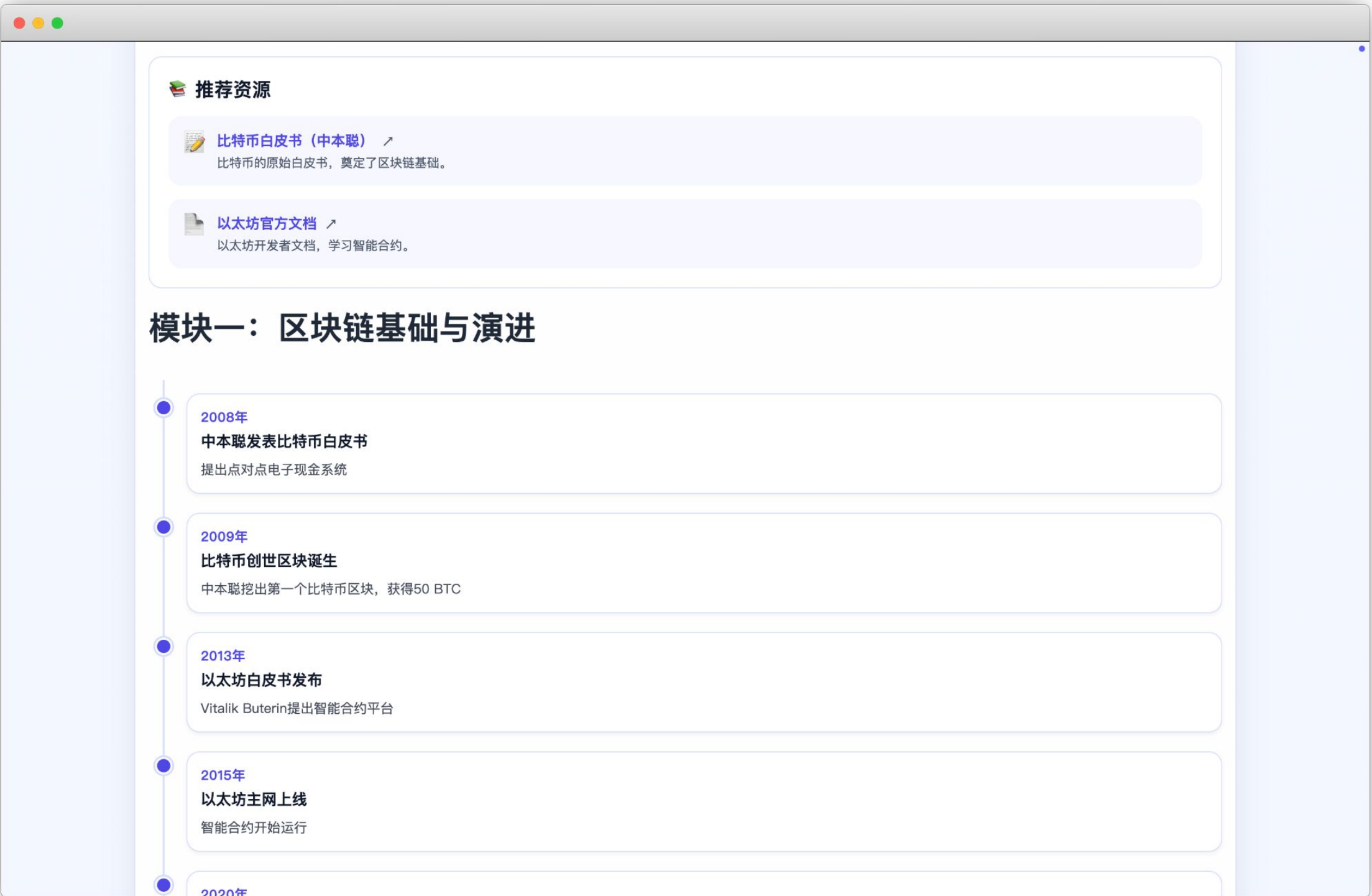
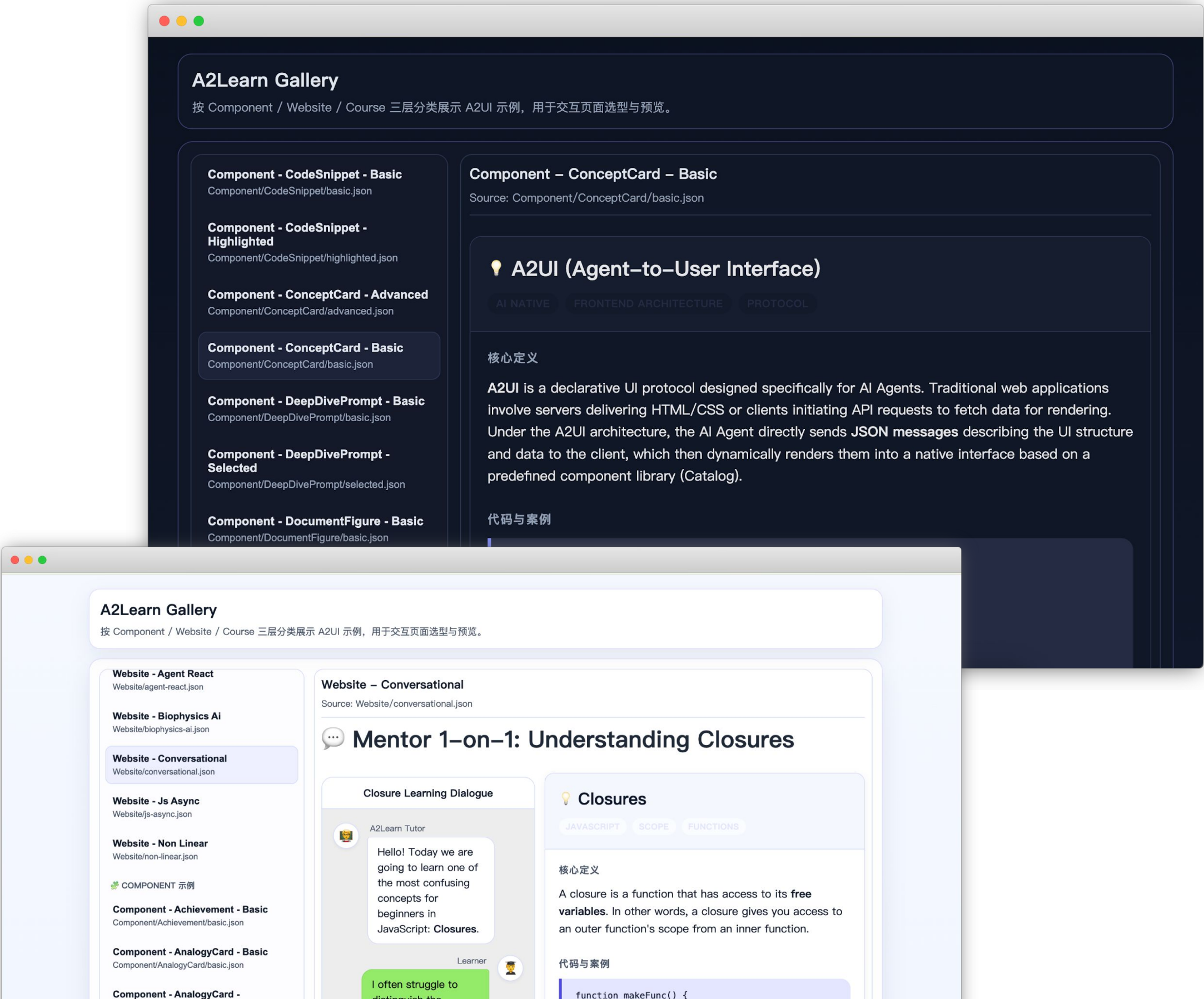
☐ 无加密

提交答案

A2Learn Pipeline

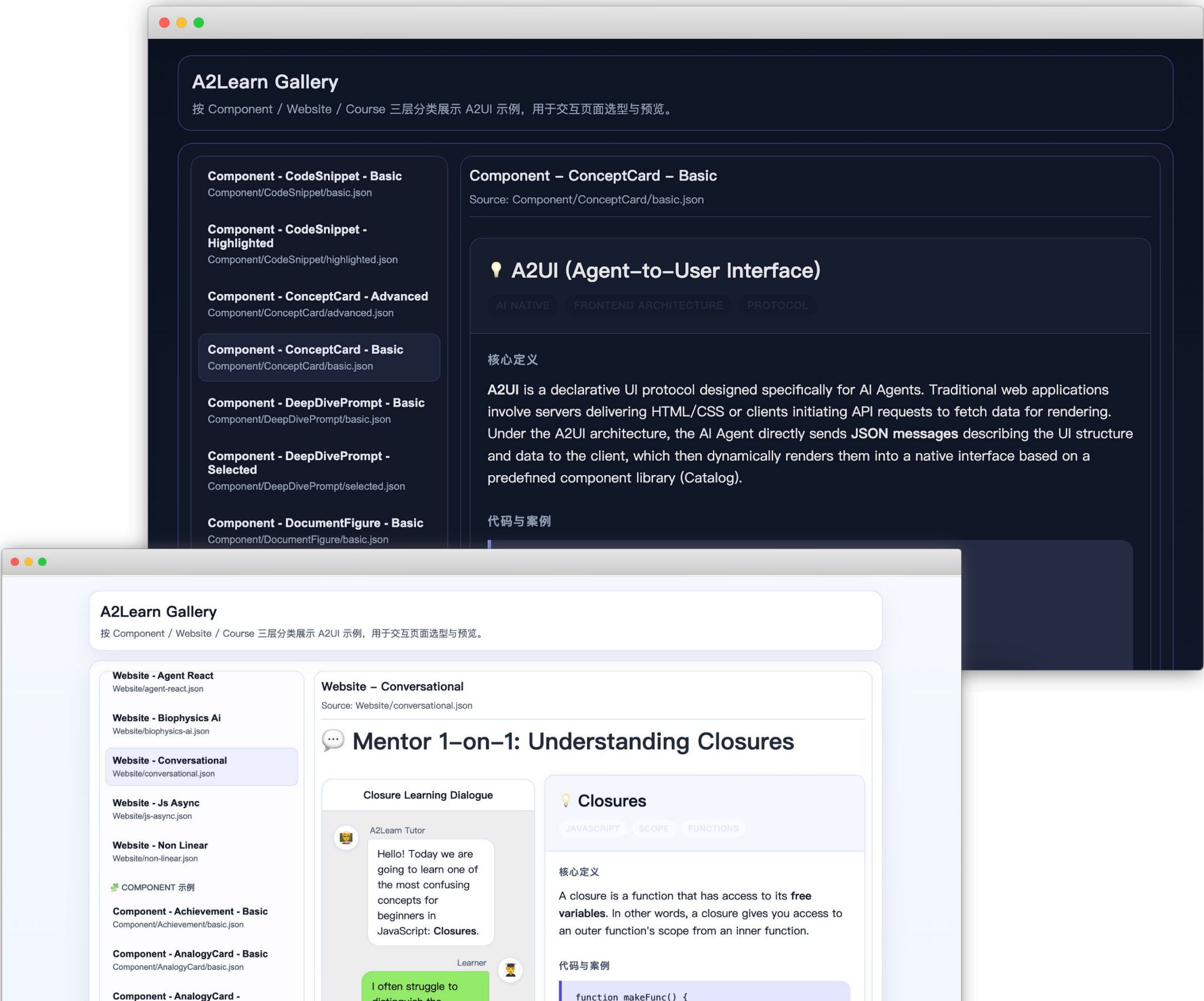
Gallery for Component

```
(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
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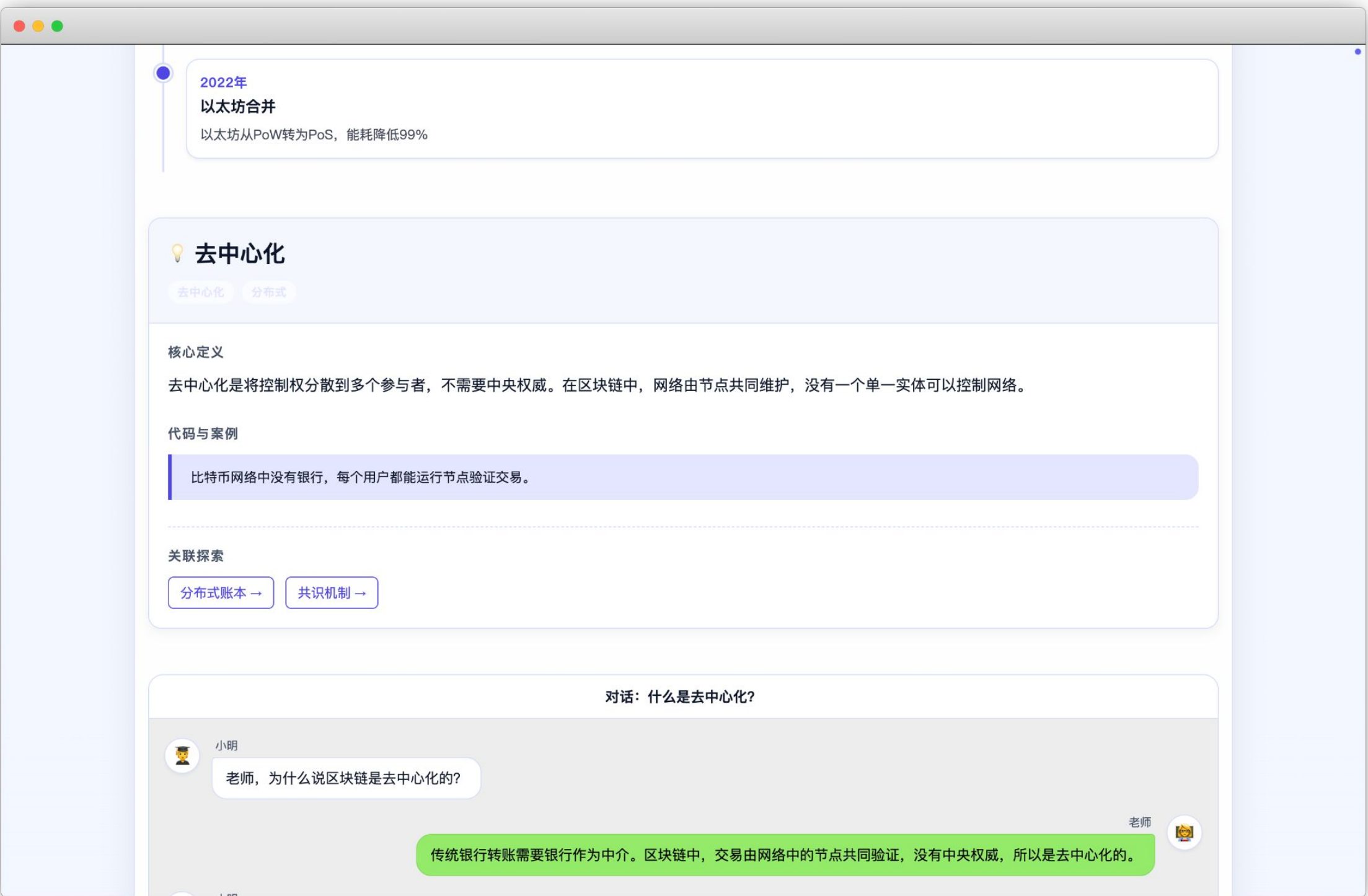


A2Learn Pipeline

Gallery for Component

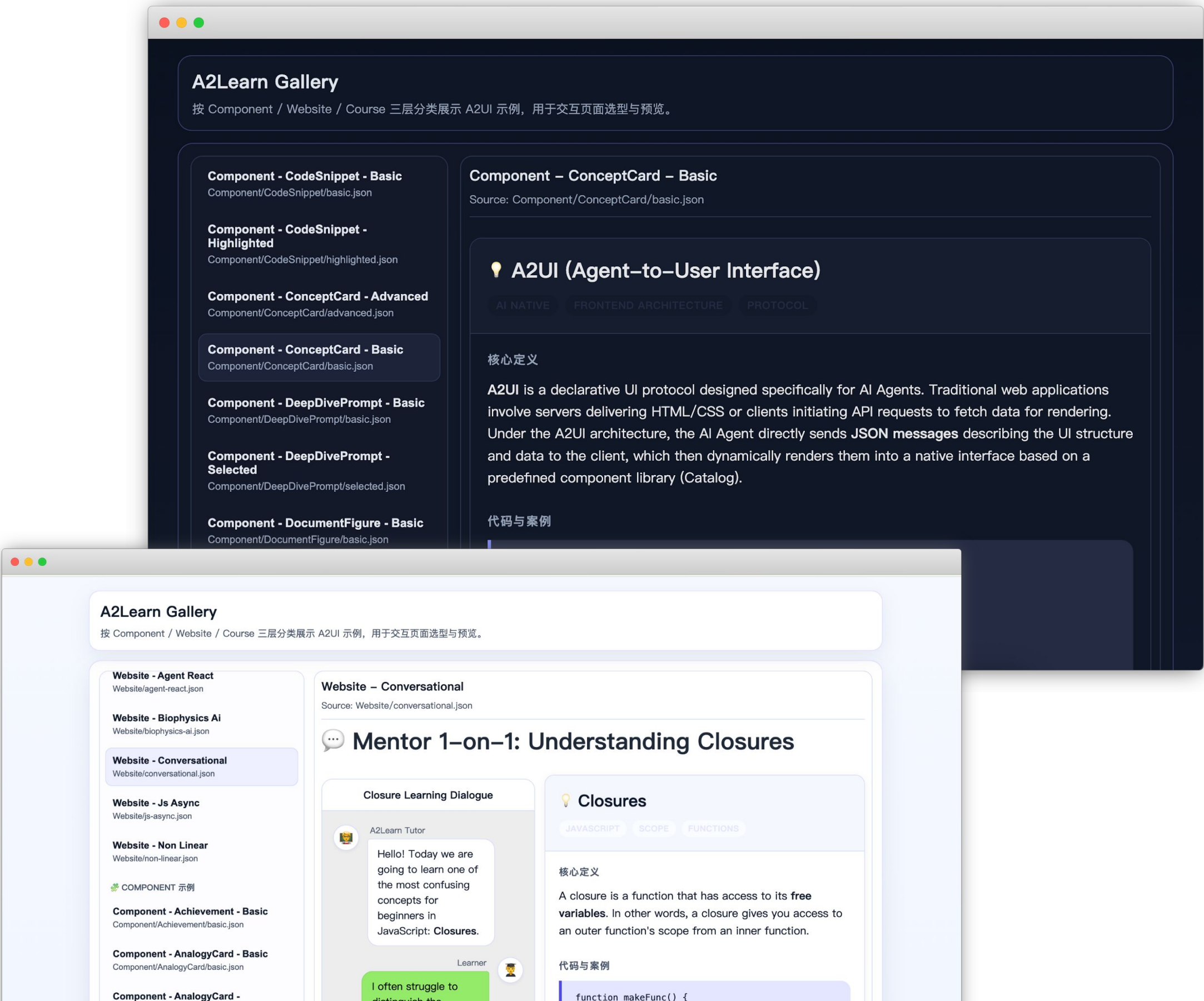


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(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```



A2Learn Pipeline

Gallery for Component

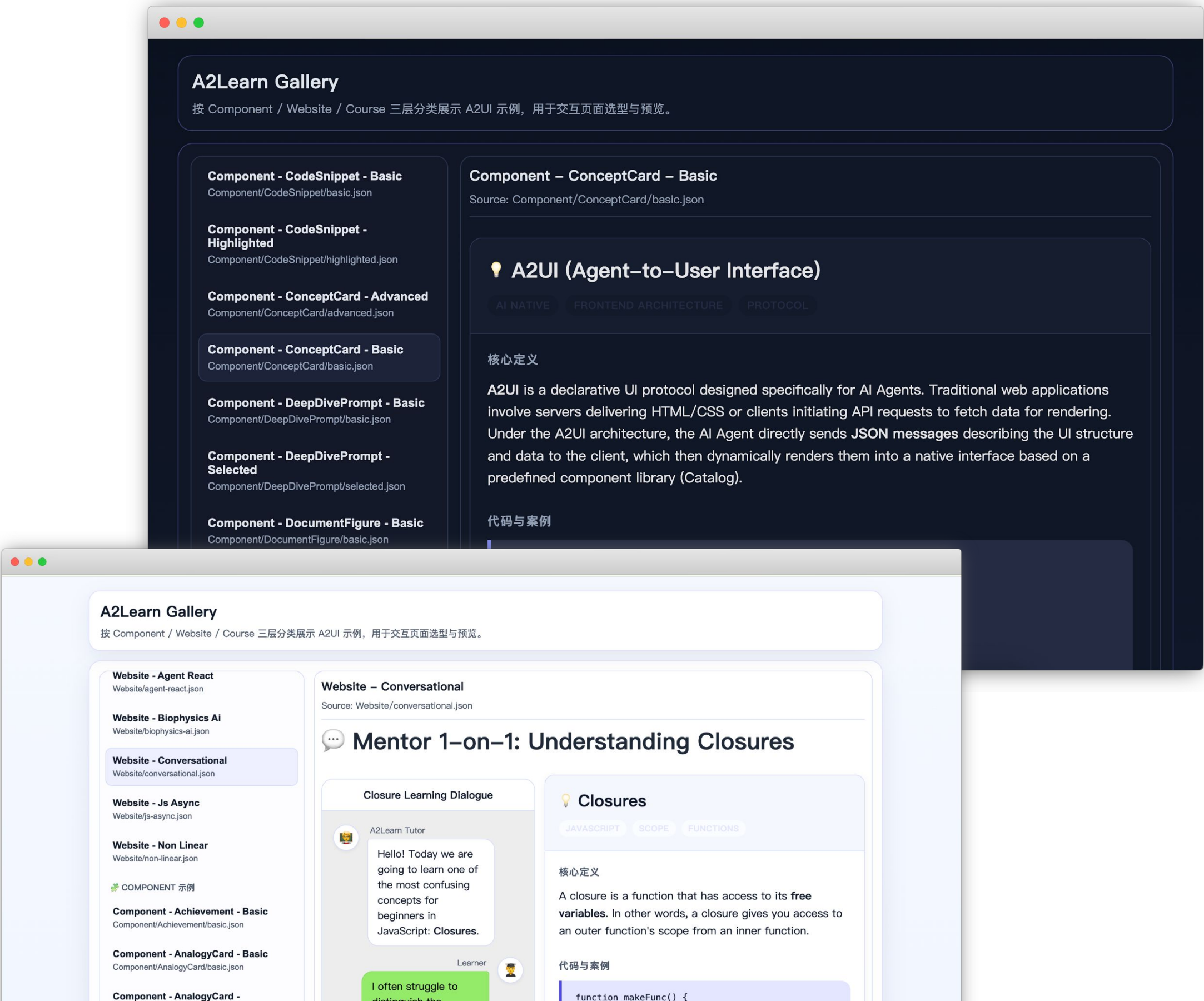


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```

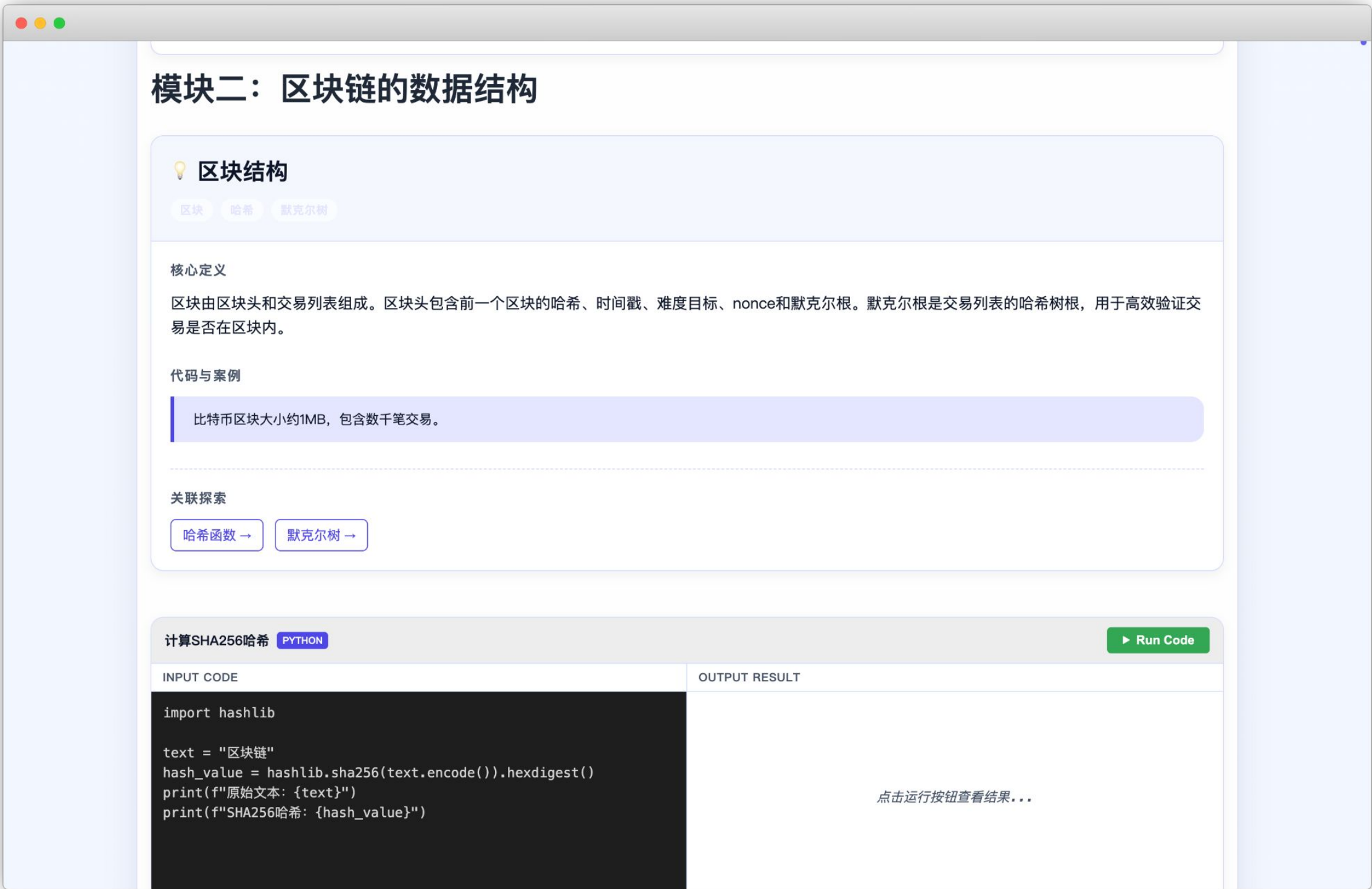


A2Learn Pipeline

Gallery for Component

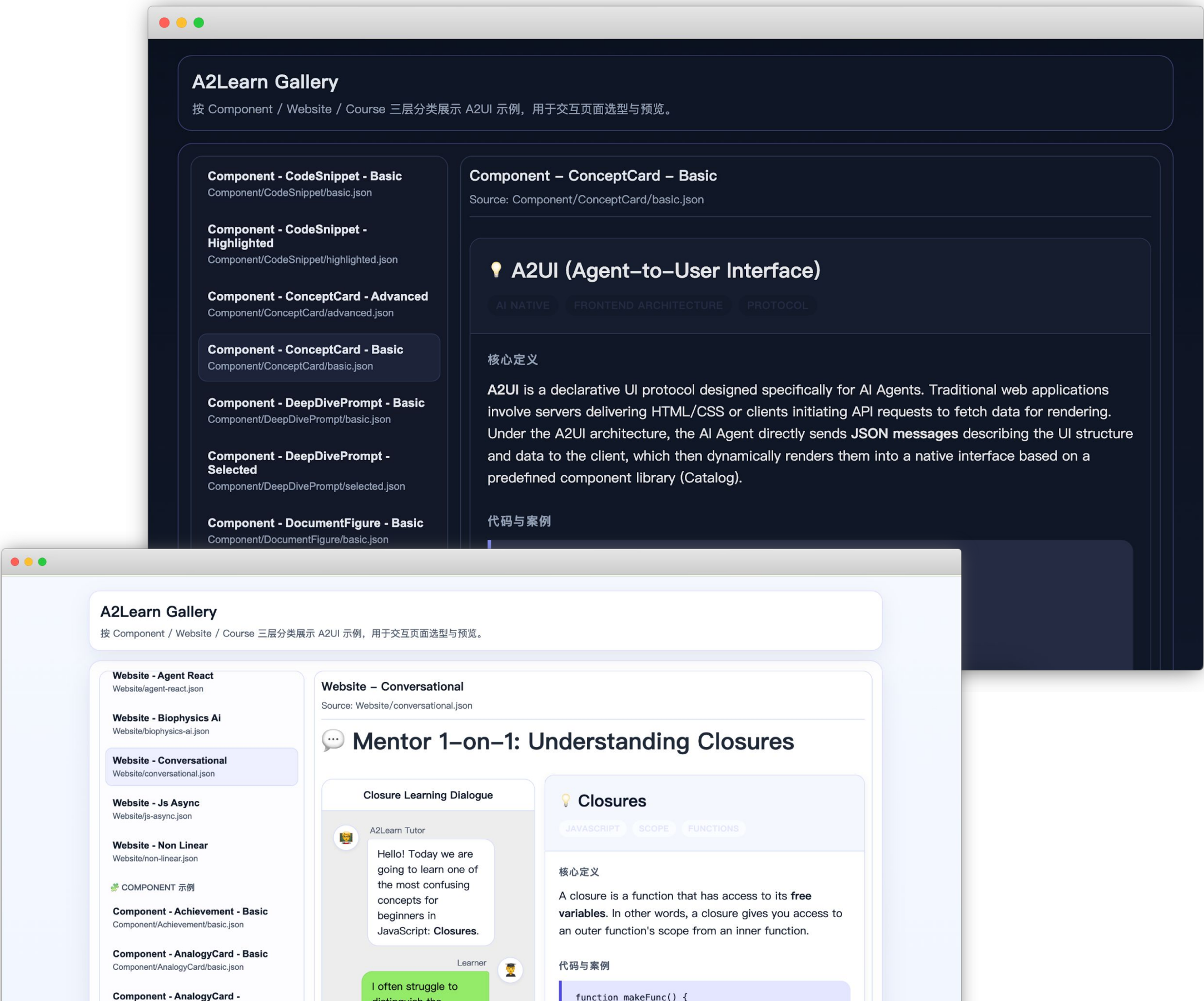


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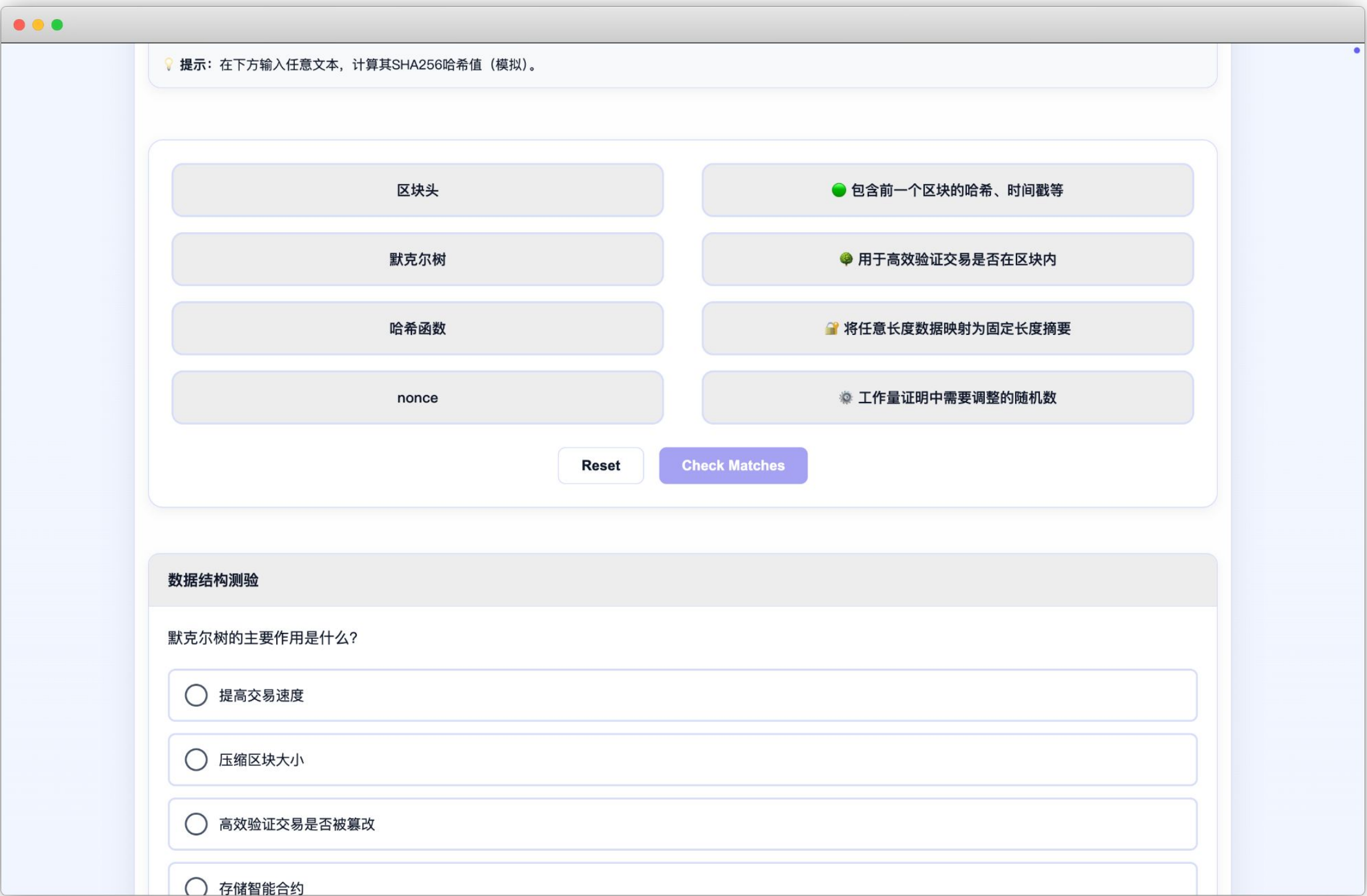


A2Learn Pipeline

Gallery for Component

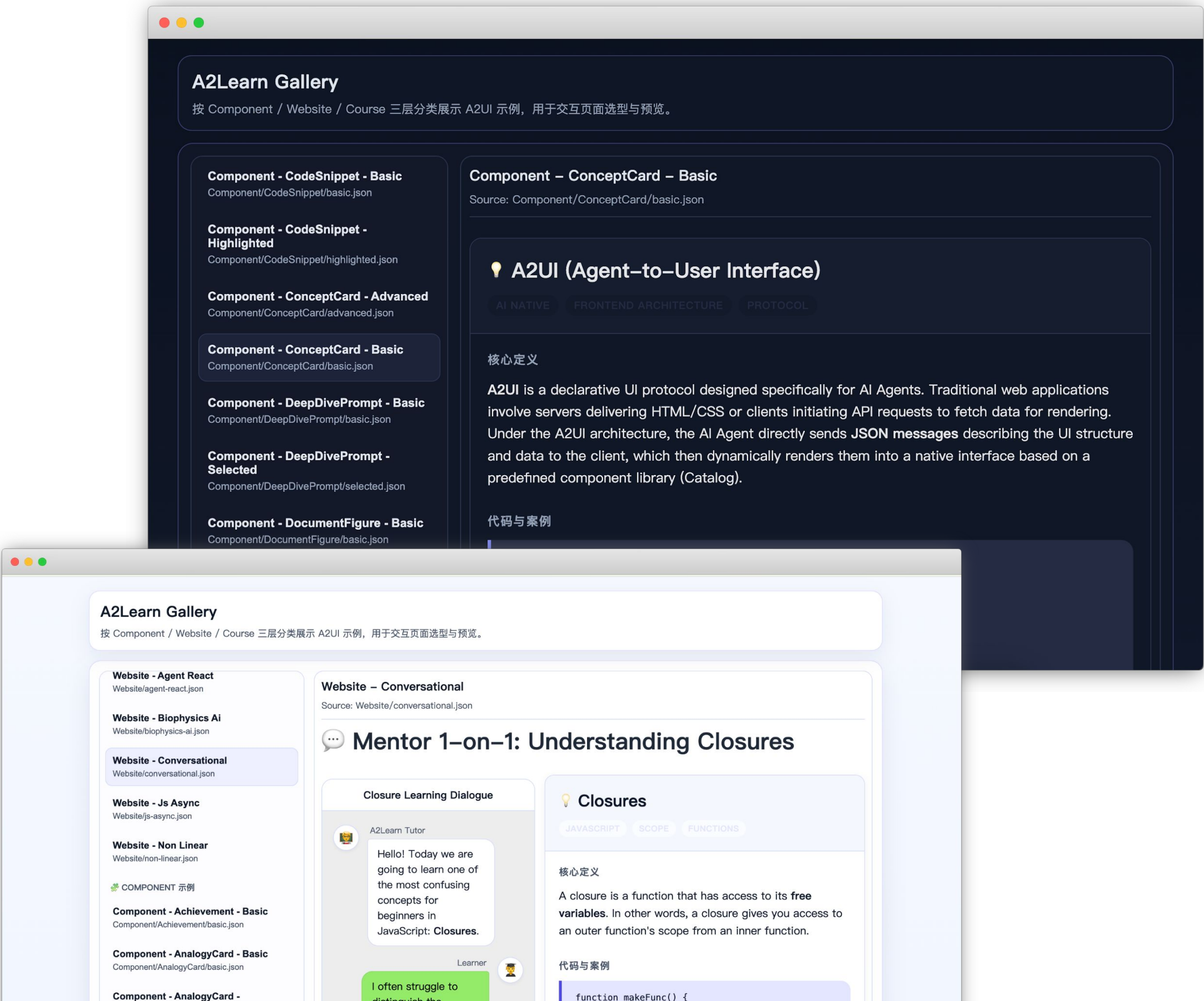


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(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
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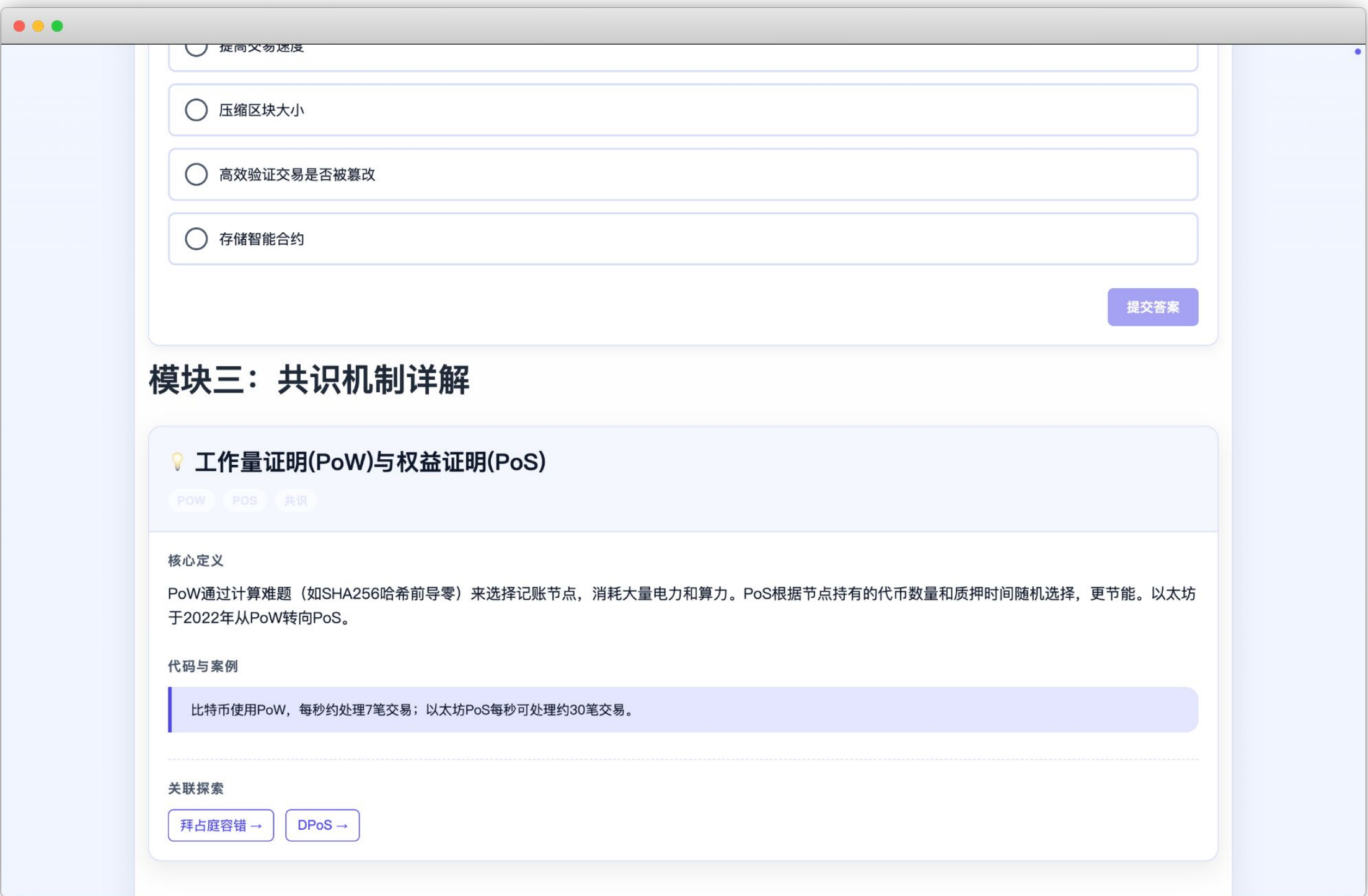


A2Learn Pipeline

Gallery for Component

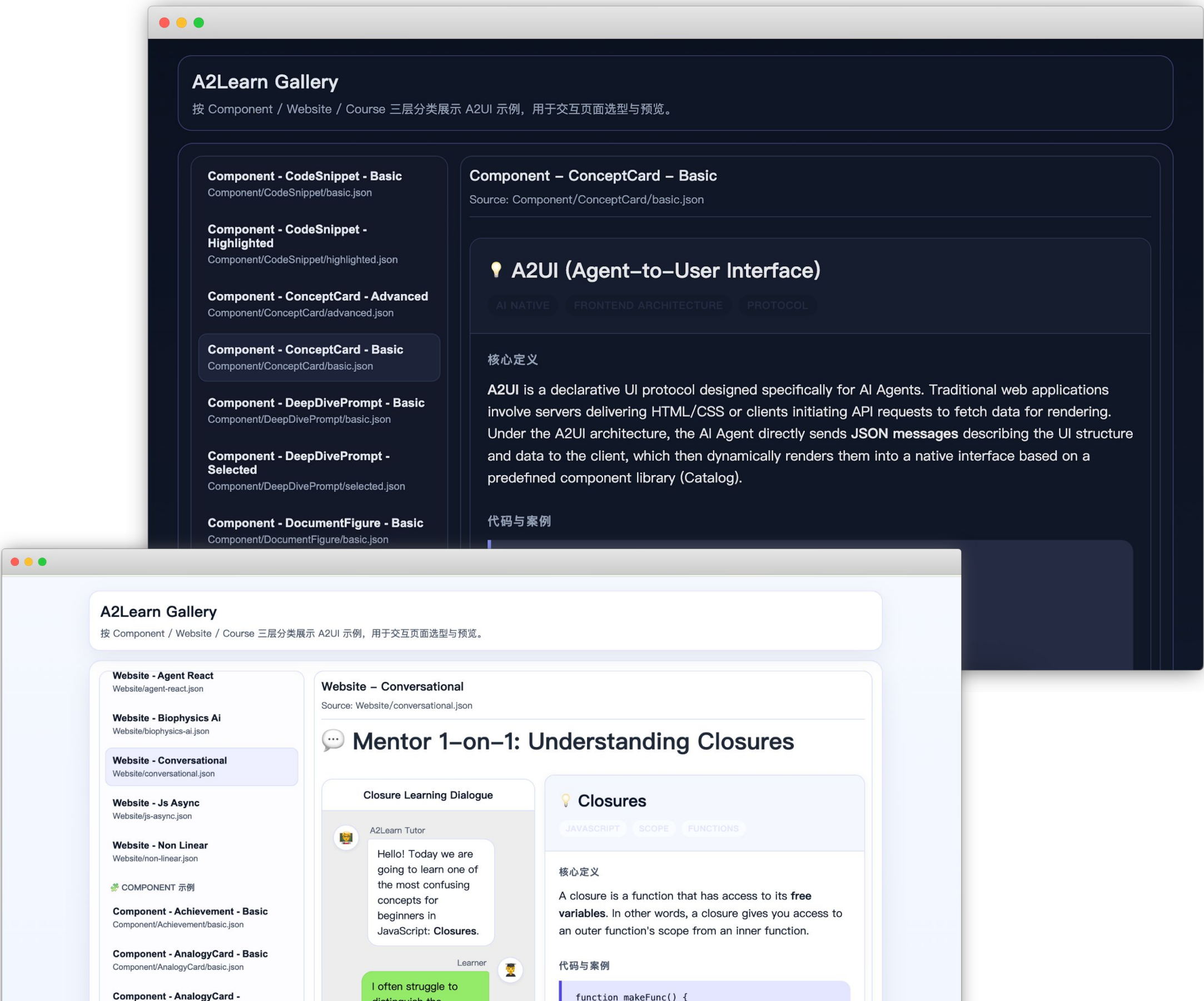


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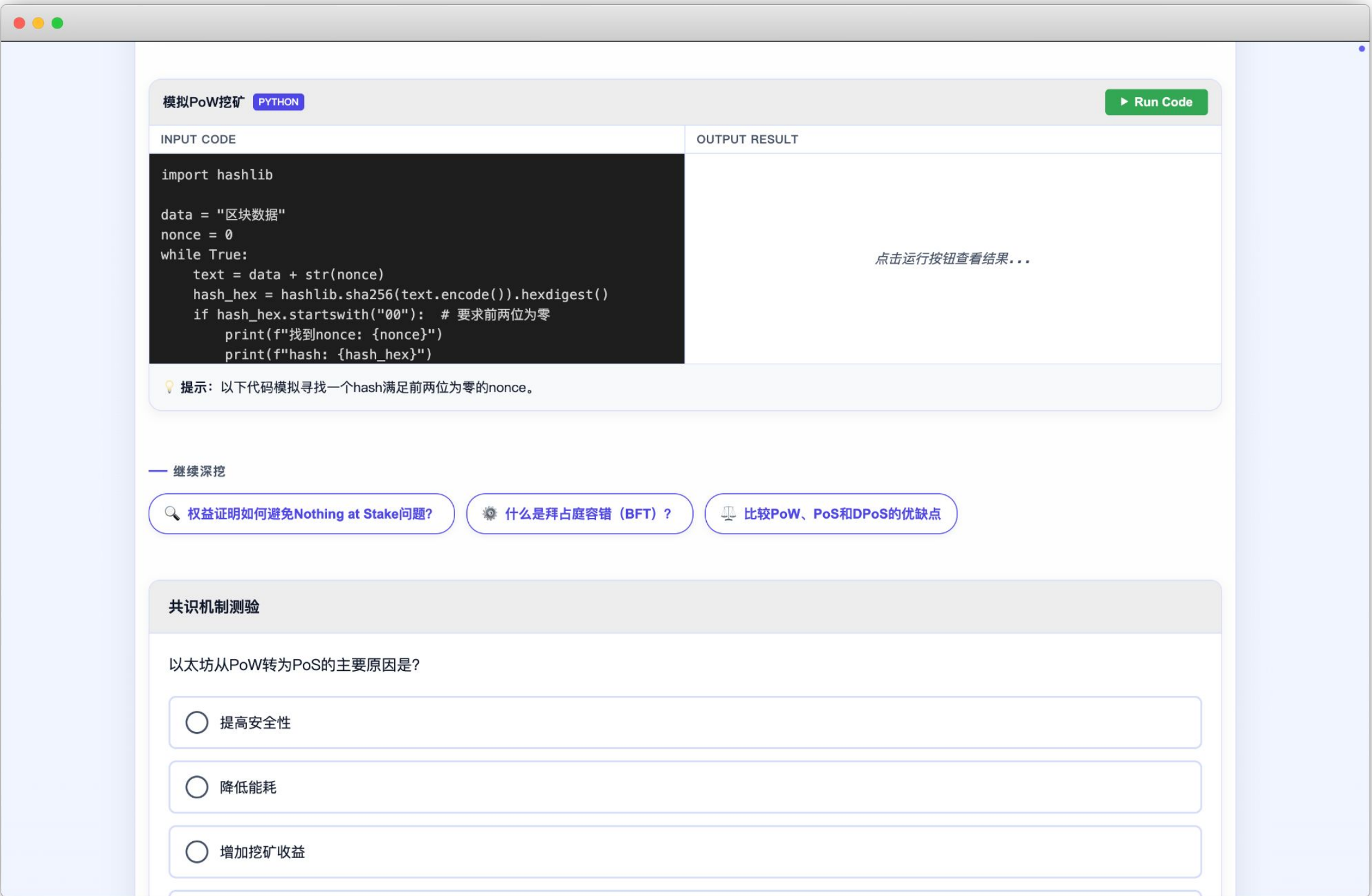


A2Learn Pipeline

Gallery for Component

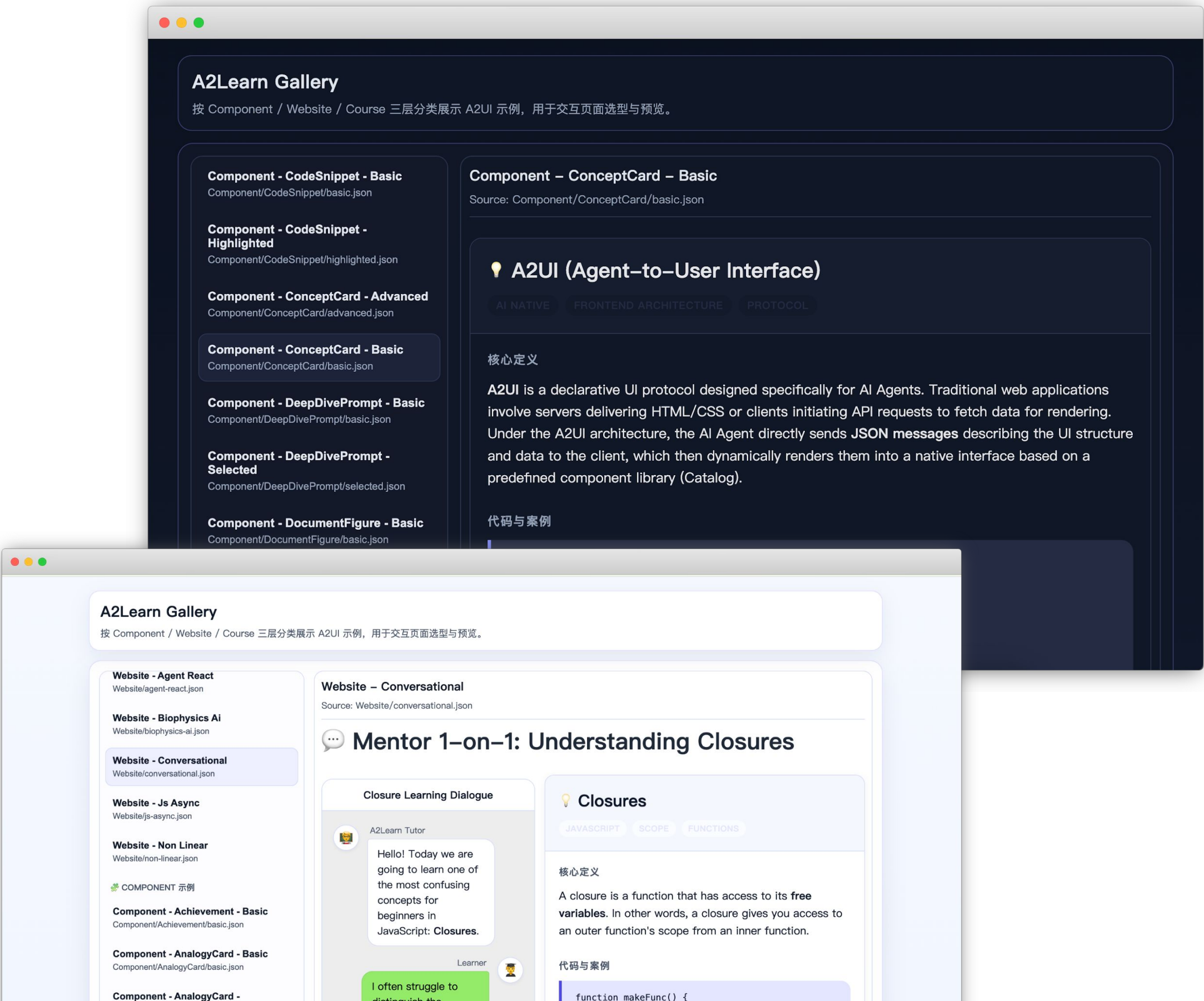


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(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```

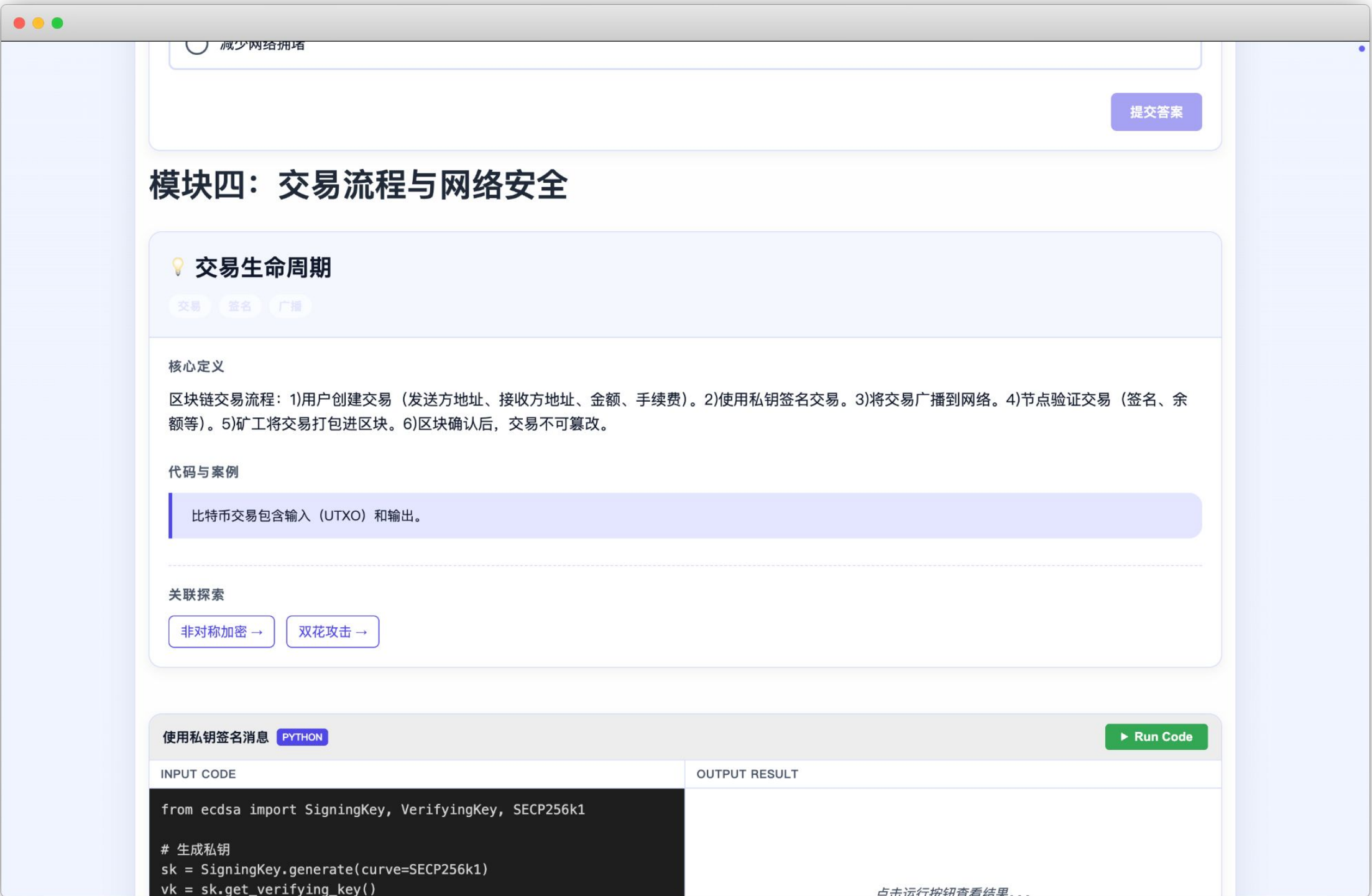


A2Learn Pipeline

Gallery for Component

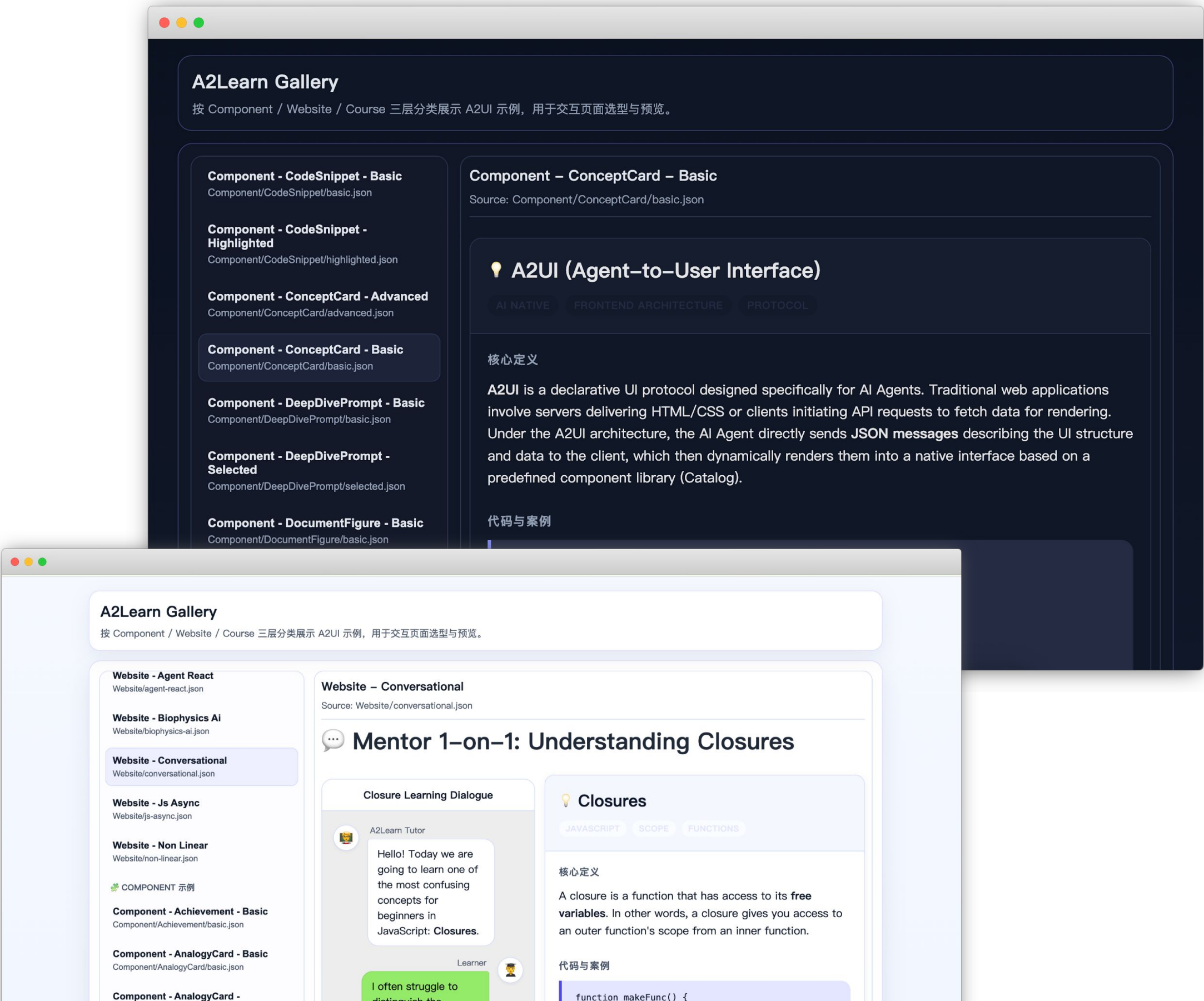


```
(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```

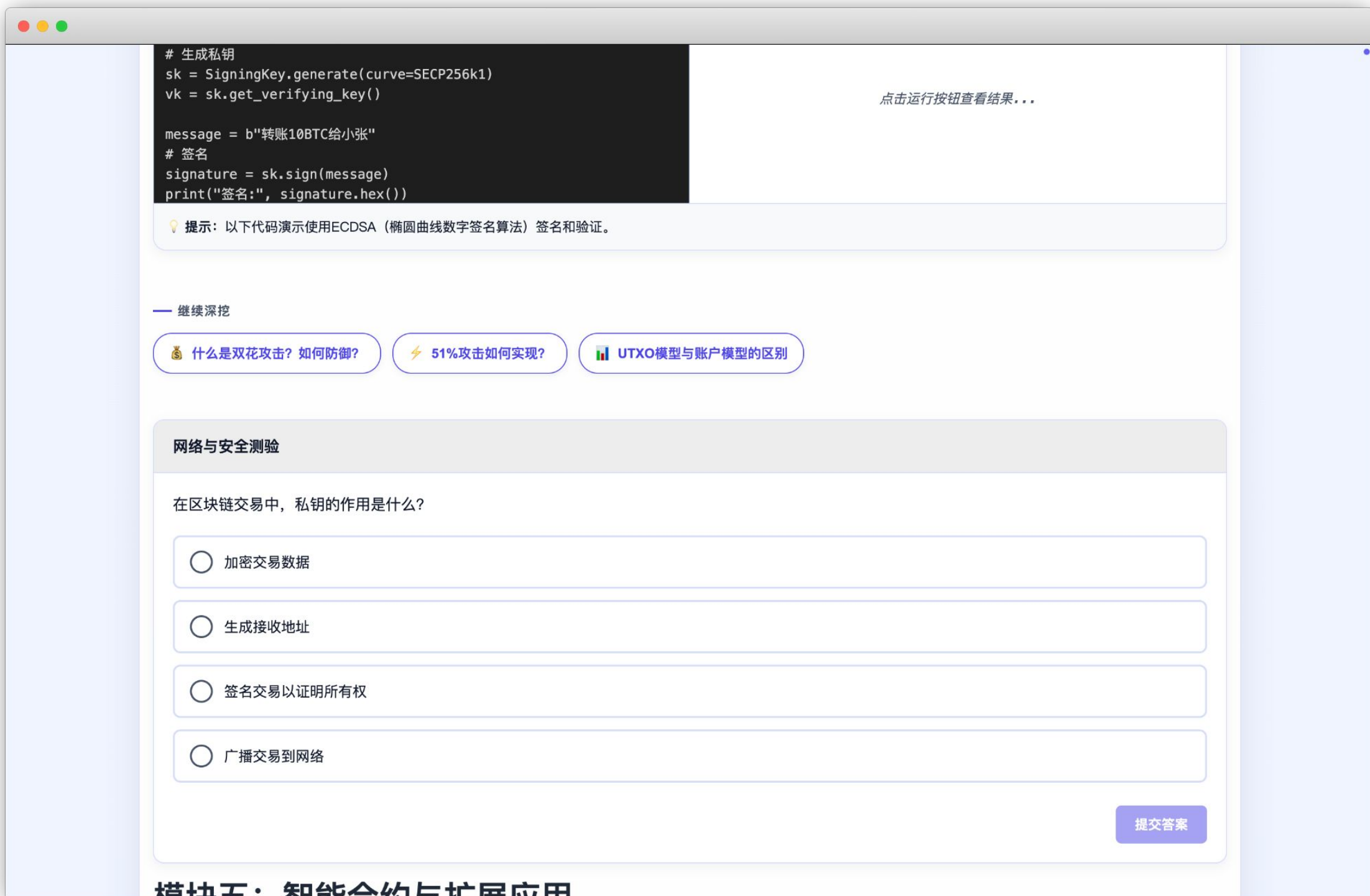


A2Learn Pipeline

Gallery for Component

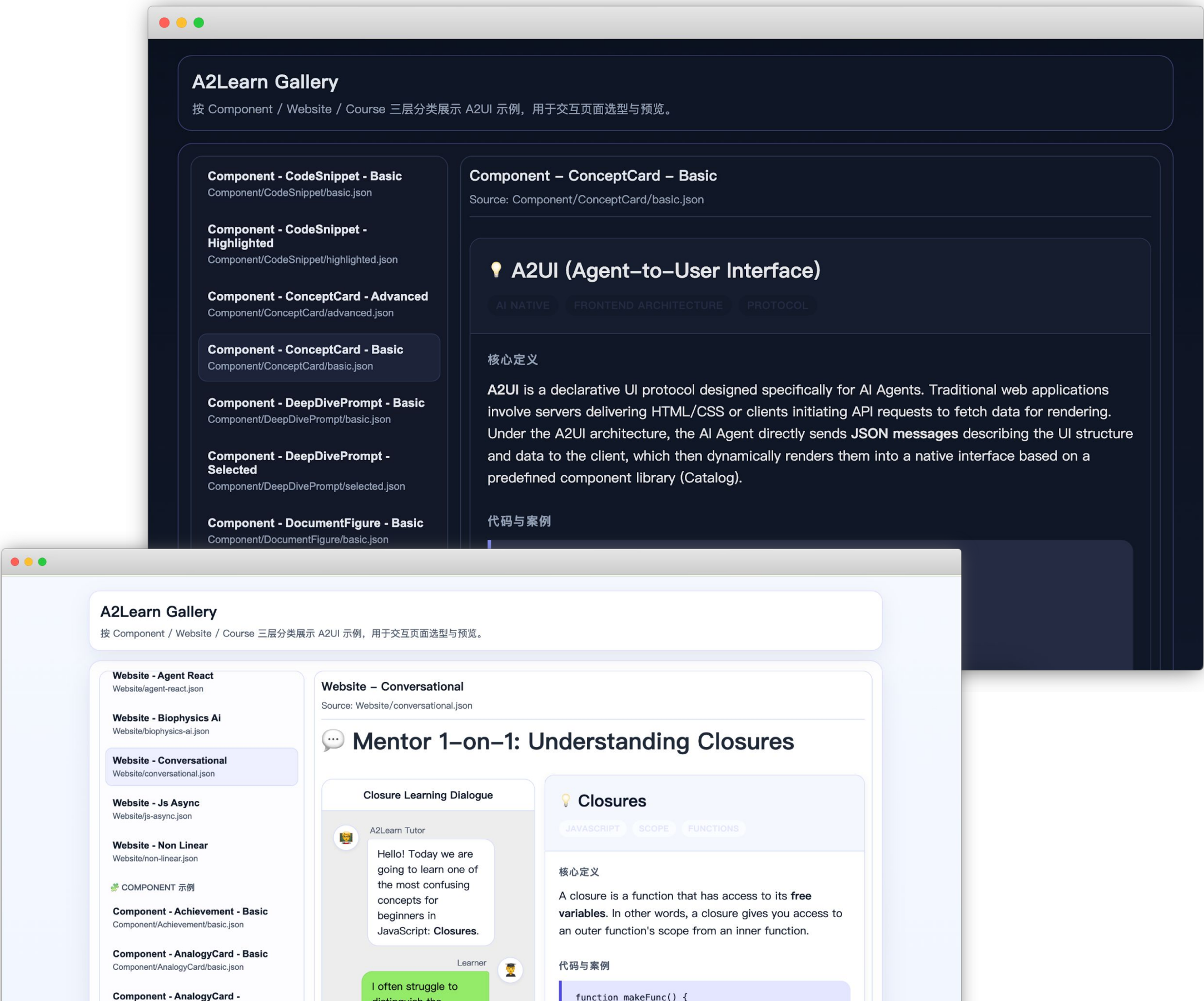


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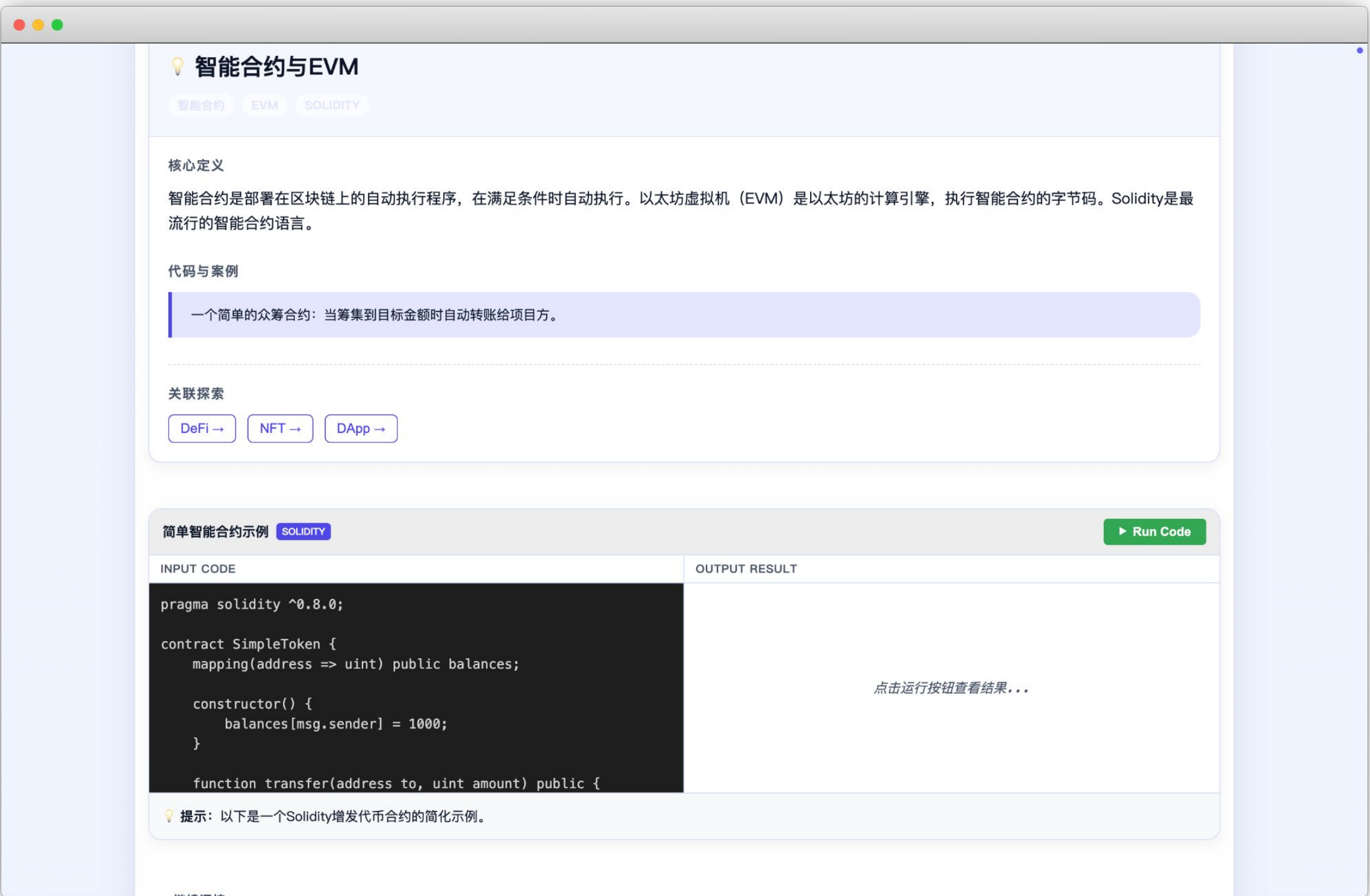


A2Learn Pipeline

Gallery for Component

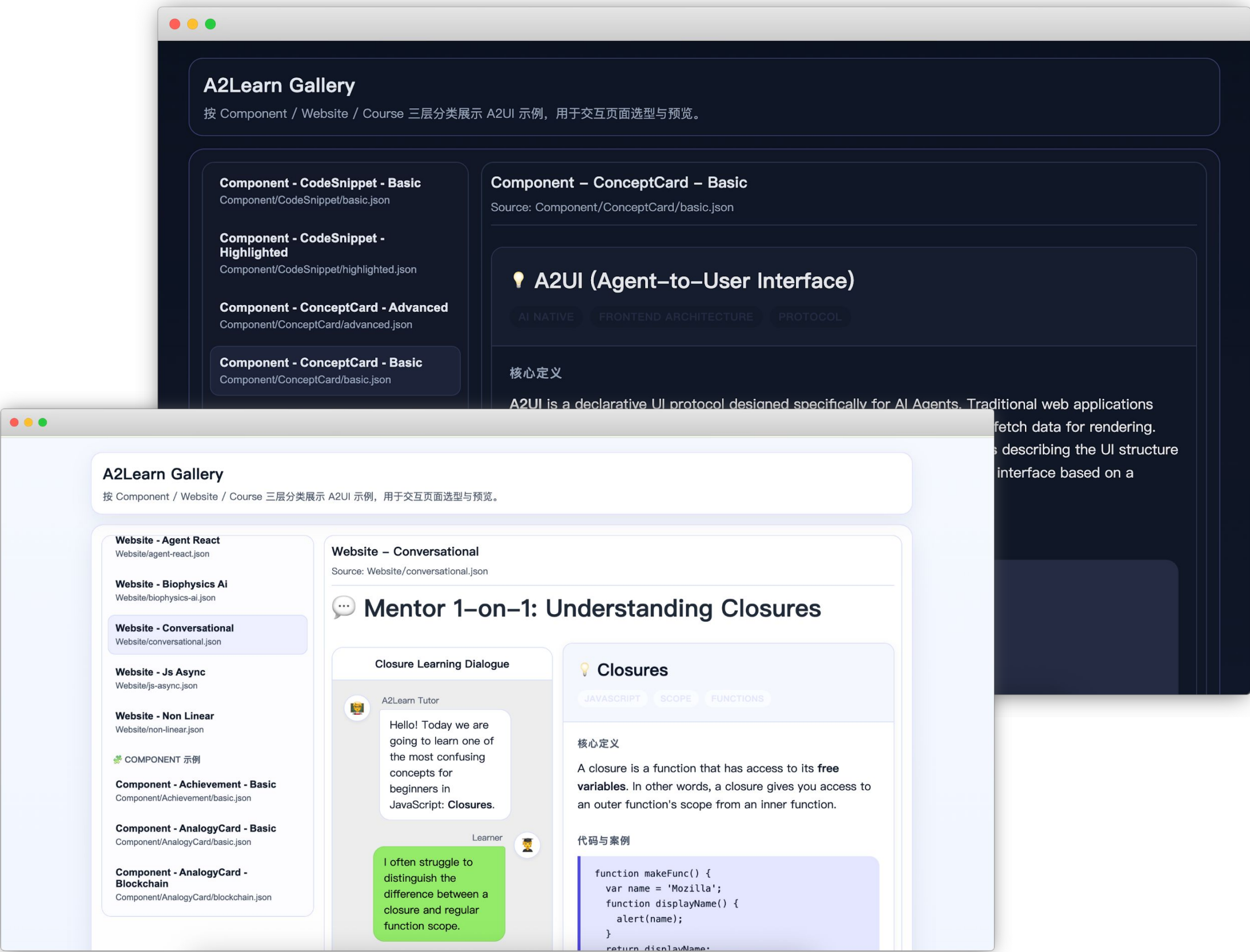


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(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```

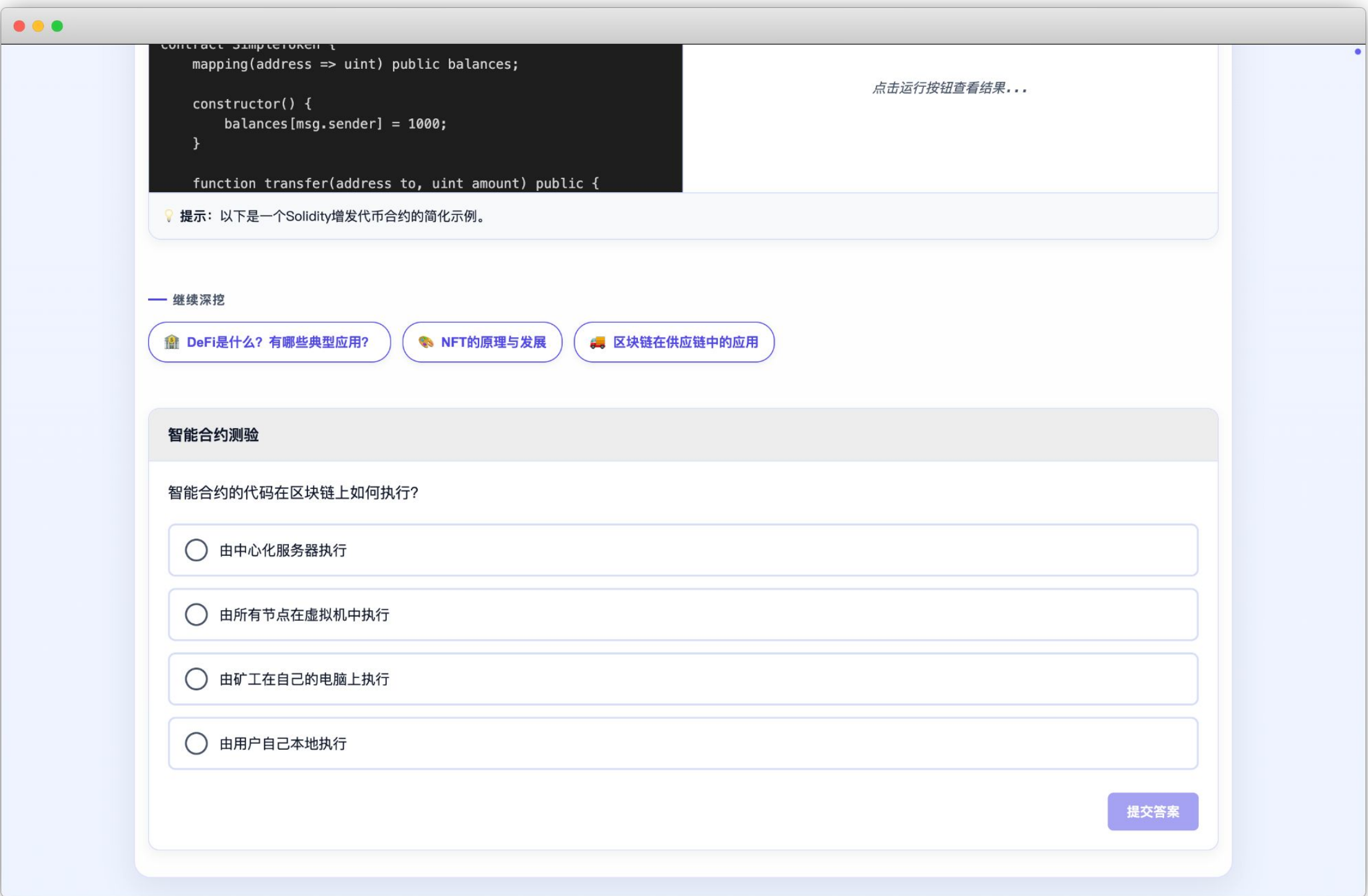


A2Learn Pipeline

Gallery for Component



```
(base) frank@zhuchens-MacBook-Pro A2Learn % bash start.sh --text "Explain how blockchain works"
```



Aura is a customizable agent living in your terminal

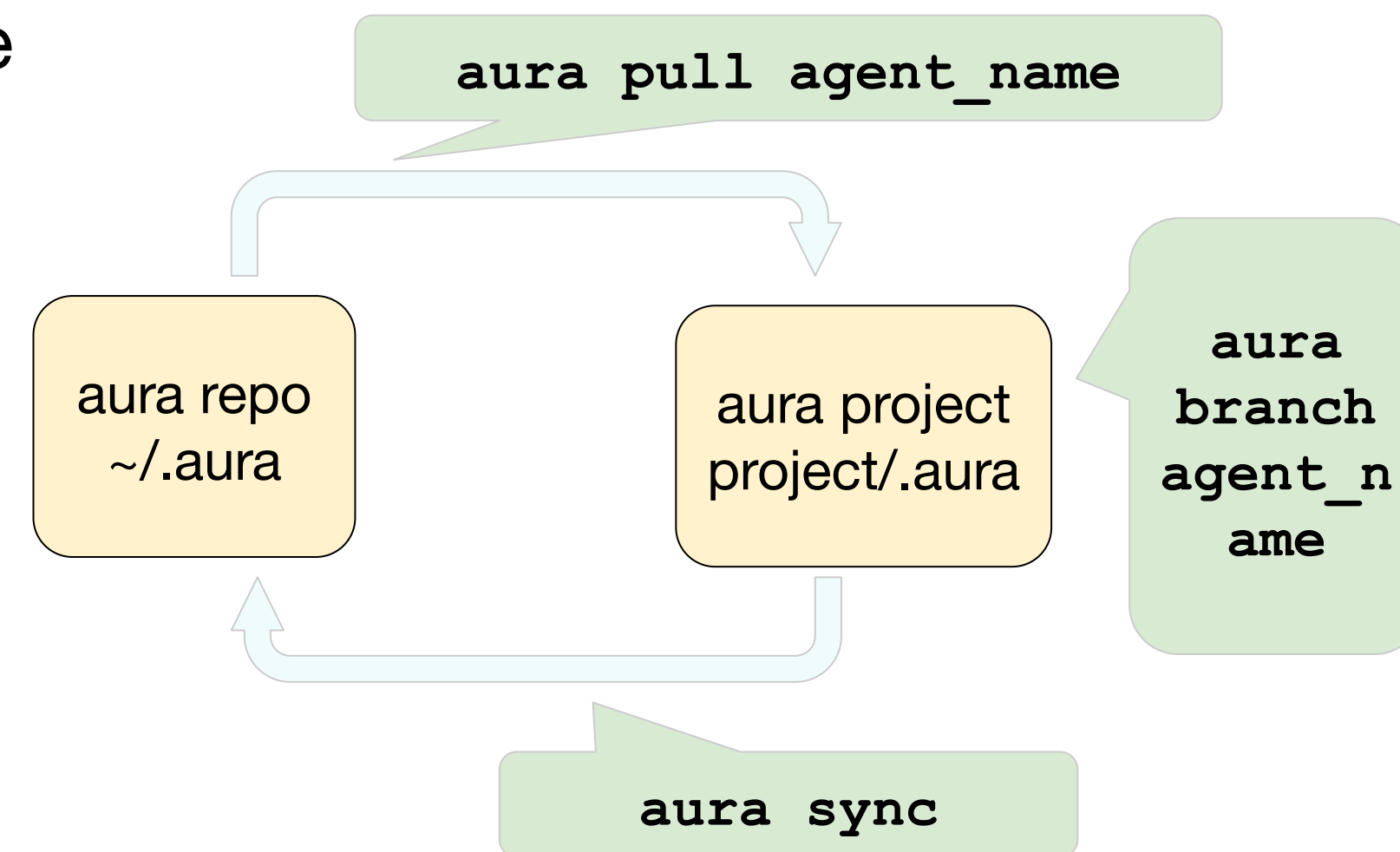
Everything is a file

1. keep kernel thin while filesystem fat
2. declarative tools and customizable prompt
3. .hint system for context injunction
4. state.db for auditing
5. .aura living in your workspace

```
.aura
├── config.yml
├── instructions
│   ├── AGENTS.md
│   ├── SOUL.md
│   ├── TOOLS.md
│   └── USER.md
├── skills
│   ├── skill-creator
│   ├── skills.md
│   └── system.md
├── state
│   ├── ask_sessions
│   ├── commands
│   ├── personas
│   └── sessions
├── task.md
├── tools
│   ├── bash_command
│   ├── mcp
│   └── read_file
```

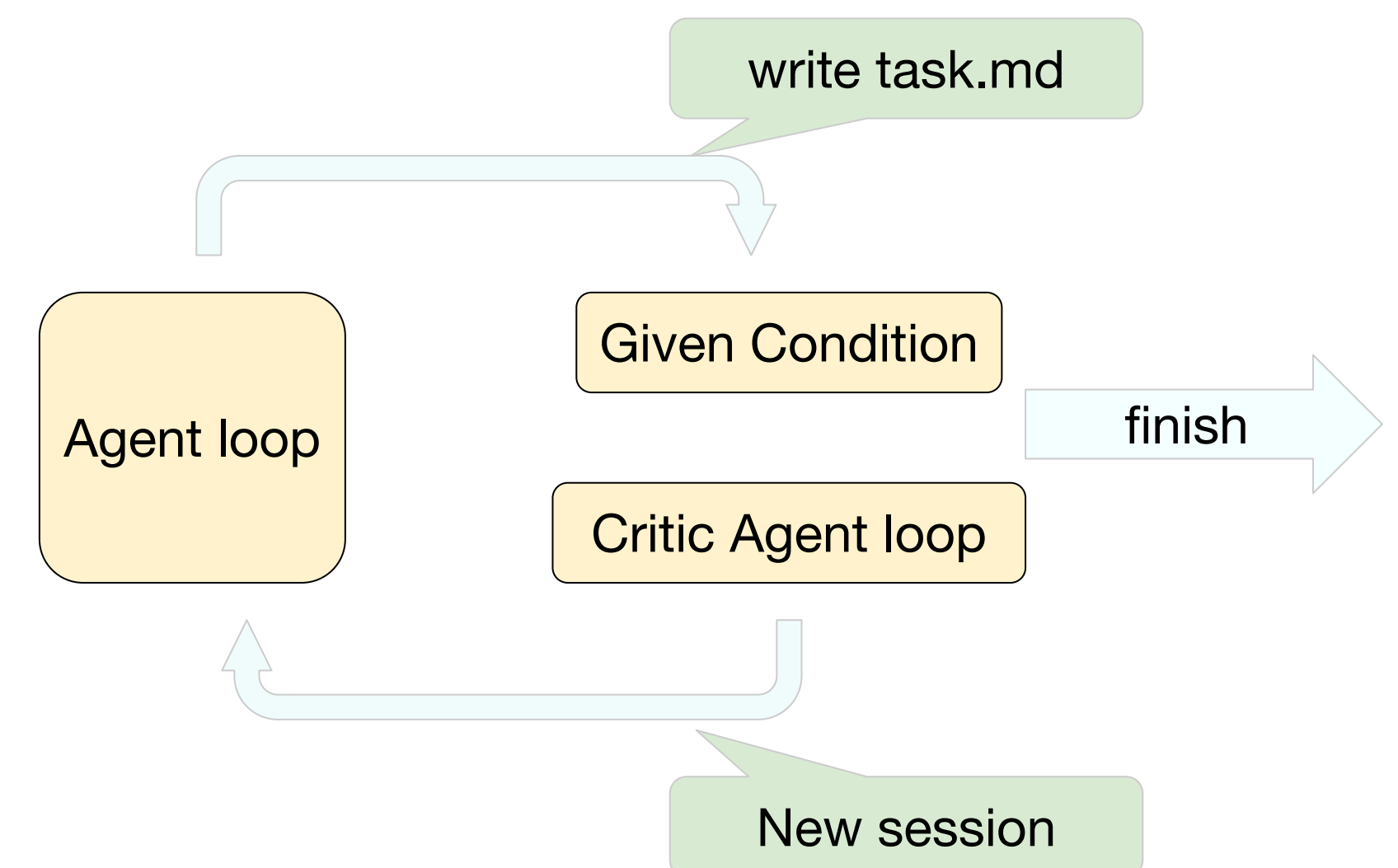
Version Control System(VCS)

1. Git based VCS
2. Pull or Push customizable agent
3. .shadow for in-project version control

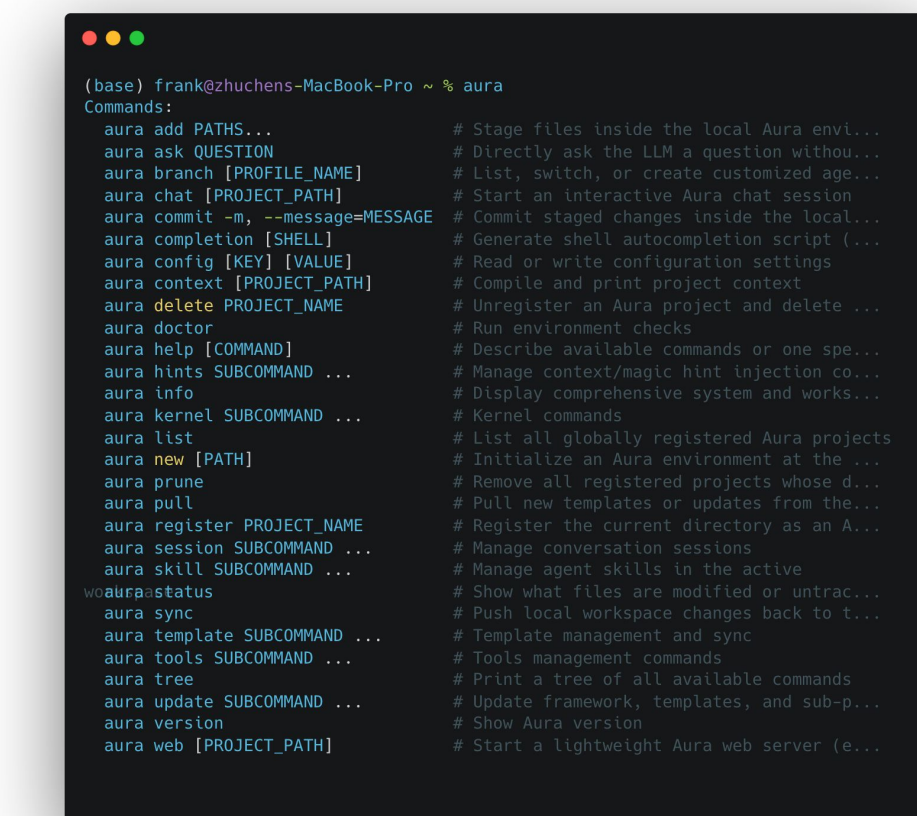
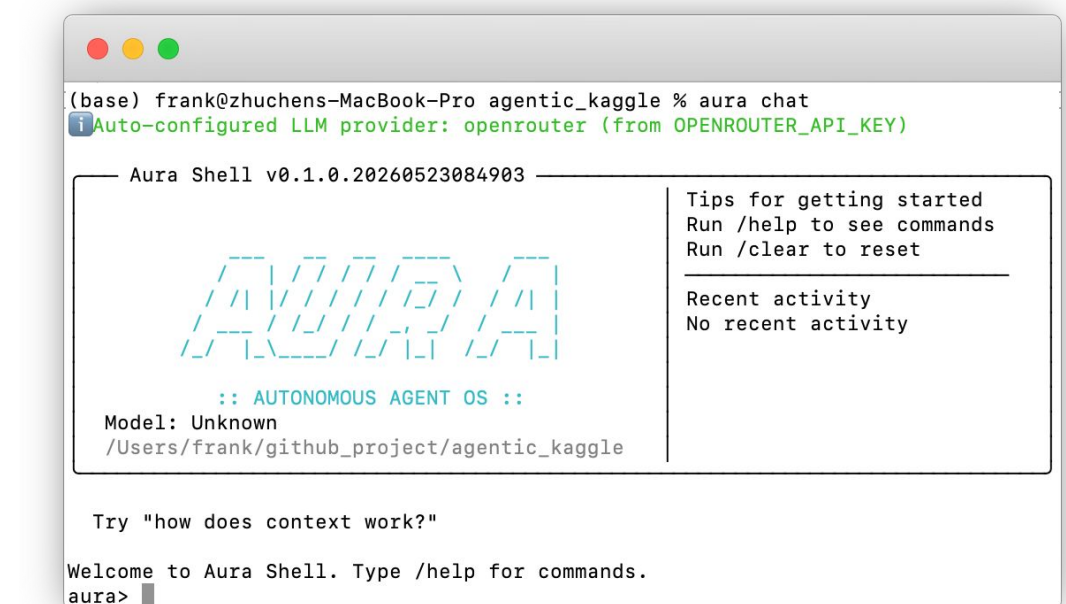
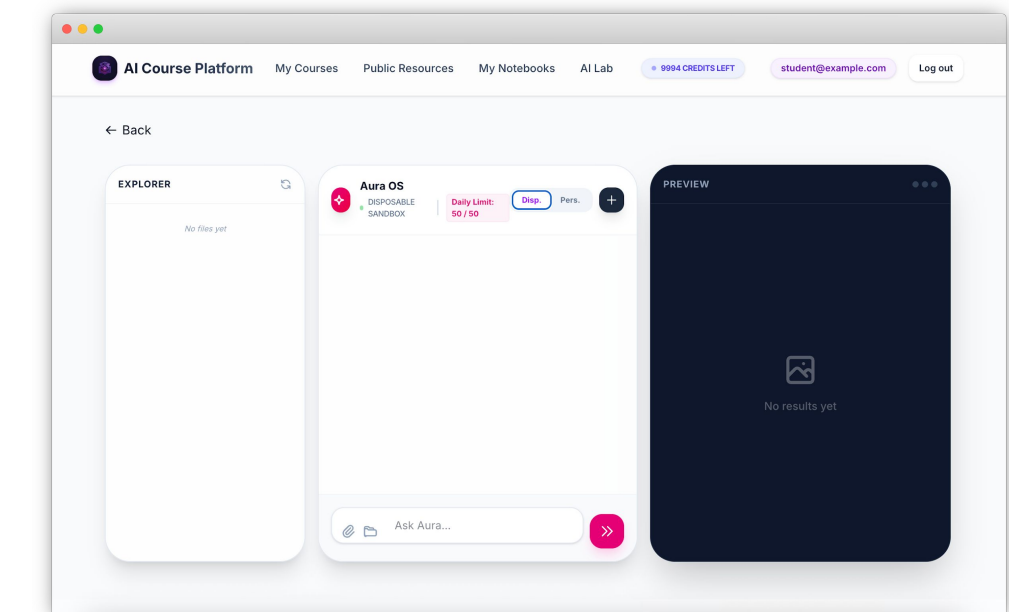
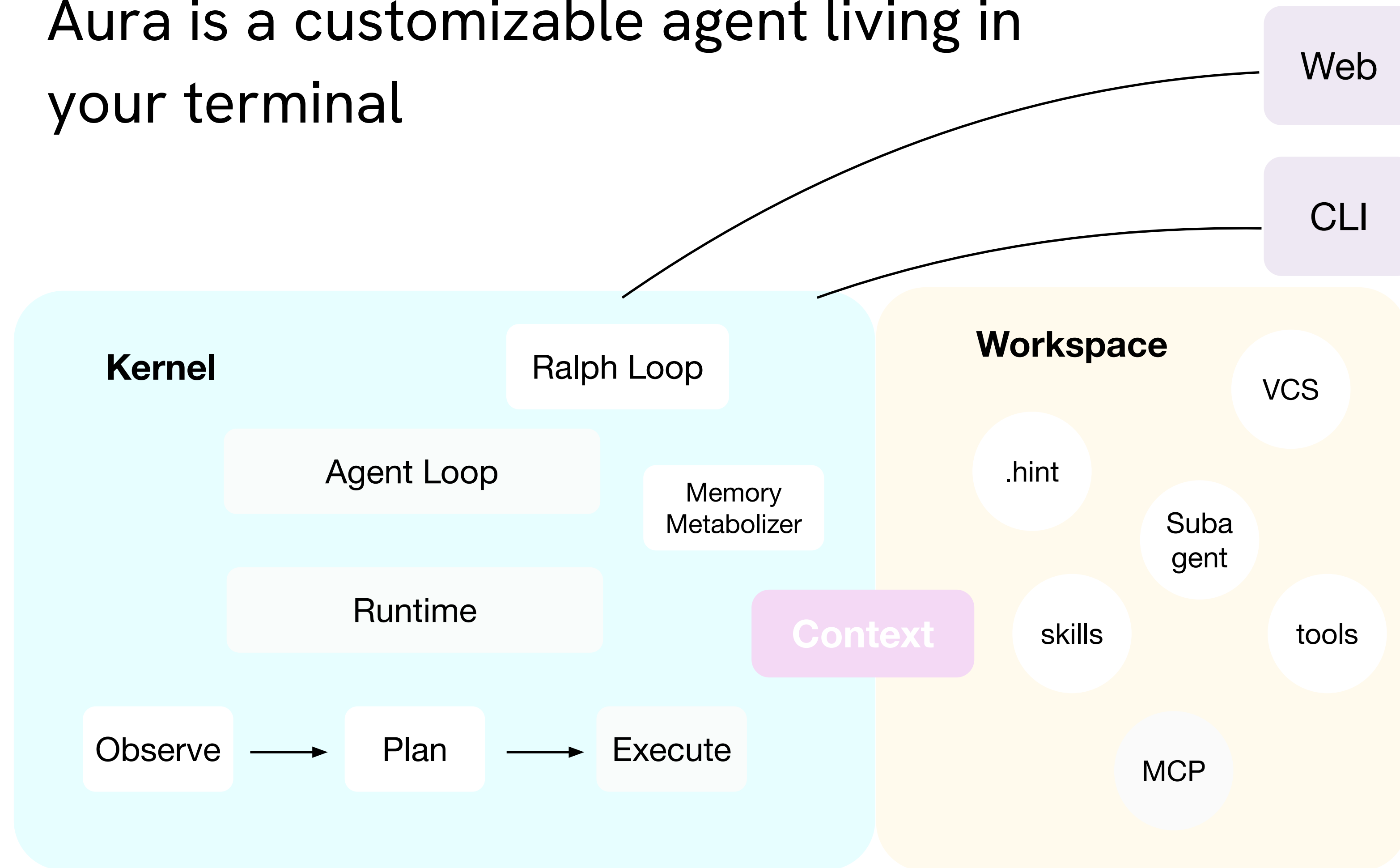


Ralph Loop

1. autonomous agent with long term task
2. Stop when
 - 1) satisfy a certain condition
 - 2) a critic agent pass
3. Refreshing new agent avoiding anchor effect



Aura is a customizable agent living in your terminal



Thank you!

221503015 物理学 朱辰

Contact
zc18202534657@gmail.com

Reference

Zhao, B., Zhang, J., Ren, X., Guo, Z., Chu, T., Ma, Y., & Huang, C. (2026). DeepTutor: Towards agentic personalized tutoring. *arXiv preprint arXiv:2604.26962*.

Tu, S., Li, Y., Chen, K., Zhang, S., Yu, J., Zhang-Li, D., Hou, L., Li, J., Zhang, Y., & Liu, H. (2026). MAIC-UI: Making interactive courseware with generative UI. *arXiv preprint arXiv:2604.25806*.