



# 推理规划方案与CrewAI高级用法

# 目录

CONTENTS

推理规划方案

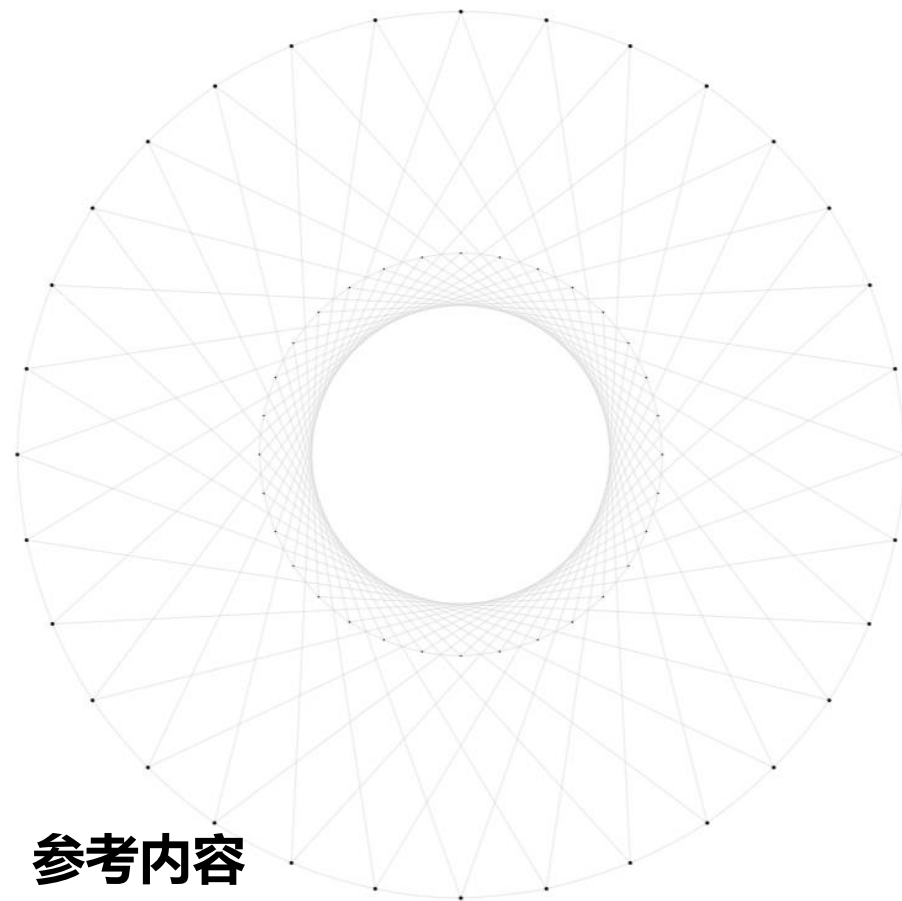
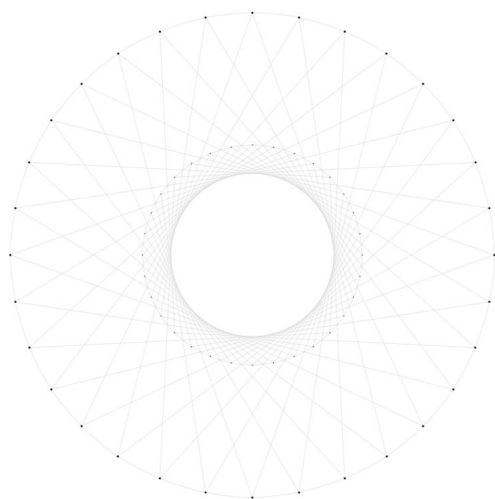
PART ONE

CrewAI高级用法

PART TWO

参考内容

PART THREE





# 推理规划方法

PART ONE

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# Agent的基本运作形式

Agent可以接收外部提供的输入或者查询，然后实行内部决策来完成响应。在内部运作过程中，最为基本的步骤包括：

- 目标拆解、任务规划
- 工具选择、参数提出
- ...

工具选择及参数提出的操作前提是将预设好的工具集置入prompt中提供给LLM，实现较为简单；对于各类框架、各种Agent项目来说，其内核的异同往往存在于目标拆解、任务规划方面的设计中。

# 推理规划方案

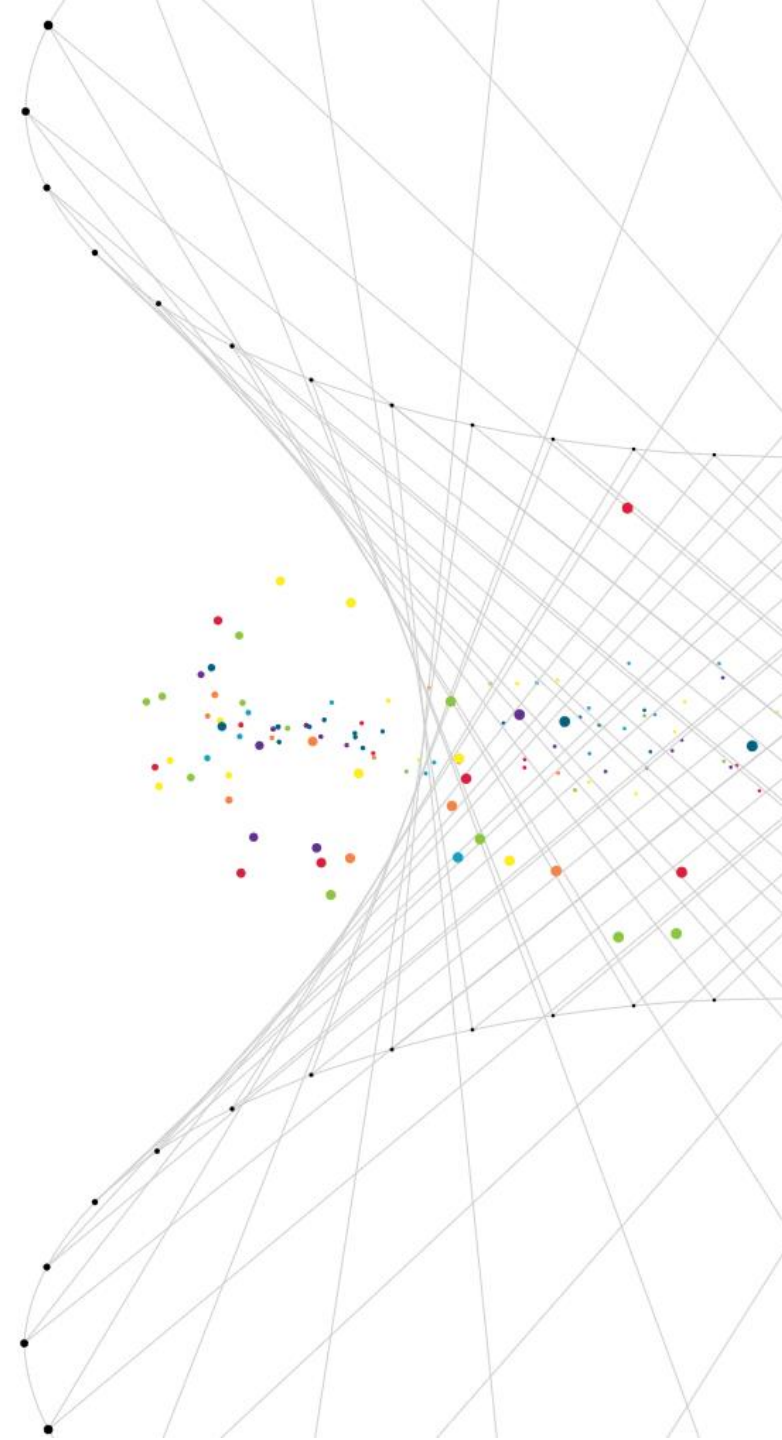
COT(Chain Of Thoughts)

ReAct(Reason+Act)

Reflexion

ReWOO(Reasoning WithOut Observation)

Dual-loop mechanism of XAgent





## COT(Chain Of Thoughts)

引导LLM组织思维并构建顺序逻辑，从而将复杂问题分解为相对简单的步骤或概念，从而解决问题。其实现方式是在prompt中加入类似“Let's think step by step”等引导逐步思考的概念用语，本质是将LLM推理过程拆分为Reasoning Extraction和Answer Extraction两个阶段促使LLM“先思考再回答”。

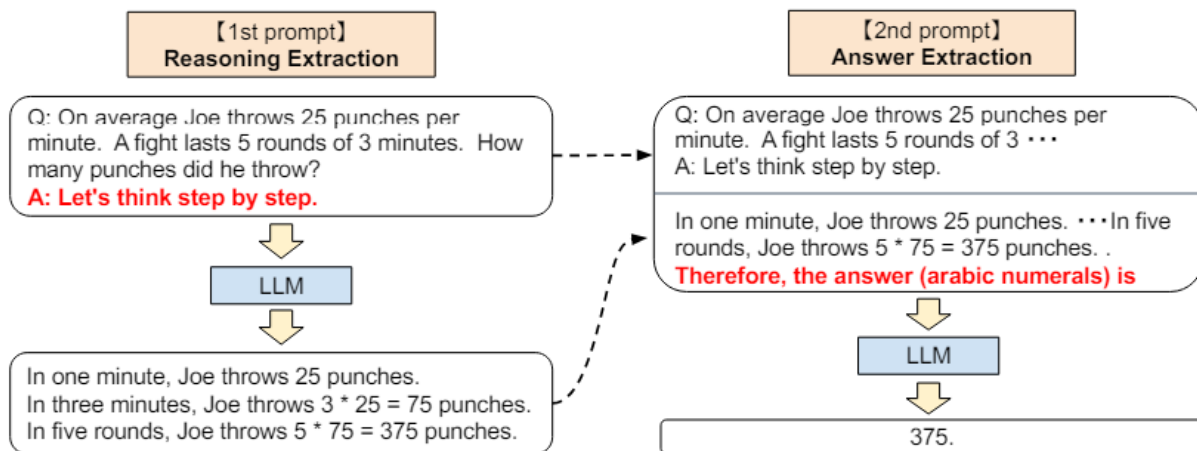
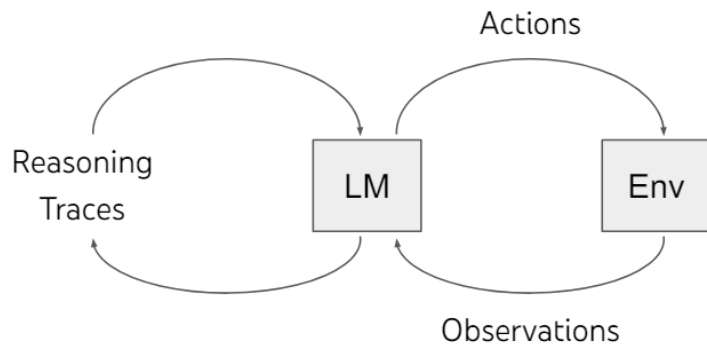


Figure 2: Full pipeline of Zero-shot-CoT as described in § 3: we first use the first “reasoning” prompt to extract a full reasoning path from a language model, and then use the second “answer” prompt to extract the answer in the correct format from the reasoning text.

## ReAct(Reason + Act)

引导LLM以交错方式进行跟踪式推理，以作用于不同的特定任务。具体表现为LLM可进行归纳、执行甚至处理异常，同时在行动步骤中允许与外部环境进行交互以获取更充分的信息。



ReAct (Reason + Act)

# ReAct(Reason + Act)

下述例子体现了ReAct的几个优势：

- 多跳问题适应
- 外部交互适应

## (1) Hotspot QA

Question: How many rooms are in the hotel that is home to the Cirque du Soleil show Mystere?

HotspotQA label: 2,664

Outdated ✗

## (1a) Standard

Answer: 3,000 ✗

## (1b) CoT (Reason Only)

Thought: Let's think step by step. The hotel that is home to the Cirque du Soleil show Mystere is Treasure Island. Treasure Island has 2,885 rooms, so the answer is 2,885.

Answer: 2,885 ✗

## (1c) Act-Only

Act 1: Search[Cirque du Soleil]  
Obs 1: Cirque du Soleil is a Canadian entertainment company...  
Act 2: Lookup[Mystere]  
Obs 2: No more results  
Act 3: Search[Mystere (Cirque du Soleil show)]  
Obs 3: Could not find...  
Act 4: Search[Mystere (Cirque du Soleil)]  
Obs 4: Mystere (my-steer) is one of six...  
Act 5: Lookup[Treasure Island Hotel and Casino]  
.....(end without answer) ✗

## (1d) ReAct (Reason + Act)

Thought 1: I need to search Cirque du Soleil show Mystere, find the hotel it is in, then find the number of rooms in the hotel.

Act 1: Search[Cirque du Soleil show Mystere]

Obs 1: Could not find Cirque du Soleil show Mystere. Similar: ['Cirque du Soleil' ...]

Thought 2: To find the hotel, I can search Mystere (Cirque du Soleil).

Act 2: Search[Mystere (Cirque du Soleil)]

Obs 2: Mystere (my-steer) is ... Held in a custom theatre at the Treasure Island Hotel and Casino ...

Thought 3: Mystere is held in a custom theatre at the Treasure Island Hotel and Casino. So I need to search Treasure Island Hotel and Casino next and find the number of rooms in the hotel.

Act 3: Search[Treasure Island Hotel and Casino]

Obs 3: Treasure Island Hotel and Casino ... with 2,884 rooms and 220 suites ...

Thought 4: Treasure Island Hotel and Casino has 2,884 rooms and 220 suites. So the answer is 3,104.

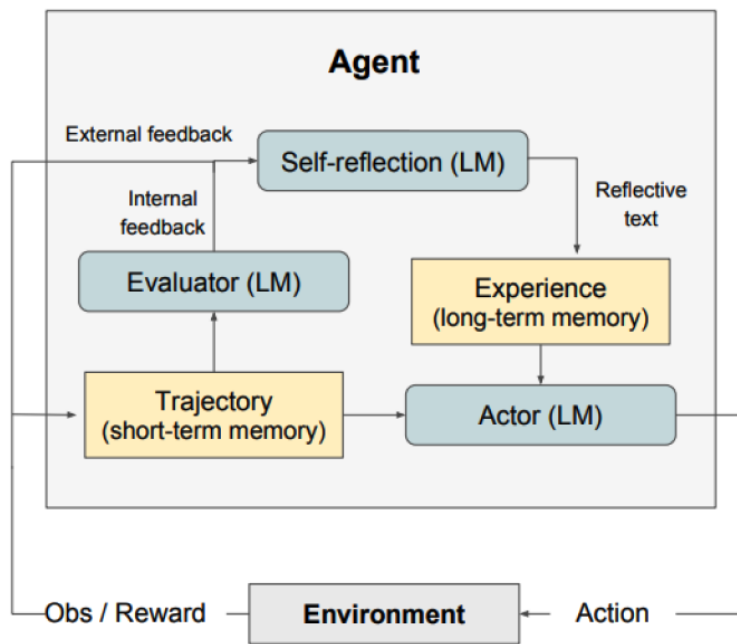
Act 4: Finish[3,104]

Up-to-date ✓

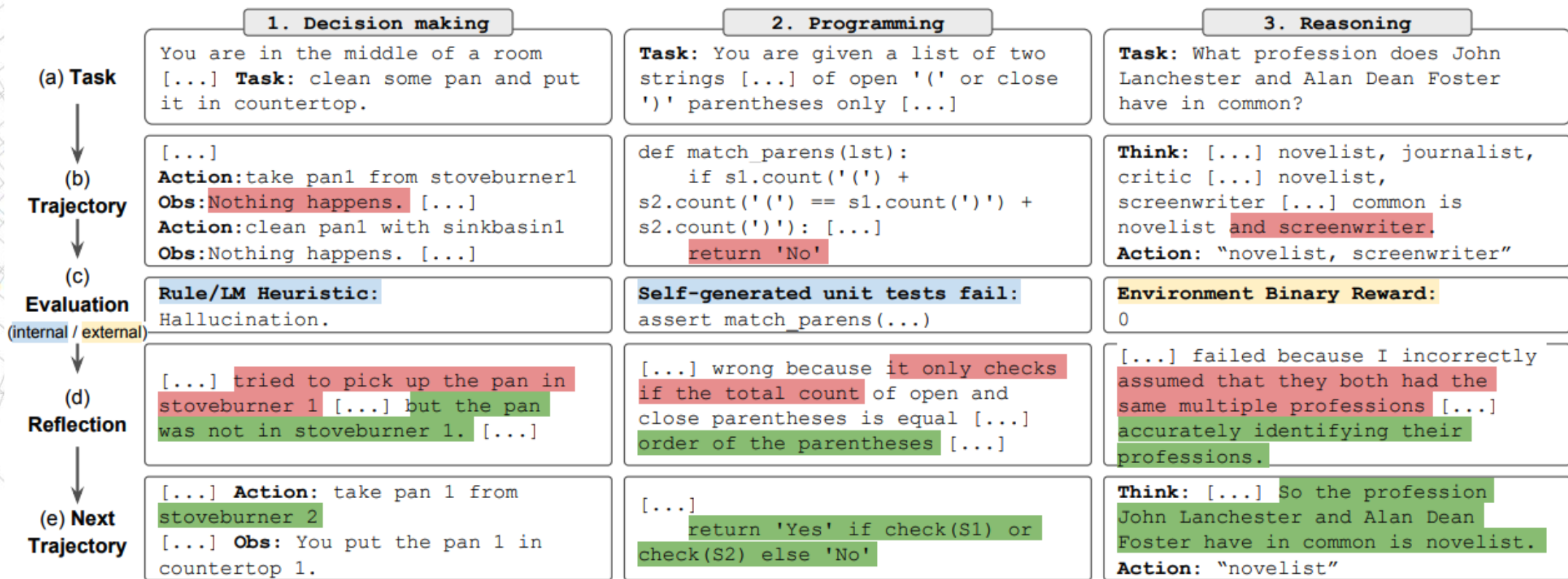


# Reflexion

借助Evaluator评估来自环境的反馈，再结合行为轨迹供LLM进行自我反思，记录成必要的过往经验，在每次执行动作时都将参考过往经验以最快适应当前环境，这些必要经验甚至在同环境下都仍旧能对下一生命周期的Actor提供良好的参考信息。

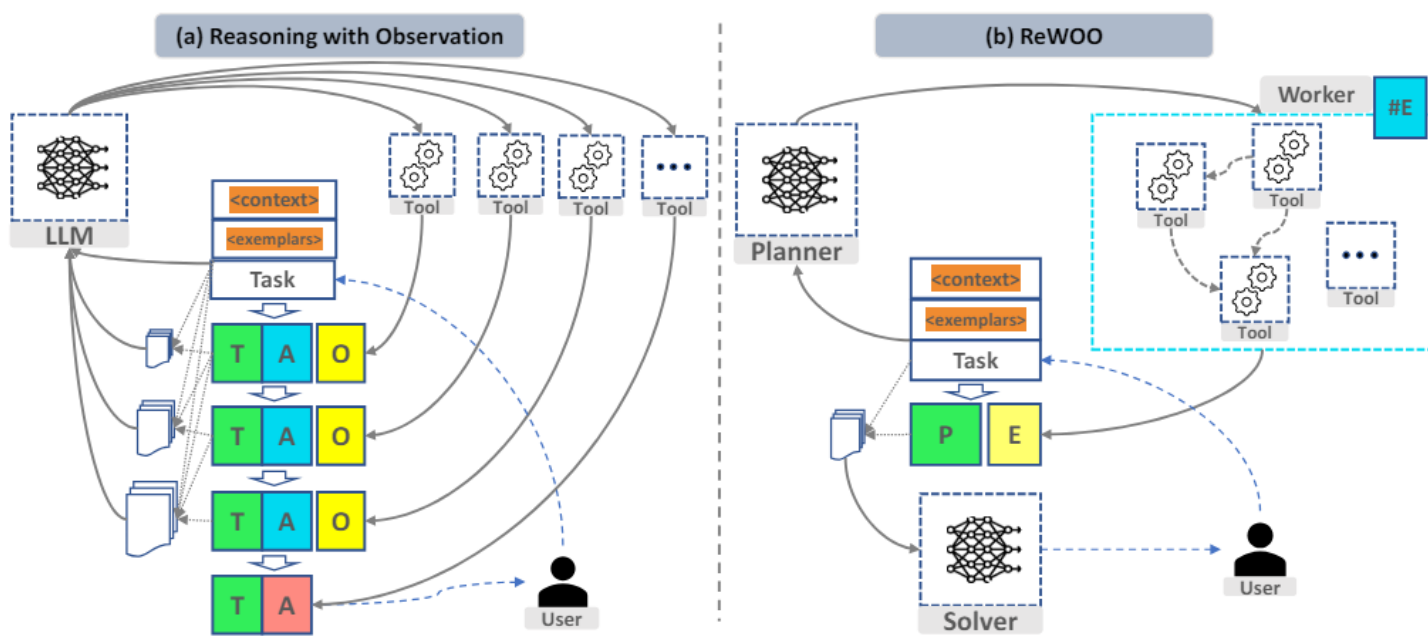


# Reflexion

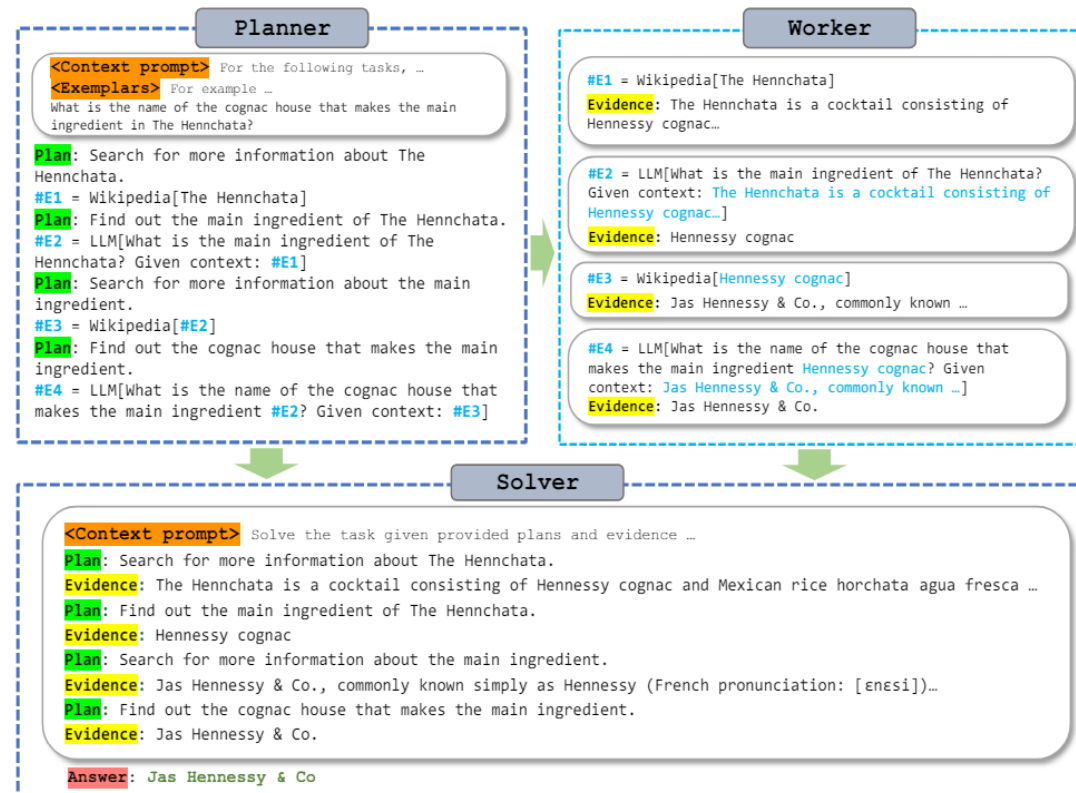


# ReWOO(Reasoning WithOut Observation)

ReAct一类的跟踪式推理方法可能会导致整体输入文本序列过长，大幅影响调用的成本效益。考虑通过预计划与预填充的手段来减少输入侧长度与调用次数，从而提高推理效率。



# ReWOO(Reasoning WithOut Observation)

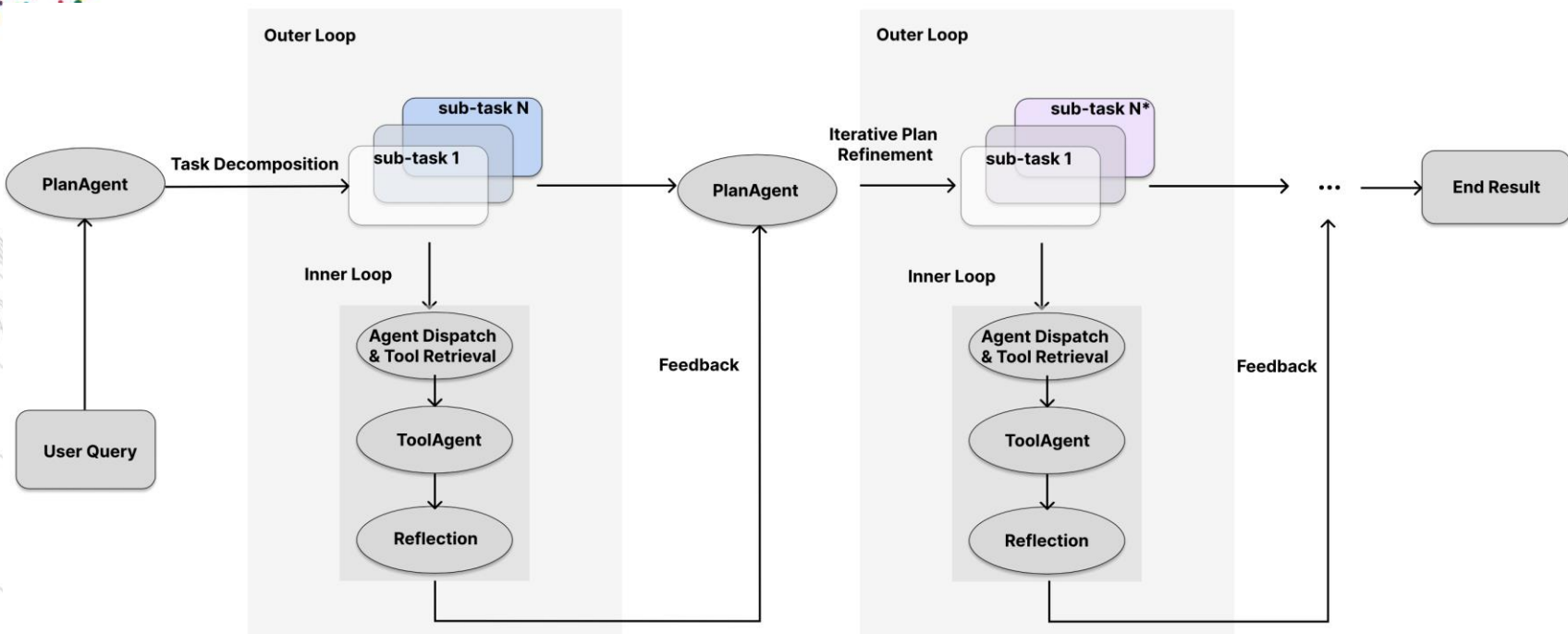





# Dual-loop Mechanism of XAgent

任务调度采用双循环的形式来进行：

- 外循环（outer loop）：生成并维护更易管理、更小单元的子任务队列。
- 内循环（inner loop）：对于队列中弹出的某个具体子任务来进行执行，根据执行子任务得到的反馈结果来调整外循环的子任务队列，如此往复直至完成所有子任务。







# CrewAI高级用法

## PART TWO

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## 环境配置

# 搭建并激活虚拟环境

```
conda create -n crewai python=3.10 pip -y  
conda activate crewai
```

# 安装框架

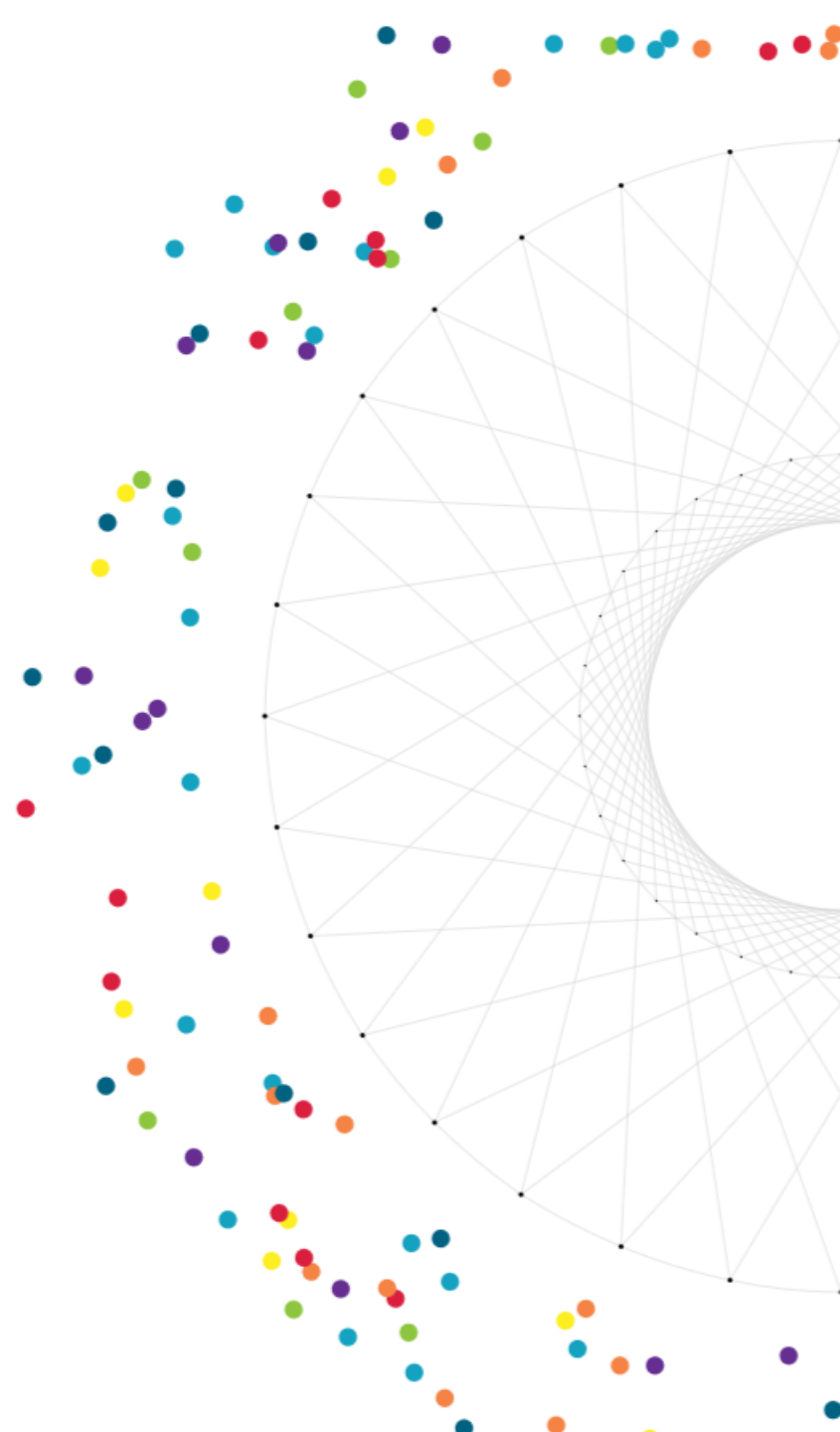
```
pip install crewai
```

# 安装其他必须库

```
pip install langchain  
pip install langchain_community  
pip install dashscope
```

# \*\*本节新增必须库\*\*

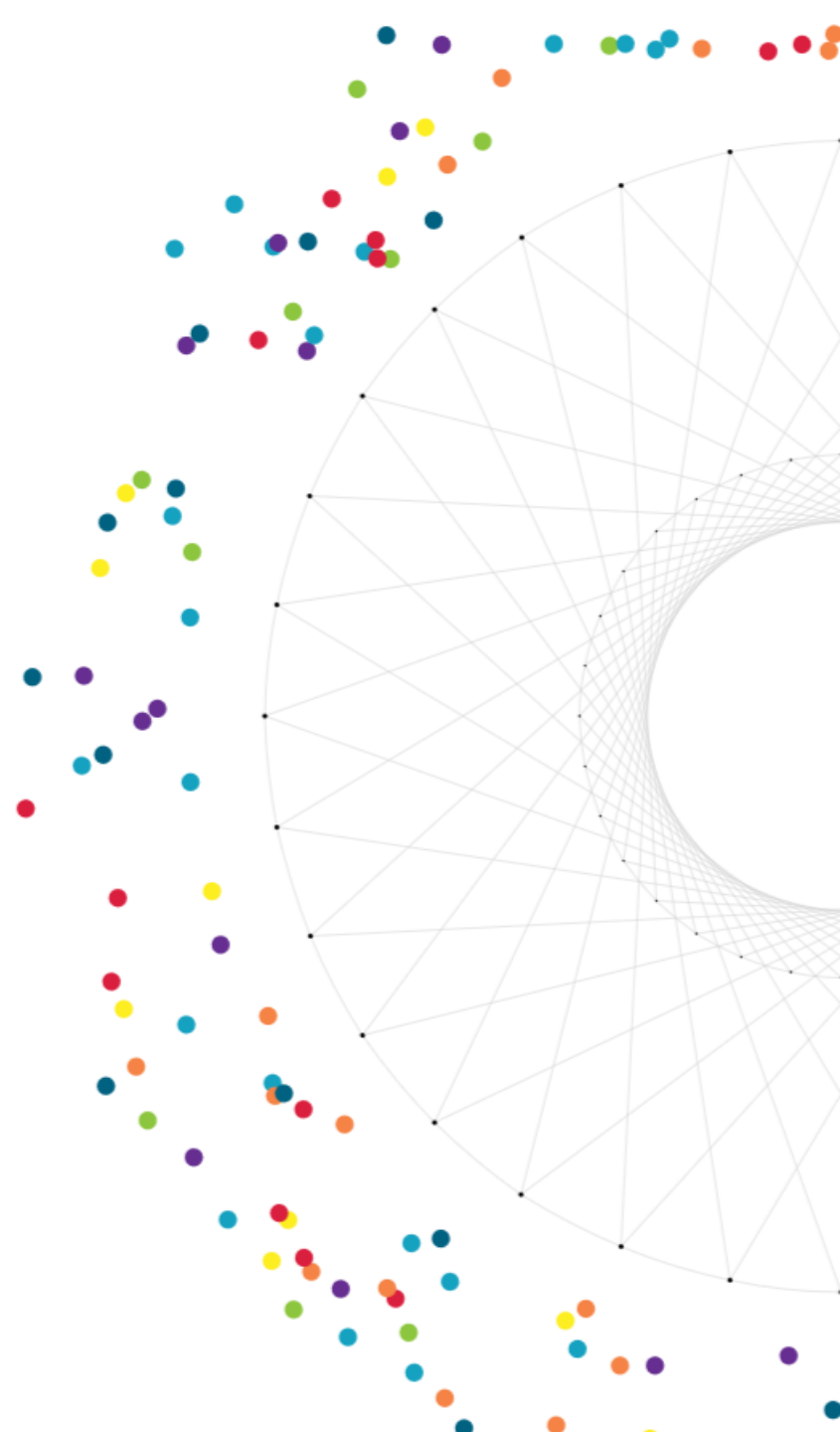
```
pip install crewai[tools]  
pip install requests
```



## API-KEY 申请

DashScope API-KEY

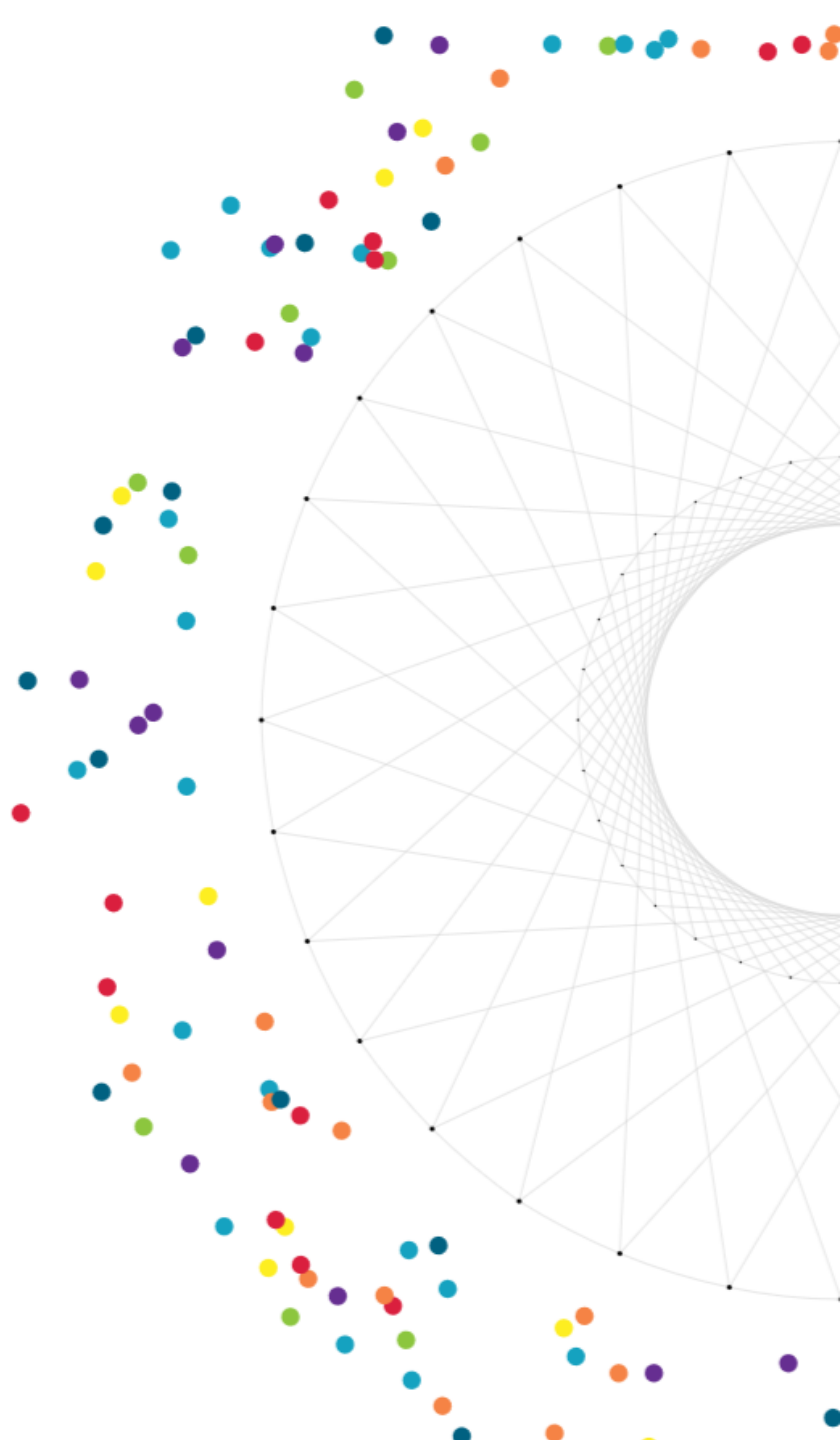
<https://help.aliyun.com/zh/dashscope/developer-reference/activate-dashscope-and-create-an-api-key>



## 实操代码

基于CrewAI使用多Agent协同完成创意剧本写作，在此基础上引入几项高级用法：

- 自定义工具
- 人机协作
- 本土化prompt
- 必要限制：max\_iter





# 参考内容

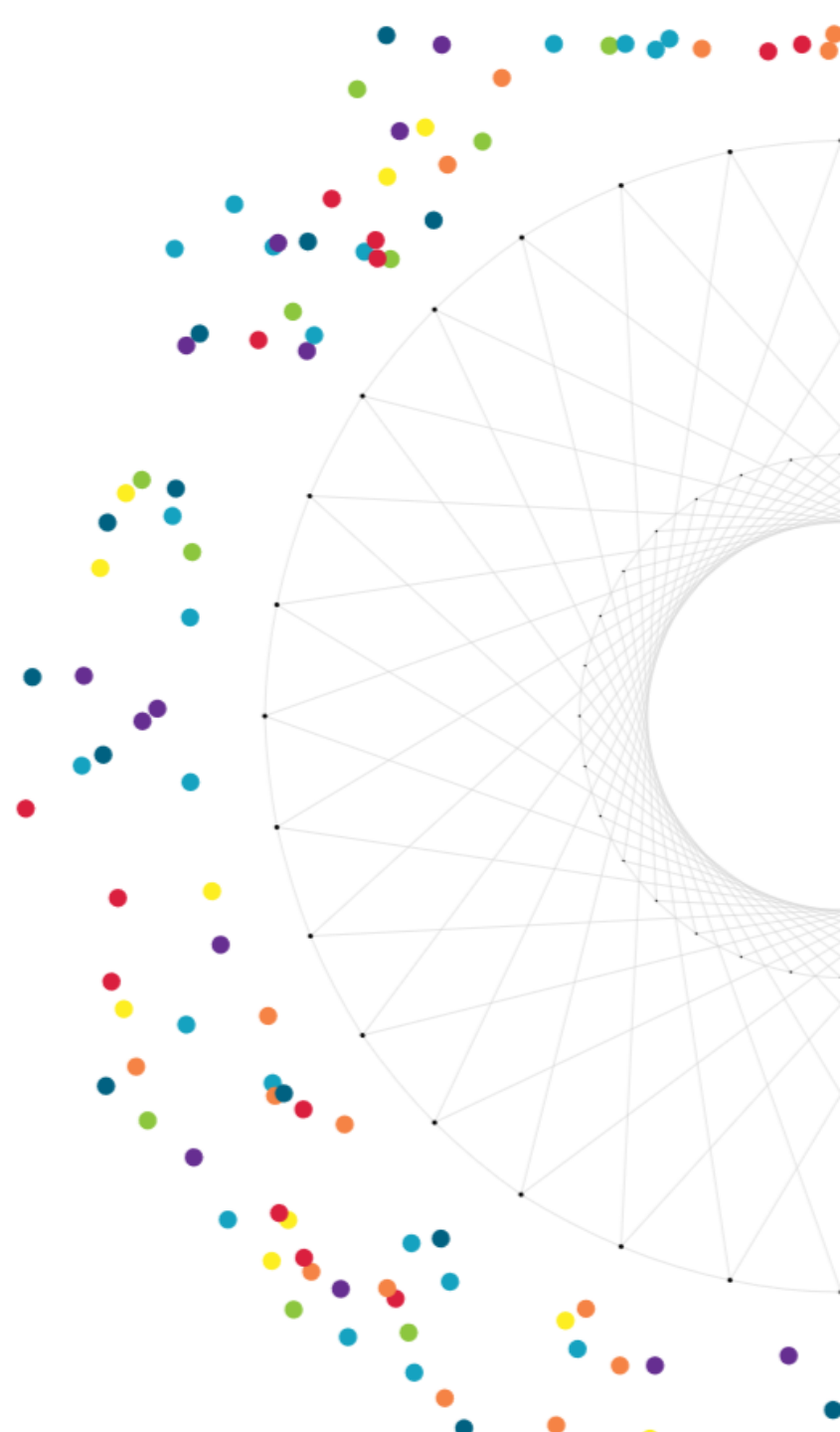
## PART THREE

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## 参考内容

1. <https://arxiv.org/abs/2201.11903>
2. <https://arxiv.org/abs/2210.03629>
3. <https://arxiv.org/abs/2303.11366>
4. <https://arxiv.org/abs/2305.18323>
5. <https://blog.x-agent.net/blog/xagent/>
6. <https://help.aliyun.com/zh/dashscope/developer-reference/activate-dashscope-and-create-an-api-key>
7. <https://github.com/joaomdmoura/crewAI>



The background features a complex geometric pattern of thin, light gray lines that intersect to form a hyperboloid of two sheets. Scattered throughout the image are numerous small, multi-colored dots in shades of red, blue, green, yellow, and purple. The text "THANK YOU FOR WATCHING" is centered in a bold, black, sans-serif font.

**THANK YOU FOR WATCHING**