LangChain会拦截异常并提醒模型重试。

2. StructuredOutputValidationError

输出结构化验证错误，当输出格式不符合结构化要求时，抛出上述异常。

默认情况下LangChain会拦截该异常并自动重试。

In [12]:
```
from pydantic import BaseModel, Field
from typing import Union
from langchain.agents import create_agent
from langchain.agents.structured_output import
ToolStrategy,StructuredOutputValidationError, MultipleStructuredOutputsError
from rich import print as rprint

class ContactInfo(BaseModel):
    """个人联系信息"""
    name: str = Field(description="姓名")
    email: str = Field(description="电子邮箱")

class EventDetails(BaseModel):
    """活动详情"""
    event_name: str = Field(description="活动名称")
    date: str = Field(description="活动日期")

agent = create_agent(
    model=model_bailian,
    response_format=ToolStrategy(
        Union[ContactInfo, EventDetails],
        tool_message_content="提取完成！",
        handle_errors=(MultipleStructuredOutputsError,StructuredOutputValidationError)
        # handle_errors=(StructuredOutputValidationError)
    )
)

result = agent.invoke({
    "messages": [{
        "role": "user",
        "content": f"请提取以下文本中内容：姓名：张三，电子邮箱：zhang3@atguigu.com，活动名称：公司年会，活动日期：2026-07-15"
    }]
})

rprint(result)
```

```
{
    'messages': [
        HumanMessage(
            content='请提取以下文本中内容：姓名：张三，电子邮箱：
zhang3@atguigu.com，活动名称：公司年会，活动日期：
2026-07-15',
            additional_kwargs={},
            response_metadata={},
            id='19867dd3-9416-417a-8d50-34efeba1c5f9'
        ),
        AIMessage(
            content='',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 118,
                    'prompt_tokens': 404,
                    'total_tokens': 522,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 256}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-c77025e5-ee17-9fad-a0b0-
c527c2820b12',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff64a-6a63-7f03-bed4-872e086b09cc-0',
            tool_calls=[
                {
                    'name': 'ContactInfo',
                    'args': {'email': 'zhang3@atguigu.com', 'name':
'张三'},
                    'id': 'call_d1befaa0b21c4bf2948834e6',
                    'type': 'tool_call'
                },
                {
                    'name': 'EventDetails',
                    'args': {'date': '2026-07-15', 'event_name': '公
司年会'},
                    'id': 'call_0282ceb1c4714da1947b3830',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 404,
                'output_tokens': 118,
                'total_tokens': 522,
                'input_token_details': {'cache_read': 256},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='Error: Model incorrectly returned multiple
structured responses (ContactInfo, EventDetails)
when only one is expected.\n Please fix your mistakes.',
            name='ContactInfo',
            id='e2c8f8b6-47a4-46c0-9210-4c24093c993f',
            tool_call_id='call_d1befaa0b21c4bf2948834e6'
```

```
        ),
        ToolMessage(
            content='Error: Model incorrectly returned multiple
structured responses (ContactInfo, EventDetails)
when only one is expected.\n Please fix your mistakes.',
            name='EventDetails',
            id='22749292-494b-465b-aa89-1ffbde310134',
            tool_call_id='call_0282ceb1c4714da1947b3830'
        ),
        AIMessage(
            content='',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 65,
                    'prompt_tokens': 593,
                    'total_tokens': 658,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 512}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-01c85472-06a2-98b3-8196-
07992ba26c54',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff64a-6e95-7e33-a49a-7e721f789417-0',
            tool_calls=[
                {
                    'name': 'ContactInfo',
                    'args': {'email': 'zhang3@atguigu.com', 'name':
'张三'},
                    'id': 'call_f21f33d31bc54a4fbcfaf8f1',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 593,
                'output_tokens': 65,
                'total_tokens': 658,
                'input_token_details': {'cache_read': 512},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='提取完成！',
            name='ContactInfo',
            id='e4196950-fe4c-4c62-b187-9e52b74c3302',
            tool_call_id='call_f21f33d31bc54a4fbcfaf8f1'
        )
    ],
    'structured_response': ContactInfo(name='张三',
email='zhang3@atguigu.com')
}
```

情况3：设置为自定义错误处理函数

指定异常处理函数并返回字符串时，LangChain会在遇到异常时自动重试并将异常处理函数的返回值作为ToolMessage的内容。

我们也可以选择在异常处理函数中抛出异常。

In [13]:
```
from pydantic import BaseModel, Field
from typing import Union
from langchain.agents import create_agent
from langchain.agents.structured_output import
ToolStrategy,StructuredOutputValidationError, MultipleStructuredOutputsError
from rich import print as rprint

# 自定义错误处理函数
def custom_error_handler(error: Exception) -> str:
  """自定义错误处理器"""
  error_str = str(error)

  print(f"捕获到错误类型：{type(error).__name__}")
  print(f"错误详情：{error_str}")

  if isinstance(error, StructuredOutputValidationError):
    return "数据格式有误，请检查字段是否符合要求。"
  elif isinstance(error, MultipleStructuredOutputsError):
    return "检测到多个响应，请选择最相关的一个进行返回。"
  else:
    return f"Error: {error_str}"

class ContactInfo(BaseModel):
  """个人联系信息"""
  name: str = Field(description="姓名")
  email: str = Field(description="电子邮箱")

class EventDetails(BaseModel):
  """活动详情"""
  event_name: str = Field(description="活动名称")
  date: str = Field(description="活动日期")

agent = create_agent(
  model=model_bailian,
  response_format=ToolStrategy(
  Union[ContactInfo, EventDetails],
  tool_message_content="提取完成！",
  handle_errors=custom_error_handler
  )
)
result = agent.invoke({
  "messages": [{
    "role": "user",
    "content": f"请提取以下文本中内容：姓名：张三，电子邮箱：zhang3@atguigu.com，活动名称：公司年会，活动日期：2026-07-15"
  }]
})

rprint(result)
```

```
捕获到错误类型：MultipleStructuredOutputsError
错误详情：Model incorrectly returned multiple structured responses (ContactInfo, EventDetails) when only one is expected.
```

```
{
    'messages': [
        HumanMessage(
            content='请提取以下文本中内容：姓名：张三，电子邮箱：
zhang3@atguigu.com，活动名称：公司年会，活动日期：
2026-07-15',
            additional_kwargs={},
            response_metadata={},
            id='d5807607-776b-4ec3-ba5c-2c9330b73707'
        ),
        AIMessage(
            content='',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 118,
                    'prompt_tokens': 404,
                    'total_tokens': 522,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 256}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-d5e9f3bd-8790-931c-b44a-
814c6387ef68',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff64d-4a0c-76c2-adfa-a6d623070f14-0',
            tool_calls=[
                {
                    'name': 'ContactInfo',
                    'args': {'email': 'zhang3@atguigu.com', 'name':
'张三'},
                    'id': 'call_9df1d40e28e24b4c8ccb7e8c',
                    'type': 'tool_call'
                },
                {
                    'name': 'EventDetails',
                    'args': {'date': '2026-07-15', 'event_name': '公
司年会'},
                    'id': 'call_8d309e7d64234b62b253d087',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 404,
                'output_tokens': 118,
                'total_tokens': 522,
                'input_token_details': {'cache_read': 256},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='检测到多个响应，请选择最相关的一个进行返回。',
            name='ContactInfo',
            id='a0cf02da-bfea-4f1e-acb3-253cd1cc66cc',
            tool_call_id='call_9df1d40e28e24b4c8ccb7e8c'
        ),
        ToolMessage(
```

```
            content='检测到多个响应，请选择最相关的一个进行返回。',
            name='EventDetails',
            id='dfa78d9a-691c-41be-b5c6-56d6b28ed72b',
            tool_call_id='call_8d309e7d64234b62b253d087'
        ),
        AIMessage(
            content='',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 65,
                    'prompt_tokens': 567,
                    'total_tokens': 632,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 512}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-8abb13c5-f617-91b8-80fd-
d03fbd9e0461',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff64d-4de1-71f3-9eea-a6970a19e0f6-0',
            tool_calls=[
                {
                    'name': 'ContactInfo',
                    'args': {'email': 'zhang3@atguigu.com', 'name':
'张三'},
                    'id': 'call_73fcb112568e4dabb47b9de0',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 567,
                'output_tokens': 65,
                'total_tokens': 632,
                'input_token_details': {'cache_read': 512},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='提取完成！',
            name='ContactInfo',
            id='3a12bd45-38cb-472b-aee1-1e7bd55e8fa8',
            tool_call_id='call_73fcb112568e4dabb47b9de0'
        )
    ],
    'structured_response': ContactInfo(name='张三',
email='zhang3@atguigu.com')
}
```

8.Agent的高级用法4：流式输出及模式

8.1 流式输出的说明

通过invoke 调用Agent时，内部可能经历多次调用，长时间看不到调用情况，用户体验不好，可以通过流式调用（渐进式显示输出）优化用户体验， 实时显示 Agent 运行过程中的更新。特别是在处理LLM 延迟时尤其有效。
流式输出好处：

- 大型语言模型生成完整响应通常需要几秒钟时间，对于长输出可能达到10-20 秒，用户期望即时反馈， 流式传输让等待过程更加可控。
- 相比非流式传输需要用户长时间等待完整响应，流式传输可以立即显示文字逐渐出现的效果， 大幅降低用户的等待焦虑。

设置方式：
通过“ agent.stream(stream_mode=指定模式) ”来指定。具体模式有：values、updates（默认）、messages、custom、checkpoints、tasks、debug。

8.2 具体的输出模式

1）values输出模式

当stream_mode 设置为values模式时，每个步骤执行后，都会输出完整的状态信息，适用于每一步都要获取完整状态、状态持久化场景。
举例：

In [15]:
```
from langchain.chat_models import init_chat_model
from dotenv import load_dotenv
import os

load_dotenv(override=True)

# 1.模型初始化
model = init_chat_model(
  model="deepseek-v4-flash-0731",
  model_provider="openai",
  api_key=os.getenv("DASHSCOPE_API_KEY"),
  base_url=os.getenv("DASHSCOPE_BASE_URL"),
  extra_body={
    "thinking":{
      "type":"disabled"
    }
  }
)
```

In [16]:
```
from langchain.agents import create_agent
from langchain.tools import tool
from typing import Dict, Any
from rich import print as rprint
@tool
def query_customer_data(customer_id: str) -> Dict[str, Any]:
  """
  查询客户基本信息

  Args:
    customer_id: 客户ID，用于唯一标识客户

  Returns:
```

```
    包含客户基本信息的字典，如姓名、等级、加入日期等
  """
  # 模拟数据库查询
  return {"name": "张三","level": "VIP","join_date": "2023-01-15"}

@tool
def check_order_history(customer_id: str) -> Dict[str, Any]:
  """
  查询客户订单历史

  Args:
    customer_id: 客户ID，用于唯一标识客户

  Returns:
    包含客户订单历史的字典，如总订单数、总花费等
  """
  return {"total_orders": 15,"total_spent": 25800.00}

@tool
def get_current_promotions() -> Dict[str, Any]:
  """
  获取当前可用促销活动

  Returns:
    包含当前可用促销活动的字典，如活动名称、有效日期等
  """
  return {
    "promotions": ["老用户优惠", "会员专属折扣"],
    "valid_until": "2027-01-31"
  }

# 创建客户服务Agent
customer_service_agent = create_agent(
  model=model,
  tools=[query_customer_data, check_order_history, get_current_promotions]
)

for chunk in customer_service_agent.stream(
  {"messages": [{"role": "user","content": "查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠"}]},
  stream_mode="values"
):
  rprint(chunk)
  print("-" * 50)
```

```
{
    'messages': [
        HumanMessage(
            content='查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠',
            additional_kwargs={},
            response_metadata={},
            id='de32cad4-ac44-4dbf-8e15-57e80e158835'
        )
    ]
}
--------------------------------------------------
```

```
{
    'messages': [
        HumanMessage(
            content='查询客户ID为 CUST123456 的个人信息、历史订单和可用优
惠',
            additional_kwargs={},
            response_metadata={},
            id='de32cad4-ac44-4dbf-8e15-57e80e158835'
        ),
        AIMessage(
            content='我来为您查询客户 CUST123456 的个人信息、历史订单和可用
优惠信息。\n\n',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 120,
                    'prompt_tokens': 467,
                    'total_tokens': 587,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 0}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-7142666a-bdbe-9637-9478-
c71497d9ae29',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff653-b620-7a60-bfb6-0b8b9e9b668c-0',
            tool_calls=[
                {
                    'name': 'query_customer_data',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_beaf30b80b904596949fcbde',
                    'type': 'tool_call'
                },
                {
                    'name': 'check_order_history',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_9a9b6e6a35ed459c99b0c13c',
                    'type': 'tool_call'
                },
                {
                    'name': 'get_current_promotions',
                    'args': {},
                    'id': 'call_d03302c7cbd04aaba3404e43',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 467,
                'output_tokens': 120,
                'total_tokens': 587,
                'input_token_details': {'cache_read': 0},
                'output_token_details': {}
            }
        )
    ]
}
```

```
{
    'messages': [
        HumanMessage(
            content='查询客户ID为 CUST123456 的个人信息、历史订单和可用优
惠',
            additional_kwargs={},
            response_metadata={},
            id='de32cad4-ac44-4dbf-8e15-57e80e158835'
        ),
        AIMessage(
            content='我来为您查询客户 CUST123456 的个人信息、历史订单和可用
优惠信息。\n\n',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 120,
                    'prompt_tokens': 467,
                    'total_tokens': 587,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 0}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-7142666a-bdbe-9637-9478-
c71497d9ae29',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff653-b620-7a60-bfb6-0b8b9e9b668c-0',
            tool_calls=[
                {
                    'name': 'query_customer_data',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_beaf30b80b904596949fcbde',
                    'type': 'tool_call'
                },
                {
                    'name': 'check_order_history',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_9a9b6e6a35ed459c99b0c13c',
                    'type': 'tool_call'
                },
                {
                    'name': 'get_current_promotions',
                    'args': {},
                    'id': 'call_d03302c7cbd04aaba3404e43',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 467,
                'output_tokens': 120,
                'total_tokens': 587,
                'input_token_details': {'cache_read': 0},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='{"name": "张三", "level": "VIP", "join_date":
"2023-01-15"}',
```

```
            name='query_customer_data',
            id='d01fdfd8-9385-4b71-b969-9437497d22d6',
            tool_call_id='call_beaf30b80b904596949fcbde'
        ),
        ToolMessage(
            content='{"total_orders": 15, "total_spent": 25800.0}',
            name='check_order_history',
            id='15301d67-7413-46cf-8560-f7e3e9c6fb06',
            tool_call_id='call_9a9b6e6a35ed459c99b0c13c'
        ),
        ToolMessage(
            content='{"promotions": ["老用户优惠", "会员专属折扣"],
"valid_until": "2027-01-31"}',
            name='get_current_promotions',
            id='c73dbc4e-3561-49aa-93cd-19074df7c225',
            tool_call_id='call_d03302c7cbd04aaba3404e43'
        )
    ]
}
 ----------------------------------------------
```

```
{
    'messages': [
        HumanMessage(
            content='查询客户ID为 CUST123456 的个人信息、历史订单和可用优
惠',
            additional_kwargs={},
            response_metadata={},
            id='de32cad4-ac44-4dbf-8e15-57e80e158835'
        ),
        AIMessage(
            content='我来为您查询客户 CUST123456 的个人信息、历史订单和可用
优惠信息。\n\n',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 120,
                    'prompt_tokens': 467,
                    'total_tokens': 587,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 0}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-7142666a-bdbe-9637-9478-
c71497d9ae29',
                'finish_reason': 'tool_calls',
                'logprobs': None
            },
            id='lc_run--019ff653-b620-7a60-bfb6-0b8b9e9b668c-0',
            tool_calls=[
                {
                    'name': 'query_customer_data',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_beaf30b80b904596949fcbde',
                    'type': 'tool_call'
                },
                {
                    'name': 'check_order_history',
                    'args': {'customer_id': 'CUST123456'},
                    'id': 'call_9a9b6e6a35ed459c99b0c13c',
                    'type': 'tool_call'
                },
                {
                    'name': 'get_current_promotions',
                    'args': {},
                    'id': 'call_d03302c7cbd04aaba3404e43',
                    'type': 'tool_call'
                }
            ],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 467,
                'output_tokens': 120,
                'total_tokens': 587,
                'input_token_details': {'cache_read': 0},
                'output_token_details': {}
            }
        ),
        ToolMessage(
            content='{"name": "张三", "level": "VIP", "join_date":
"2023-01-15"}',
```

```
            name='query_customer_data',
            id='d01fdfd8-9385-4b71-b969-9437497d22d6',
            tool_call_id='call_beaf30b80b904596949fcbde'
        ),
        ToolMessage(
            content='{"total_orders": 15, "total_spent": 25800.0}',
            name='check_order_history',
            id='15301d67-7413-46cf-8560-f7e3e9c6fb06',
            tool_call_id='call_9a9b6e6a35ed459c99b0c13c'
        ),
        ToolMessage(
            content='{"promotions": ["老用户优惠", "会员专属折扣"],
"valid_until": "2027-01-31"}',
            name='get_current_promotions',
            id='c73dbc4e-3561-49aa-93cd-19074df7c225',
            tool_call_id='call_d03302c7cbd04aaba3404e43'
        ),
        AIMessage(
            content='我已经为您查询到了客户 CUST123456 的全部信息，以下是详
细汇总：\n\n## 📋 客户个人信息\n| 项目 |
详情 |\n|------|------|\n| **姓名** | 张三 |\n| **客户等级** | VIP |\n|
**加入日期** | 2023-01-15 |\n\n## 🛒
订单历史\n| 项目 | 详情 |\n|------|------|\n| **总订单数** | 15 笔 |\n|
**总消费金额** | ¥25,800.00 |\n\n## 🎁
可用优惠\n| 项目 | 详情 |\n|------|------|\n| **可用优惠活动** | 老用户优
惠、会员专属折扣 |\n| **有效期至** |
2027-01-31 |\n\n---\n\n**总结：**
张三先生是VIP等级客户，自2023年1月加入以来共消费15笔、总计¥25,800，目前可享
受"老用户优惠"和"会员专属折扣"两项优惠活
动，有效期至2027年1月31日。\n\n如需进一步了解某个特定优惠的具体内容，或查询其他
信息，请随时告诉我！',
            additional_kwargs={'refusal': None},
            response_metadata={
                'token_usage': {
                    'completion_tokens': 240,
                    'prompt_tokens': 684,
                    'total_tokens': 924,
                    'completion_tokens_details': None,
                    'prompt_tokens_details': {'audio_tokens': None,
'cached_tokens': 0}
                },
                'model_provider': 'openai',
                'model_name': 'deepseek-v4-flash-0731',
                'system_fingerprint': None,
                'id': 'chatcmpl-2b23d623-a582-9c8f-9ed7-
d733380aa3b5',
                'finish_reason': 'stop',
                'logprobs': None
            },
            id='lc_run--019ff653-bc55-7150-a204-2a6e77862535-0',
            tool_calls=[],
            invalid_tool_calls=[],
            usage_metadata={
                'input_tokens': 684,
                'output_tokens': 240,
                'total_tokens': 924,
                'input_token_details': {'cache_read': 0},
                'output_token_details': {}
            }
        )
```

```
    ]
}
----------------------------------------------------
```

代码运行后示意结果如下：

```
{'messages': [HumanMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...)]}
----------------------------------------------------
{'messages': [HumanMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...), ToolMessage(...), AIMessage(...)]}
----------------------------------------------------
```

3）updates输出模式

这种模式就是默认模式。该模式中，每个步骤执行后，只增量更新状态中发生变化的内容，用于监控Agent 执行进度，例如观察Agent决定调用工具、工具执行结果等步骤。代码如下：

In [17]:
```python
from langchain.agents import create_agent
from langchain.tools import tool
from typing import Dict, Any
from rich import print as rprint
@tool
def query_customer_data(customer_id: str) -> Dict[str, Any]:
    """
    查询客户基本信息

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户基本信息的字典，如姓名、等级、加入日期等
    """
    # 模拟数据库查询
    return {"name": "张三","level": "VIP","join_date": "2023-01-15"}

@tool
def check_order_history(customer_id: str) -> Dict[str, Any]:
    """
    查询客户订单历史

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户订单历史的字典，如总订单数、总花费等
    """
    return {"total_orders": 15,"total_spent": 25800.00}

@tool
def get_current_promotions() -> Dict[str, Any]:
    """
    获取当前可用促销活动

    Returns:
        包含当前可用促销活动的字典，如活动名称、有效日期等
```

```
    """
    return {
        "promotions": ["老用户优惠", "会员专属折扣"],
        "valid_until": "2027-01-31"
    }

# 创建客户服务Agent
customer_service_agent = create_agent(
    model=model,
    tools=[query_customer_data, check_order_history, get_current_promotions]
)

for chunk in customer_service_agent.stream(
    {"messages": [{"role": "user","content": "查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠"}]},
    stream_mode="updates"
):
    rprint(chunk)
    print("-" * 50)
```

```
{
    'model': {
        'messages': [
            AIMessage(
                content='我来为您查询客户 CUST123456
的相关信息。我将同时查询客户基本信息、订单历史和当前可用优惠。\n\n',
                additional_kwargs={'refusal': None},
                response_metadata={
                    'token_usage': {
                        'completion_tokens': 125,
                        'prompt_tokens': 467,
                        'total_tokens': 592,
                        'completion_tokens_details': None,
                        'prompt_tokens_details': {'audio_tokens':
None, 'cached_tokens': 0}
                    },
                    'model_provider': 'openai',
                    'model_name': 'deepseek-v4-flash-0731',
                    'system_fingerprint': None,
                    'id': 'chatcmpl-dd0f8f7c-4520-9504-b46b-
9ac39ab94eff',
                    'finish_reason': 'tool_calls',
                    'logprobs': None
                },
                id='lc_run--019ff655-eb63-70f1-ba2d-47bd95962cdb-0',
                tool_calls=[
                    {
                        'name': 'query_customer_data',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_c3610bfa09f94dda961752db',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'check_order_history',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_8a391da0f8744ef3a2e28984',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'get_current_promotions',
                        'args': {},
                        'id': 'call_75db0b3b4b9440d1af7ace1f',
                        'type': 'tool_call'
                    }
                ],
                invalid_tool_calls=[],
                usage_metadata={
                    'input_tokens': 467,
                    'output_tokens': 125,
                    'total_tokens': 592,
                    'input_token_details': {'cache_read': 0},
                    'output_token_details': {}
                }
            )
        ]
    }
}
```

```
{
    'tools': {
        'messages': [
            ToolMessage(
                content='{"name": "张三", "level": "VIP",
"join_date": "2023-01-15"}',
                name='query_customer_data',
                id='73cb7caf-fbe4-4fb5-a465-32e016cc69f8',
                tool_call_id='call_c3610bfa09f94dda961752db'
            )
        ]
    }
}

--------------------------------------------
{
    'tools': {
        'messages': [
            ToolMessage(
                content='{"total_orders": 15, "total_spent":
25800.0}',
                name='check_order_history',
                id='59726f5c-6f0e-477b-85a2-28982347738b',
                tool_call_id='call_8a391da0f8744ef3a2e28984'
            )
        ]
    }
}

--------------------------------------------
{
    'tools': {
        'messages': [
            ToolMessage(
                content='{"promotions": ["老用户优惠", "会员专属折扣"],
"valid_until": "2027-01-31"}',
                name='get_current_promotions',
                id='6463e3cc-c8a9-4abf-95df-cde711b9e8b2',
                tool_call_id='call_75db0b3b4b9440d1af7ace1f'
            )
        ]
    }
}

--------------------------------------------
```

```
{
    'model': {
        'messages': [
            AIMessage(
                content='我已成功查询到客户 CUST123456 的相关信息，以下是详细汇总：\n\n---\n\n### 👤 客户个人信息\n| 项目 | 信息 |\n|------|------|\n| **姓名** | 张三 |\n| **会员等级** | VIP |\n| **加入日期** | 2023-01-15 |\n\n---\n\n### 📦 订单历史\n| 项目 | 信息 |\n|------|------|\n| **总订单数** | 15 笔 |\n| **累计消费金额** | ¥25,800.00 |\n\n---\n\n### 🎁 当前可用优惠\n| 优惠活动 | 有效期 |\n|----------|--------|\n| 老用户优惠 | 至 2027-01-31 |\n| 会员专属折扣 | 至 2027-01-31 |\n\n---\n\n**总结：** 客户张三是一位 **VIP 会员**，自 2023 年 1 月加入以来累计下单 15 笔，总消费 ¥25,800。目前可享受两项优惠活动（老用户优惠和会员专属折扣），两项优惠均有效至 2027 年 1 月 31 日。\n\n如需更多信息或进行其他操作，请随时告知！',
                additional_kwargs={'refusal': None},
                response_metadata={
                    'token_usage': {
                        'completion_tokens': 255,
                        'prompt_tokens': 689,
                        'total_tokens': 944,
                        'completion_tokens_details': None,
                        'prompt_tokens_details': {'audio_tokens': None, 'cached_tokens': 0}
                    },
                    'model_provider': 'openai',
                    'model_name': 'deepseek-v4-flash-0731',
                    'system_fingerprint': None,
                    'id': 'chatcmpl-6d70e3ad-b6bb-93d4-9624-13ca18b3219a',
                    'finish_reason': 'stop',
                    'logprobs': None
                },
                id='lc_run--019ff655-f2ce-7f61-bb84-1fcee0f68625-0',
                tool_calls=[],
                invalid_tool_calls=[],
                usage_metadata={
                    'input_tokens': 689,
                    'output_tokens': 255,
                    'total_tokens': 944,
                    'input_token_details': {'cache_read': 0},
                    'output_token_details': {}
                }
            )
        ]
    }
}
```

运行结果如下：

```
{'model': {'messages': [AIMessage(content='我来帮您查询客户CUST123456的完整信息和当前可用优惠。让我先获取客户的基本信息。', additional_kwargs={'refusal': None}, response
--------------------------------------------------
{'tools': {'messages': [ToolMessage(content='{"name": "张三", "level": "VIP", "join_date": "2023-01-15"}', name='query_customer_data', id='61238935-f850-4838-
--------------------------------------------------
{'model': {'messages': [AIMessage(content='现在让我查询该客户的订单历史：', additional_kwargs={'refusal': None}, response_metadata={'token_usage': {'completion_to
--------------------------------------------------
{'tools': {'messages': [ToolMessage(content='{"total_orders": 15, "total_spent": 25800.0}', name='check_order_history', id='41aca09f-d73c-4d71-8f9f-8e9ce28b2
--------------------------------------------------
{'model': {'messages': [AIMessage(content='接下来让我获取当前可用的促销活动：', additional_kwargs={'refusal': None}, response_metadata={'token_usage': {'completion
--------------------------------------------------
{'tools': {'messages': [ToolMessage(content='{"promotions": ["老用户优惠", "会员专属折扣"], "valid_until": "2027-01-31"}', name='get_current_promotions', id='124
--------------------------------------------------
{'model': {'messages': [AIMessage(content='根据查询结果，以下是客户CUST123456的完整信息和可用优惠：\n\n## 客户基本信息\n- **客户ID**: CUST123456\n- **姓名**: 张三\n- **会
--------------------------------------------------
```

3）messages输出模式

该模式中会输出流式返回的Token以及相关的元数据（如：来自哪个节点），可以用在实现类似ChatGPT 的打字机效果场景，为聊天机器人等交互式应用提供最佳的实时体验。
代码如下：

In [19]:
```python
from langchain.agents import create_agent
from langchain.tools import tool
from typing import Dict, Any
from rich import print as rprint
@tool
def query_customer_data(customer_id: str) -> Dict[str, Any]:
    """
    查询客户基本信息

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户基本信息的字典，如姓名、等级、加入日期等
    """
    # 模拟数据库查询
    return {"name": "张三","level": "VIP","join_date": "2023-01-15"}

@tool
def check_order_history(customer_id: str) -> Dict[str, Any]:
    """
    查询客户订单历史

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户订单历史的字典，如总订单数、总花费等
    """
    return {"total_orders": 15,"total_spent": 25800.00}

@tool
def get_current_promotions() -> Dict[str, Any]:
    """
    获取当前可用促销活动

    Returns:
        包含当前可用促销活动的字典，如活动名称、有效日期等
    """
    return {
        "promotions": ["老用户优惠", "会员专属折扣"],
```

```
    "valid_until": "2027-01-31"
  }

# 创建客户服务Agent
customer_service_agent = create_agent(
  model=model,
  tools=[query_customer_data, check_order_history, get_current_promotions]
)

for chunk in customer_service_agent.stream(
  {"messages": [{"role": "user","content": "查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠"}]},
  stream_mode="messages"
):
  # rprint(chunk)
  # print("-" * 50)
  print(chunk[0].content,end="",flush=True)
```

我来为您查询客户 CUST123456 的个人信息、历史订单和可用优惠信息。让我同时发起这些查询。

{"name": "张三", "level": "VIP", "join_date": "2023-01-15"}{"total_orders": 15, "total_spent": 25800.0}{"promotions": ["老用户优惠", "会员专属折扣"], "valid_until": "2027-01-31"}我已成功查询到客户 CUST123456 的相关信息，以下是详细结果：

📋 客户个人信息
项目	详情
姓名	张三
会员等级	VIP
加入日期	2023年1月15日

🛒 历史订单信息
项目	详情
总订单数	15 笔
累计消费	¥25,800.00

🎁 可用优惠活动
项目	详情
可用优惠	老用户优惠、会员专属折扣
有效期至	2027年1月31日

总结： 客户张三是VIP会员，自2023年加入以来共完成15笔订单，累计消费25,800元。目前可享受"老用户优惠"和"会员专属折扣"两项优惠，有效期至2027年1月底。

如需进一步查询或操作，请随时告诉我！

4）tasks输出模式

该模式会输出当前task任务开始和结束的时间，包含任务的结果和错误信息，该模式用于监控任务的生命周期。
代码如下：

In [20]:
```
from langchain.agents import create_agent
from langchain.tools import tool
```

```python
from typing import Dict, Any
from rich import print as rprint
@tool
def query_customer_data(customer_id: str) -> Dict[str, Any]:
    """
    查询客户基本信息

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户基本信息的字典，如姓名、等级、加入日期等
    """
    # 模拟数据库查询
    return {"name": "张三","level": "VIP","join_date": "2023-01-15"}

@tool
def check_order_history(customer_id: str) -> Dict[str, Any]:
    """
    查询客户订单历史

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户订单历史的字典，如总订单数、总花费等
    """
    return {"total_orders": 15,"total_spent": 25800.00}

@tool
def get_current_promotions() -> Dict[str, Any]:
    """
    获取当前可用促销活动

    Returns:
        包含当前可用促销活动的字典，如活动名称、有效日期等
    """
    return {
        "promotions": ["老用户优惠", "会员专属折扣"],
        "valid_until": "2027-01-31"
    }

# 创建客户服务Agent
customer_service_agent = create_agent(
    model=model,
    tools=[query_customer_data, check_order_history, get_current_promotions]
)

for chunk in customer_service_agent.stream(
    {"messages": [{"role": "user","content": "查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠"}]},
    stream_mode="tasks"
):
    rprint(chunk)
    print("-" * 50)
```

```
{
    'id': '5abf172f-d530-f4cc-6ae3-5b9c51788073',
    'name': 'model',
    'input': {
        'messages': [
            HumanMessage(
                content='查询客户ID为 CUST123456 的个人信息、历史订单和可
用优惠',
                additional_kwargs={},
                response_metadata={},
                id='cc503bf0-acae-41ef-bf20-cc152b9296fd'
            )
        ]
    },
    'triggers': ('branch:to:model',)
}
 ----------
```

```
{
    'id': '5abf172f-d530-f4cc-6ae3-5b9c51788073',
    'name': 'model',
    'error': None,
    'result': {
        'messages': [
            AIMessage(
                content='我来帮您查询客户 CUST123456
的个人信息、历史订单和可用优惠。这三个查询是独立的，我将同时进行查询',
                additional_kwargs={'refusal': None},
                response_metadata={
                    'token_usage': {
                        'completion_tokens': 130,
                        'prompt_tokens': 467,
                        'total_tokens': 597,
                        'completion_tokens_details': None,
                        'prompt_tokens_details': {'audio_tokens':
None, 'cached_tokens': 0}
                    },
                    'model_provider': 'openai',
                    'model_name': 'deepseek-v4-flash-0731',
                    'system_fingerprint': None,
                    'id': 'chatcmpl-050cdd80-6a88-90d7-a003-
e9bbef0dd06c',
                    'finish_reason': 'tool_calls',
                    'logprobs': None
                },
                id='lc_run--019ff659-3d22-75c3-a031-b10e0265a688-0',
                tool_calls=[
                    {
                        'name': 'query_customer_data',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_4ba175f4d1be470099640739',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'check_order_history',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_0fc49e45b1fd4432b268d94a',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'get_current_promotions',
                        'args': {},
                        'id': 'call_77a08215fce9428d8bf96a5f',
                        'type': 'tool_call'
                    }
                ],
                invalid_tool_calls=[],
                usage_metadata={
                    'input_tokens': 467,
                    'output_tokens': 130,
                    'total_tokens': 597,
                    'input_token_details': {'cache_read': 0},
                    'output_token_details': {}
                }
            )
        ]
    },
    'interrupts': []
}
```

```
{
    'id': 'bf5bf44a-fd3a-5e93-e6a3-39071c79927c',
    'name': 'tools',
    'input': {
        '__type': 'tool_call_with_context',
        'tool_call': {
            'name': 'query_customer_data',
            'args': {'customer_id': 'CUST123456'},
            'id': 'call_4ba175f4d1be470099640739',
            'type': 'tool_call'
        },
        'state': {
            'messages': [
                HumanMessage(
                    content='查询客户ID为 CUST123456 的个人信息、历史订单
和可用优惠',
                    additional_kwargs={},
                    response_metadata={},
                    id='cc503bf0-acae-41ef-bf20-cc152b9296fd'
                ),
                AIMessage(
                    content='我来帮您查询客户 CUST123456
的个人信息、历史订单和可用优惠。这三个查询是独立的，我将同时进行查询',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 130,
                            'prompt_tokens': 467,
                            'total_tokens': 597,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-050cdd80-6a88-90d7-a003-
e9bbef0dd06c',
                        'finish_reason': 'tool_calls',
                        'logprobs': None
                    },
                    id='lc_run--019ff659-3d22-75c3-a031-
b10e0265a688-0',
                    tool_calls=[
                        {
                            'name': 'query_customer_data',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_4ba175f4d1be470099640739',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'check_order_history',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_0fc49e45b1fd4432b268d94a',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'get_current_promotions',
                            'args': {},
                            'id': 'call_77a08215fce9428d8bf96a5f',
                            'type': 'tool_call'
                        }
                    ],
```

```
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 467,
                        'output_tokens': 130,
                        'total_tokens': 597,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                )
            ]
        }
    },
    'triggers': ('__pregel_push',)
}
```

```
{
    'id': '95521535-b010-7ef2-2f70-f8337c5f470e',
    'name': 'tools',
    'input': {
        '__type': 'tool_call_with_context',
        'tool_call': {
            'name': 'check_order_history',
            'args': {'customer_id': 'CUST123456'},
            'id': 'call_0fc49e45b1fd4432b268d94a',
            'type': 'tool_call'
        },
        'state': {
            'messages': [
                HumanMessage(
                    content='查询客户ID为 CUST123456 的个人信息、历史订单
和可用优惠',
                    additional_kwargs={},
                    response_metadata={},
                    id='cc503bf0-acae-41ef-bf20-cc152b9296fd'
                ),
                AIMessage(
                    content='我来帮您查询客户 CUST123456
的个人信息、历史订单和可用优惠。这三个查询是独立的，我将同时进行查询',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 130,
                            'prompt_tokens': 467,
                            'total_tokens': 597,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-050cdd80-6a88-90d7-a003-
e9bbef0dd06c',
                        'finish_reason': 'tool_calls',
                        'logprobs': None
                    },
                    id='lc_run--019ff659-3d22-75c3-a031-
b10e0265a688-0',
                    tool_calls=[
                        {
                            'name': 'query_customer_data',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_4ba175f4d1be470099640739',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'check_order_history',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_0fc49e45b1fd4432b268d94a',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'get_current_promotions',
                            'args': {},
                            'id': 'call_77a08215fce9428d8bf96a5f',
                            'type': 'tool_call'
                        }
                    ],
```

```
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 467,
                        'output_tokens': 130,
                        'total_tokens': 597,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                )
            ]
        }
    },
    'triggers': ('__pregel_push',)
}
```

```
{
    'id': '7ef8e151-3b6c-46b3-d2d6-cb41200b82a8',
    'name': 'tools',
    'input': {
        '__type': 'tool_call_with_context',
        'tool_call': {
            'name': 'get_current_promotions',
            'args': {},
            'id': 'call_77a08215fce9428d8bf96a5f',
            'type': 'tool_call'
        },
        'state': {
            'messages': [
                HumanMessage(
                    content='查询客户ID为 CUST123456 的个人信息、历史订单
和可用优惠',
                    additional_kwargs={},
                    response_metadata={},
                    id='cc503bf0-acae-41ef-bf20-cc152b9296fd'
                ),
                AIMessage(
                    content='我来帮您查询客户 CUST123456
的个人信息、历史订单和可用优惠。这三个查询是独立的，我将同时进行查询',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 130,
                            'prompt_tokens': 467,
                            'total_tokens': 597,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-050cdd80-6a88-90d7-a003-
e9bbef0dd06c',
                        'finish_reason': 'tool_calls',
                        'logprobs': None
                    },
                    id='lc_run--019ff659-3d22-75c3-a031-
b10e0265a688-0',
                    tool_calls=[
                        {
                            'name': 'query_customer_data',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_4ba175f4d1be470099640739',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'check_order_history',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_0fc49e45b1fd4432b268d94a',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'get_current_promotions',
                            'args': {},
                            'id': 'call_77a08215fce9428d8bf96a5f',
                            'type': 'tool_call'
                        }
                    ],
```

```
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 467,
                        'output_tokens': 130,
                        'total_tokens': 597,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                )
            ]
        }
    },
    'triggers': ('__pregel_push',)
}

 ---------------------------------------------
{
    'id': 'bf5bf44a-fd3a-5e93-e6a3-39071c79927c',
    'name': 'tools',
    'error': None,
    'result': {
        'messages': [
            ToolMessage(
                content='{"name": "张三", "level": "VIP",
"join_date": "2023-01-15"}',
                name='query_customer_data',
                id='ff09b75f-4cda-4657-b417-0385d6d7de24',
                tool_call_id='call_4ba175f4d1be470099640739'
            )
        ]
    },
    'interrupts': []
}

 ---------------------------------------------
{
    'id': '95521535-b010-7ef2-2f70-f8337c5f470e',
    'name': 'tools',
    'error': None,
    'result': {
        'messages': [
            ToolMessage(
                content='{"total_orders": 15, "total_spent":
25800.0}',
                name='check_order_history',
                id='7c434a02-ec08-41f5-8236-73db63b809bb',
                tool_call_id='call_0fc49e45b1fd4432b268d94a'
            )
        ]
    },
    'interrupts': []
}

 ---------------------------------------------
```

```
{
    'id': '7ef8e151-3b6c-46b3-d2d6-cb41200b82a8',
    'name': 'tools',
    'error': None,
    'result': {
        'messages': [
            ToolMessage(
                content='{"promotions": ["老用户优惠", "会员专属折扣"],
"valid_until": "2027-01-31"}',
                name='get_current_promotions',
                id='85272dcb-2b57-4706-91c9-4286a2d4d446',
                tool_call_id='call_77a08215fce9428d8bf96a5f'
            )
        ]
    },
    'interrupts': []
}
 ----------
```

```
{
    'id': 'f13f0bcf-d104-1d5a-4470-bf2faf4c220d',
    'name': 'model',
    'input': {
        'messages': [
            HumanMessage(
                content='查询客户ID为 CUST123456 的个人信息、历史订单和可
用优惠',
                additional_kwargs={},
                response_metadata={},
                id='cc503bf0-acae-41ef-bf20-cc152b9296fd'
            ),
            AIMessage(
                content='我来帮您查询客户 CUST123456
的个人信息、历史订单和可用优惠。这三个查询是独立的，我将同时进行查询',
                additional_kwargs={'refusal': None},
                response_metadata={
                    'token_usage': {
                        'completion_tokens': 130,
                        'prompt_tokens': 467,
                        'total_tokens': 597,
                        'completion_tokens_details': None,
                        'prompt_tokens_details': {'audio_tokens':
None, 'cached_tokens': 0}
                    },
                    'model_provider': 'openai',
                    'model_name': 'deepseek-v4-flash-0731',
                    'system_fingerprint': None,
                    'id': 'chatcmpl-050cdd80-6a88-90d7-a003-
e9bbef0dd06c',
                    'finish_reason': 'tool_calls',
                    'logprobs': None
                },
                id='lc_run--019ff659-3d22-75c3-a031-b10e0265a688-0',
                tool_calls=[
                    {
                        'name': 'query_customer_data',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_4ba175f4d1be470099640739',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'check_order_history',
                        'args': {'customer_id': 'CUST123456'},
                        'id': 'call_0fc49e45b1fd4432b268d94a',
                        'type': 'tool_call'
                    },
                    {
                        'name': 'get_current_promotions',
                        'args': {},
                        'id': 'call_77a08215fce9428d8bf96a5f',
                        'type': 'tool_call'
                    }
                ],
                invalid_tool_calls=[],
                usage_metadata={
                    'input_tokens': 467,
                    'output_tokens': 130,
                    'total_tokens': 597,
                    'input_token_details': {'cache_read': 0},
                    'output_token_details': {}
                }
            ),
```

```
            ToolMessage(
                content='{"name": "张三", "level": "VIP",
"join_date": "2023-01-15"}',
                name='query_customer_data',
                id='ff09b75f-4cda-4657-b417-0385d6d7de24',
                tool_call_id='call_4ba175f4d1be470099640739'
            ),
            ToolMessage(
                content='{"total_orders": 15, "total_spent":
25800.0}',
                name='check_order_history',
                id='7c434a02-ec08-41f5-8236-73db63b809bb',
                tool_call_id='call_0fc49e45b1fd4432b268d94a'
            ),
            ToolMessage(
                content='{"promotions": ["老用户优惠", "会员专属折扣"],
"valid_until": "2027-01-31"}',
                name='get_current_promotions',
                id='85272dcb-2b57-4706-91c9-4286a2d4d446',
                tool_call_id='call_77a08215fce9428d8bf96a5f'
            )
        ]
    },
    'triggers': ('branch:to:model',)
}

 ----------------------------------------------
```

```
{
    'id': 'f13f0bcf-d104-1d5a-4470-bf2faf4c220d',
    'name': 'model',
    'error': None,
    'result': {
        'messages': [
            AIMessage(
                content='我已经成功查询到了客户 CUST123456 的相关信息，以下是汇总结果：\n\n## 📋 客户个人信息\n| 项目 | 详情 |\n|------|------|\n| **姓名** | 张三 |\n| **会员等级** | VIP |\n| **加入日期** | 2023-01-15 |\n\n## 🛒 订单历史\n| 项目 | 详情 |\n|------|------|\n| **总订单数** | 15 单 |\n| **总消费金额** | ¥25,800.00 |\n\n## 🎁 可用优惠\n| 项目 | 详情 |\n|------|------|\n| **可用促销活动** | ① 老用户优惠 ② 会员专属折扣 |\n| **有效期至** | 2027-01-31 |\n\n---\n\n**总结：** 客户张三是我司的 VIP 会员，自 2023 年加入以来共下单 15 次，累计消费 ¥25,800。目前可享受"老用户优惠"和"会员专属折扣"两项促销活动，有效期至 2027 年 1 月底。\n\n如需进一步分析或查询其他信息，请随时告知！',
                additional_kwargs={'refusal': None},
                response_metadata={
                    'token_usage': {
                        'completion_tokens': 245,
                        'prompt_tokens': 693,
                        'total_tokens': 938,
                        'completion_tokens_details': None,
                        'prompt_tokens_details': {'audio_tokens': None, 'cached_tokens': 0}
                    },
                    'model_provider': 'openai',
                    'model_name': 'deepseek-v4-flash-0731',
                    'system_fingerprint': None,
                    'id': 'chatcmpl-0eef277b-0c17-98c6-9f01-da2653d48727',
                    'finish_reason': 'stop',
                    'logprobs': None
                },
                id='lc_run--019ff659-45fa-7d43-b705-a41151332dd5-0',
                tool_calls=[],
                invalid_tool_calls=[],
                usage_metadata={
                    'input_tokens': 693,
                    'output_tokens': 245,
                    'total_tokens': 938,
                    'input_token_details': {'cache_read': 0},
                    'output_token_details': {}
                }
            )
        ]
    },
    'interrupts': []
}
```

5）debug输出模式

该模式与tasks模式类似，比task模式多输出任务步骤、时间戳、task类型（task/task_result），该模式用于调试、监控task任务的生命周期。

代码如下：

In [21]:
```
from langchain.agents import create_agent
from langchain.tools import tool
from typing import Dict, Any
from rich import print as rprint
@tool
def query_customer_data(customer_id: str) -> Dict[str, Any]:
    """
    查询客户基本信息

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户基本信息的字典，如姓名、等级、加入日期等
    """
    # 模拟数据库查询
    return {"name": "张三","level": "VIP","join_date": "2023-01-15"}

@tool
def check_order_history(customer_id: str) -> Dict[str, Any]:
    """
    查询客户订单历史

    Args:
        customer_id: 客户ID，用于唯一标识客户

    Returns:
        包含客户订单历史的字典，如总订单数、总花费等
    """
    return {"total_orders": 15,"total_spent": 25800.00}

@tool
def get_current_promotions() -> Dict[str, Any]:
    """
    获取当前可用促销活动

    Returns:
        包含当前可用促销活动的字典，如活动名称、有效日期等
    """
    return {
        "promotions": ["老用户优惠", "会员专属折扣"],
        "valid_until": "2027-01-31"
    }

# 创建客户服务Agent
customer_service_agent = create_agent(
    model=model,
    tools=[query_customer_data, check_order_history, get_current_promotions]
)

for chunk in customer_service_agent.stream(
    {"messages": [{"role": "user","content": "查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠"}]},
    stream_mode="debug"
):
    rprint(chunk)
    print("-" * 50)
```

```
{
    'step': 1,
    'timestamp': '2026-08-12T14:22:50.948154+00:00',
    'type': 'task',
    'payload': {
        'id': 'dff063c6-e6a2-a302-26d6-5586b5ce697f',
        'name': 'model',
        'input': {
            'messages': [
                HumanMessage(
                    content='查询客户ID为 CUST123456 的个人信息、历史订单
和可用优惠',
                    additional_kwargs={},
                    response_metadata={},
                    id='4de03288-105d-4755-a9a9-45a306f47959'
                )
            ]
        },
        'triggers': ('branch:to:model',)
    }
}
 ----------------------------------------------
```

```
{
    'step': 1,
    'timestamp': '2026-08-12T14:22:52.884443+00:00',
    'type': 'task_result',
    'payload': {
        'id': 'dff063c6-e6a2-a302-26d6-5586b5ce697f',
        'name': 'model',
        'error': None,
        'result': {
            'messages': [
                AIMessage(
                    content='我来为您查询客户 CUST123456 的个人信息、历史
订单和可用优惠信息',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 120,
                            'prompt_tokens': 467,
                            'total_tokens': 587,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-f533b6e8-f1e3-9c36-ae1b-
ec825d046a24',
                        'finish_reason': 'tool_calls',
                        'logprobs': None
                    },
                    id='lc_run--019ff65a-c254-78e2-8a78-
ce7f2a8c1d8b-0',
                    tool_calls=[
                        {
                            'name': 'query_customer_data',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_6c38ec4791f14761b0a29123',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'check_order_history',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_3fa0afdf50a94dcb9a1bce71',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'get_current_promotions',
                            'args': {},
                            'id': 'call_d1f587d2598b4ee0ab68e91c',
                            'type': 'tool_call'
                        }
                    ],
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 467,
                        'output_tokens': 120,
                        'total_tokens': 587,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                )
            ]
        },
```

```
        'interrupts': []
    }
}
```

```
{
    'step': 2,
    'timestamp': '2026-08-12T14:22:52.884443+00:00',
    'type': 'task',
    'payload': {
        'id': 'c51b9484-725d-3388-7ed9-6e53766a93db',
        'name': 'tools',
        'input': {
            '__type': 'tool_call_with_context',
            'tool_call': {
                'name': 'query_customer_data',
                'args': {'customer_id': 'CUST123456'},
                'id': 'call_6c38ec4791f14761b0a29123',
                'type': 'tool_call'
            },
            'state': {
                'messages': [
                    HumanMessage(
                        content='查询客户ID为 CUST123456 的个人信息、历
史订单和可用优惠',
                        additional_kwargs={},
                        response_metadata={},
                        id='4de03288-105d-4755-a9a9-45a306f47959'
                    ),
                    AIMessage(
                        content='我来为您查询客户 CUST123456 的个人信
息、历史订单和可用优惠信息',
                        additional_kwargs={'refusal': None},
                        response_metadata={
                            'token_usage': {
                                'completion_tokens': 120,
                                'prompt_tokens': 467,
                                'total_tokens': 587,
                                'completion_tokens_details': None,
                                'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                            },
                            'model_provider': 'openai',
                            'model_name': 'deepseek-v4-flash-0731',
                            'system_fingerprint': None,
                            'id': 'chatcmpl-f533b6e8-f1e3-9c36-ae1b-
ec825d046a24',
                            'finish_reason': 'tool_calls',
                            'logprobs': None
                        },
                        id='lc_run--019ff65a-c254-78e2-8a78-
ce7f2a8c1d8b-0',
                        tool_calls=[
                            {
                                'name': 'query_customer_data',
                                'args': {'customer_id':
'CUST123456'},
                                'id':
'call_6c38ec4791f14761b0a29123',
                                'type': 'tool_call'
                            },
                            {
                                'name': 'check_order_history',
                                'args': {'customer_id':
'CUST123456'},
                                'id':
'call_3fa0afdf50a94dcb9a1bce71',
                                'type': 'tool_call'
```

```
                                },
                                {
                                    'name': 'get_current_promotions',
                                    'args': {},
                                    'id':
'call_d1f587d2598b4ee0ab68e91c',
                                    'type': 'tool_call'
                                }
                            ],
                            invalid_tool_calls=[],
                            usage_metadata={
                                'input_tokens': 467,
                                'output_tokens': 120,
                                'total_tokens': 587,
                                'input_token_details': {'cache_read':
0},
                                'output_token_details': {}
                            }
                        )
                    ]
                }
            },
            'triggers': ('__pregel_push',)
        }
}
 ----------------------------------------------
```

```
{
    'step': 2,
    'timestamp': '2026-08-12T14:22:52.884443+00:00',
    'type': 'task',
    'payload': {
        'id': 'ba81389f-06a5-1096-cb13-e178c1bcf8eb',
        'name': 'tools',
        'input': {
            '__type': 'tool_call_with_context',
            'tool_call': {
                'name': 'check_order_history',
                'args': {'customer_id': 'CUST123456'},
                'id': 'call_3fa0afdf50a94dcb9a1bce71',
                'type': 'tool_call'
            },
            'state': {
                'messages': [
                    HumanMessage(
                        content='查询客户ID为 CUST123456 的个人信息、历
史订单和可用优惠',
                        additional_kwargs={},
                        response_metadata={},
                        id='4de03288-105d-4755-a9a9-45a306f47959'
                    ),
                    AIMessage(
                        content='我来为您查询客户 CUST123456 的个人信
息、历史订单和可用优惠信息',
                        additional_kwargs={'refusal': None},
                        response_metadata={
                            'token_usage': {
                                'completion_tokens': 120,
                                'prompt_tokens': 467,
                                'total_tokens': 587,
                                'completion_tokens_details': None,
                                'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                            },
                            'model_provider': 'openai',
                            'model_name': 'deepseek-v4-flash-0731',
                            'system_fingerprint': None,
                            'id': 'chatcmpl-f533b6e8-f1e3-9c36-ae1b-
ec825d046a24',
                            'finish_reason': 'tool_calls',
                            'logprobs': None
                        },
                        id='lc_run--019ff65a-c254-78e2-8a78-
ce7f2a8c1d8b-0',
                        tool_calls=[
                            {
                                'name': 'query_customer_data',
                                'args': {'customer_id':
'CUST123456'},
                                'id':
'call_6c38ec4791f14761b0a29123',
                                'type': 'tool_call'
                            },
                            {
                                'name': 'check_order_history',
                                'args': {'customer_id':
'CUST123456'},
                                'id':
'call_3fa0afdf50a94dcb9a1bce71',
                                'type': 'tool_call'
```

```
                            },
                            {
                                'name': 'get_current_promotions',
                                'args': {},
                                'id':
'call_d1f587d2598b4ee0ab68e91c',
                                'type': 'tool_call'
                            }
                        ],
                        invalid_tool_calls=[],
                        usage_metadata={
                            'input_tokens': 467,
                            'output_tokens': 120,
                            'total_tokens': 587,
                            'input_token_details': {'cache_read':
0},
                            'output_token_details': {}
                        }
                    )
                ]
            }
        },
        'triggers': ('__pregel_push',)
    }
}
```

{
    'step': 2,
    'timestamp': '2026-08-12T14:22:52.884443+00:00',
    'type': 'task',
    'payload': {
        'id': '45192082-a250-2db2-86a7-230ba2b95df1',
        'name': 'tools',
        'input': {
            '__type': 'tool_call_with_context',
            'tool_call': {
                'name': 'get_current_promotions',
                'args': {},
                'id': 'call_d1f587d2598b4ee0ab68e91c',
                'type': 'tool_call'
            },
            'state': {
                'messages': [
                    HumanMessage(
                        content='查询客户ID为 CUST123456 的个人信息、历史订单和可用优惠',
                        additional_kwargs={},
                        response_metadata={},
                        id='4de03288-105d-4755-a9a9-45a306f47959'
                    ),
                    AIMessage(
                        content='我来为您查询客户 CUST123456 的个人信息、历史订单和可用优惠信息',
                        additional_kwargs={'refusal': None},
                        response_metadata={
                            'token_usage': {
                                'completion_tokens': 120,
                                'prompt_tokens': 467,
                                'total_tokens': 587,
                                'completion_tokens_details': None,
                                'prompt_tokens_details': {'audio_tokens': None, 'cached_tokens': 0}
                            },
                            'model_provider': 'openai',
                            'model_name': 'deepseek-v4-flash-0731',
                            'system_fingerprint': None,
                            'id': 'chatcmpl-f533b6e8-f1e3-9c36-ae1b-ec825d046a24',
                            'finish_reason': 'tool_calls',
                            'logprobs': None
                        },
                        id='lc_run--019ff65a-c254-78e2-8a78-ce7f2a8c1d8b-0',
                        tool_calls=[
                            {
                                'name': 'query_customer_data',
                                'args': {'customer_id': 'CUST123456'},
                                'id': 'call_6c38ec4791f14761b0a29123',
                                'type': 'tool_call'
                            },
                            {
                                'name': 'check_order_history',
                                'args': {'customer_id': 'CUST123456'},
                                'id': 'call_3fa0afdf50a94dcb9a1bce71',
                                'type': 'tool_call'

```
                                },
                                {
                                    'name': 'get_current_promotions',
                                    'args': {},
                                    'id':
'call_d1f587d2598b4ee0ab68e91c',
                                    'type': 'tool_call'
                                }
                            ],
                            invalid_tool_calls=[],
                            usage_metadata={
                                'input_tokens': 467,
                                'output_tokens': 120,
                                'total_tokens': 587,
                                'input_token_details': {'cache_read':
0},
                                'output_token_details': {}
                            }
                        )
                    ]
                }
            },
            'triggers': ('__pregel_push',)
        }
}

 --------------------------------------------
{
    'step': 2,
    'timestamp': '2026-08-12T14:22:52.981045+00:00',
    'type': 'task_result',
    'payload': {
        'id': 'c51b9484-725d-3388-7ed9-6e53766a93db',
        'name': 'tools',
        'error': None,
        'result': {
            'messages': [
                ToolMessage(
                    content='{"name": "张三", "level": "VIP",
"join_date": "2023-01-15"}',
                    name='query_customer_data',
                    id='0dfe608c-0715-48b4-a42c-8a75483d2cd2',
                    tool_call_id='call_6c38ec4791f14761b0a29123'
                )
            ]
        },
        'interrupts': []
    }
}

 --------------------------------------------
```

```
{
    'step': 2,
    'timestamp': '2026-08-12T14:22:52.991052+00:00',
    'type': 'task_result',
    'payload': {
        'id': 'ba81389f-06a5-1096-cb13-e178c1bcf8eb',
        'name': 'tools',
        'error': None,
        'result': {
            'messages': [
                ToolMessage(
                    content='{"total_orders": 15, "total_spent":
25800.0}',
                    name='check_order_history',
                    id='ec6404f1-83ad-4bbf-8fd3-df26ff8ad28f',
                    tool_call_id='call_3fa0afdf50a94dcb9a1bce71'
                )
            ]
        },
        'interrupts': []
    }
}
 ----------------------------------------------
{
    'step': 2,
    'timestamp': '2026-08-12T14:22:53.003041+00:00',
    'type': 'task_result',
    'payload': {
        'id': '45192082-a250-2db2-86a7-230ba2b95df1',
        'name': 'tools',
        'error': None,
        'result': {
            'messages': [
                ToolMessage(
                    content='{"promotions": ["老用户优惠", "会员专属折
扣"], "valid_until": "2027-01-31"}',
                    name='get_current_promotions',
                    id='5abae585-6958-4155-8d82-b5cb770525bf',
                    tool_call_id='call_d1f587d2598b4ee0ab68e91c'
                )
            ]
        },
        'interrupts': []
    }
}
 ----------------------------------------------
```

```
{
    'step': 3,
    'timestamp': '2026-08-12T14:22:53.012040+00:00',
    'type': 'task',
    'payload': {
        'id': 'e099e702-0a69-6dc6-6e75-db2cbb810733',
        'name': 'model',
        'input': {
            'messages': [
                HumanMessage(
                    content='查询客户ID为 CUST123456 的个人信息、历史订单
和可用优惠',
                    additional_kwargs={},
                    response_metadata={},
                    id='4de03288-105d-4755-a9a9-45a306f47959'
                ),
                AIMessage(
                    content='我来为您查询客户 CUST123456 的个人信息、历史
订单和可用优惠信息',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 120,
                            'prompt_tokens': 467,
                            'total_tokens': 587,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-f533b6e8-f1e3-9c36-ae1b-
ec825d046a24',
                        'finish_reason': 'tool_calls',
                        'logprobs': None
                    },
                    id='lc_run--019ff65a-c254-78e2-8a78-
ce7f2a8c1d8b-0',
                    tool_calls=[
                        {
                            'name': 'query_customer_data',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_6c38ec4791f14761b0a29123',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'check_order_history',
                            'args': {'customer_id': 'CUST123456'},
                            'id': 'call_3fa0afdf50a94dcb9a1bce71',
                            'type': 'tool_call'
                        },
                        {
                            'name': 'get_current_promotions',
                            'args': {},
                            'id': 'call_d1f587d2598b4ee0ab68e91c',
                            'type': 'tool_call'
                        }
                    ],
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 467,
                        'output_tokens': 120,
```

```
                        'total_tokens': 587,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                ),
                ToolMessage(
                    content='{"name": "张三", "level": "VIP",
"join_date": "2023-01-15"}',
                    name='query_customer_data',
                    id='0dfe608c-0715-48b4-a42c-8a75483d2cd2',
                    tool_call_id='call_6c38ec4791f14761b0a29123'
                ),
                ToolMessage(
                    content='{"total_orders": 15, "total_spent":
25800.0}',
                    name='check_order_history',
                    id='ec6404f1-83ad-4bbf-8fd3-df26ff8ad28f',
                    tool_call_id='call_3fa0afdf50a94dcb9a1bce71'
                ),
                ToolMessage(
                    content='{"promotions": ["老用户优惠", "会员专属折
扣"], "valid_until": "2027-01-31"}',
                    name='get_current_promotions',
                    id='5abae585-6958-4155-8d82-b5cb770525bf',
                    tool_call_id='call_d1f587d2598b4ee0ab68e91c'
                )
            ]
        },
        'triggers': ('branch:to:model',)
    }
}
 ----------------------------------------------
```

```
{
    'step': 3,
    'timestamp': '2026-08-12T14:22:56.260428+00:00',
    'type': 'task_result',
    'payload': {
        'id': 'e099e702-0a69-6dc6-6e75-db2cbb810733',
        'name': 'model',
        'error': None,
        'result': {
            'messages': [
                AIMessage(
                    content='我已经成功查询到客户 CUST123456 的相关信息，
以下是详细结果：\n\n---\n\n## 📋
客户个人信息\n| 项目 | 内容 |\n|------|------|\n| **客户ID** |
CUST123456 |\n| **姓名** | 张三 |\n| **会员等级** |
VIP |\n| **加入日期** | 2023-01-15 |\n\n---\n\n## 🛒 历史订单信息\n| 项
目 | 内容 |\n|------|------|\n| **总订单数**
| 15 笔 |\n| **累计消费金额** | ¥25,800.00 |\n\n---\n\n## 🎁 当前可用优
惠\n| 项目 | 内容 |\n|------|------|\n|
**可用促销活动** | ① 老用户优惠<br>② 会员专属折扣 |\n| **优惠有效期至** |
2027-01-31 |\n\n---\n\n### 📌 小结\n客户
**张三** 是 **VIP 等级** 会员，自 2023 年加入以来共完成 **15 笔订单**，累计
消费 **¥25,800**。目前可享受
**老用户优惠** 和 **会员专属折扣** 两项促销活动，有效期至 2027 年 1 月 31
日。\n\n如需进一步了解订单详情或优惠具体内容，请随时告诉我！',
                    additional_kwargs={'refusal': None},
                    response_metadata={
                        'token_usage': {
                            'completion_tokens': 281,
                            'prompt_tokens': 683,
                            'total_tokens': 964,
                            'completion_tokens_details': None,
                            'prompt_tokens_details':
{'audio_tokens': None, 'cached_tokens': 0}
                        },
                        'model_provider': 'openai',
                        'model_name': 'deepseek-v4-flash-0731',
                        'system_fingerprint': None,
                        'id': 'chatcmpl-8c805add-40c3-94e8-9f27-
5c1d82374aee',
                        'finish_reason': 'stop',
                        'logprobs': None
                    },
                    id='lc_run--019ff65a-ca6a-77e1-8e01-
218848286855-0',
                    tool_calls=[],
                    invalid_tool_calls=[],
                    usage_metadata={
                        'input_tokens': 683,
                        'output_tokens': 281,
                        'total_tokens': 964,
                        'input_token_details': {'cache_read': 0},
                        'output_token_details': {}
                    }
                )
            ]
        },
        'interrupts': []
    }
}
```