React Training & prompt tips

Thursday, 17 April 2025 9:20 PM

Training Example

For the 2 × 12 × 2 calculation, a training example might look like this:
Input (prompt):

```
Calculate 2 × 12 × 2
```

Output (desired response):

```
Thought: I need to calculate the product of three numbers: 2, 12, and 2. I'll
break this down into steps.
Action: First, I'll multiply 2 × 12.
Observation: 2 × 12 = 24
Thought: Now I need to multiply the result by the remaining factor of 2.
Action: Calculate 24 × 2.
Observation: 24 × 2 = 48
Thought: I've completed all multiplication steps in the expression.
Action: Review my calculation to ensure accuracy.
Observation: The calculation is correct. The answer to 2 × 12 × 2 is 48.
```

Creating a Training Dataset

To build a comprehensive ReAct training dataset, you would:

1. Create hundreds or thousands of problem-solution pairs
2. Ensure each solution follows the Thought-Action-Observation pattern
3. Cover diverse problem types (math, reasoning, planning, etc.)
4. Include examples of different complexity levels

`React prompting:` Please solve 2 × 12 × 2 using the ReAct method. Break down your thinking into Thought, Action, and Observation steps.

Prompt tips:

- Context
- Example
- Instruction
- Output format
- Non ambiguous task
- Iterations

Example:

```
from langchain import LLM
from langchain.agents import Tool, ReActAgent

# Define available tools
search_tool = Tool(
   name="Search",
   description="Search for information on the internet",
   func=lambda query: search_engine_api(query)
)

calculator_tool = Tool(
   name="Calculator",
   description="Perform mathematical calculations",
   func=lambda expression: eval(expression)
)
```

```
,

weather_tool = Tool(
    name="Weather",
    description="Get current weather for a location",
    func=lambda location: weather_api(location)
)

tools = [search_tool, calculator_tool, weather_tool]

# Initialize ReAct agent
llm = LLM(model="gpt-4")
agent = ReActAgent(llm=llm, tools=tools)

# User question requiring multiple steps
question = "What will be the temperature difference between New York and Los Angeles tomorrow, and is it greater than 15 degrees?"

# The ReAct process
result = agent.run(question)
"""
Thought: I need to find the weather forecasts for both New York and Los Angeles tomorrow, then calculate the difference.
Action: Weather(New York)
Observation: New York forecast for tomorrow: High 75°F, Low 62°F

Thought: Now I need Los Angeles weather.
Action: Weather(Los Angeles)
Observation: Los Angeles forecast for tomorrow: High 82°F, Low 64°F

Thought: I need to calculate the temperature difference between the high temperatures.
Action: Calculator(82 - 75)
Observation: 7

Thought: The temperature difference is 7 degrees. I need to determine if this is greater than 15 degrees.
Action: Calculator(7 > 15)
Observation: False

Thought: I now have all the information to answer the question.
Answer: The temperature difference between Los Angeles and New York tomorrow will be 7 degrees (82°F vs 75°F), which is not greater than 15 degrees.
"""
```