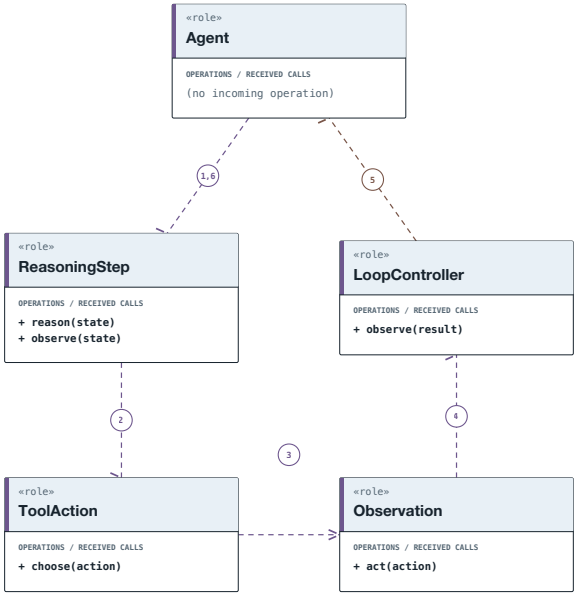
# R01 Reason-act-observe

Reasoning / UML CLASS VIEW / ANALYTICAL MODEL

Interleave reasoning and external actions.

**UML CLASS VIEW**

dashed arrow: call dependency · brown: return/failure · analytical, not an observed trace




**POINTCUT / PATTERN INTERFACE**

| | |
|---|---|
| CONTEXT | An agent can reason and use an external action interface. |
| TRIGGER | The model emits reasoning followed by an action request. |
| STRUCTURE | Parsed action, execution result, and observation fed into the next cycle. |
| EFFECT | External evidence enters the reasoning trajectory before the next action. |

**CONTRACT / REQUIRED BEHAVIOR**

| | |
|---|---|
| REQUIRES | Action and observation schemas are stable enough to parse. |
| ENSURES | Every executed action has an attributable observation or execution error. |
| INVARIANT | Model reasoning is not treated as environment evidence. |
| VIOLATION | Invalid action, unavailable tool, or parse error is exposed to the loop. |

**RELATIONSHIPS / ANALYTICAL CALLS**

number · caller → callee · message

1 Agent → ReasoningStep reason(state)
2 ReasoningStep → ToolAction choose(action)
3 ToolAction → Observation act(action)
4 Observation → LoopController observe(result)
5 LoopController ↩ Agent continue(observation)
6 Agent → ReasoningStep observe(state)

**VARIATION / TEST / NEGATIVE CONTROL**

| | |
|---|---|
| VARIATION | Prompt protocol, typed tool call, XML or text parser, and observation compression. |
| TEST_OBLIGATION | Test action-observation linkage, malformed action, tool error, and loop termination. |
| NEGATIVE_CONTROL | Chain-of-thought text without external action is not ReAct. |