Example

User:

Find the sum of the reciprocals of the roots of $x^2-13x+4=0$.

Assistant:

To find the sum of the reciprocals of the roots of the quadratic equation $x^2-13x+4=0$ [...] <execute>

```
import sympy
x = sympy.Symbol('x')
roots = sympy.solve(x**2 - 13*x + 4)
```

print(1/roots[0] + 1/roots[1])
</execute>

Env:

1/(3*sqrt(17)/2 + 13/2) + 1/(13/2 - 3*sqrt(17)/2)

Assistant:

The roots obtained are in symbolic form, which makes it difficult to evaluate the sum directly.

Let's use the quadratic formula to explicitly find the numerical values of the roots first.

[...]



CodeAct unified action space



Environment Software Interface (API)

<u>Interface for Computer</u>

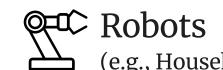


-+ Software Package (Tool)

(e.g., Calculate, Download, Visualize)

External Memory (e.g., Database, Graph)

Interface for Physical World

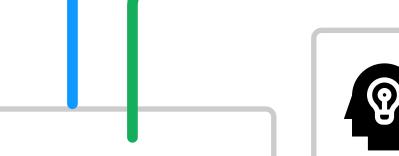


(e.g., Household Robots, Automated Lab)

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Outcome

E.g., Execution results, Automated error feedback



(3) Action

(1) Observation

Planning

- Chain-of-thought
- Self-Reflection
- Improving Action from Prior Observation

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(2) Think



Conversation

in Natural Language

Initiate Interaction

Conversation

E.g., Natural Language Instruction or Feedback