

STRIPS exercise

Given the initial state:

**[ontable(a,p1), ontable(d,p3), on(c,d), clear(a), clear(c), empty(p2),
handempty]**

(p1,p2,p3 are three positions on the table)

Actions are modelled as:

- **pickup(X,Pos)**
PRECOND: ontable(X,Pos), clear(X), handempty
DELETE: ontable(X,Pos), clear(X), handempty
ADD: holding(X), empty(Pos)
- **putdown(X,Pos)**
PRECOND: holding(X), empty(Pos)
DELETE: holding(X), empty(Pos)
ADD: ontable(X,Pos), clear(X), handempty

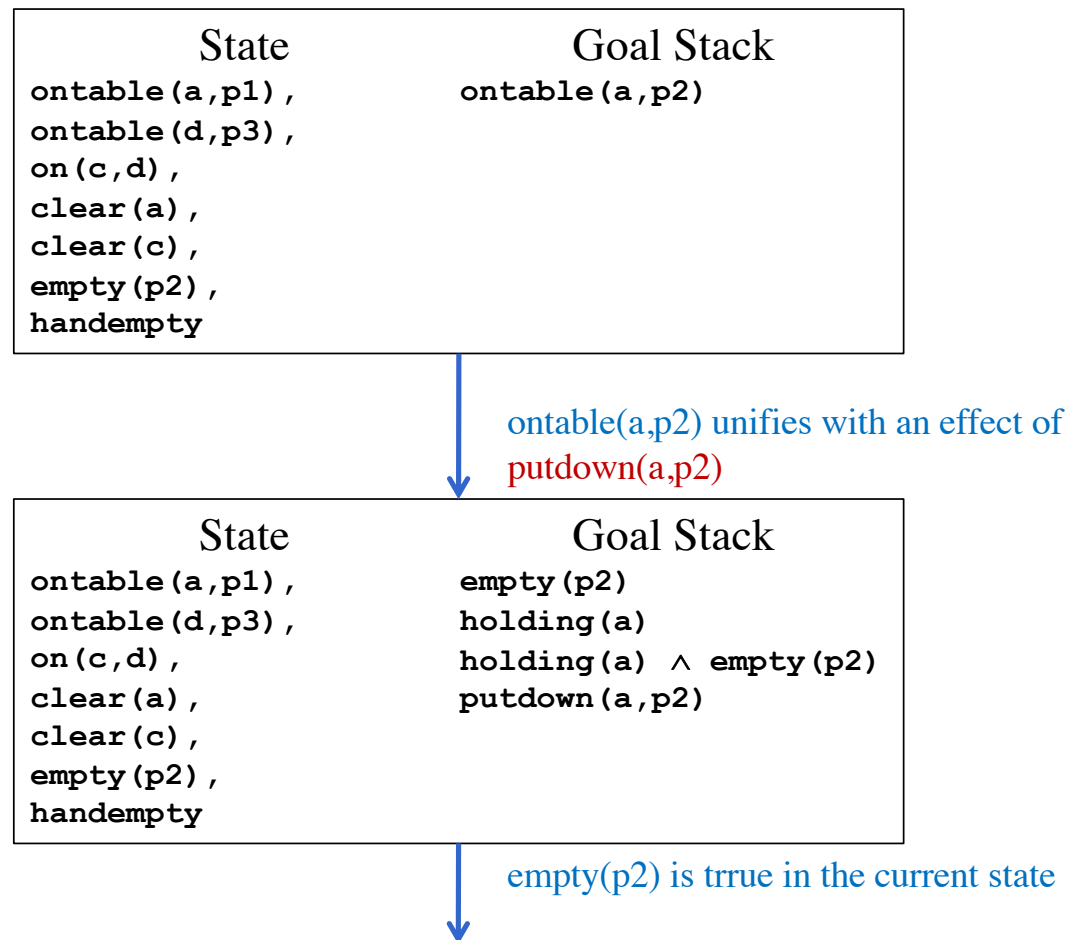
STRIPS exercise

- **stack(X,Y)**
PRECOND: holding(X), clear(Y)
DELETE: holding(X), clear(Y)
ADD: handempty, on(X,Y), clear(X)
- **unstack(X,Y)**
PRECOND: handempty, on(X,Y), clear(X)
DELETE: handempty, on(X,Y), clear(X)
ADD: holding(X), clear(Y)

The goal is **ontable(a,p2)**

Describe how the algorithm STRIPS finds a plan. Show ONLY ONE PATH from the root to the node.

STRIPS exercise



STRIPS exercise

empty(p2) is true in the current state

State	Goal Stack
<code>ontable(a,p1),</code> <code>ontable(d,p3),</code> <code>on(c,d),</code> <code>clear(a),</code> <code>clear(c),</code> <code>empty(p2),</code> <code>handempty</code>	<code>holding(a)</code> <code>holding(a) \wedge empty(p2)</code> <code>putdown(a,p2)</code>

holding(a) unifies with an effect of
pickup(a,Pos)

State	Goal Stack
<code>ontable(a,p1),</code> <code>ontable(d,p3),</code> <code>on(c,d),</code> <code>clear(a),</code> <code>clear(c),</code> <code>empty(p2),</code> <code>Handempty</code>	<code>ontable(a,Pos)</code> <code>clear(a)</code> <code>handempty</code> <code>ontable(a,Pos) \wedge clear(a) \wedge han</code> <code>dempty</code> <code>pickup(a,Pos)</code> <code>holding(a) \wedge empty(p2)</code> <code>putdown(a,p2)</code>

ontable(a,Pos) is true in the current state
with the unification Pos/p1

STRIPS exercise

ontable(a,Pos) is true in the current state
with the unification Pos/p1

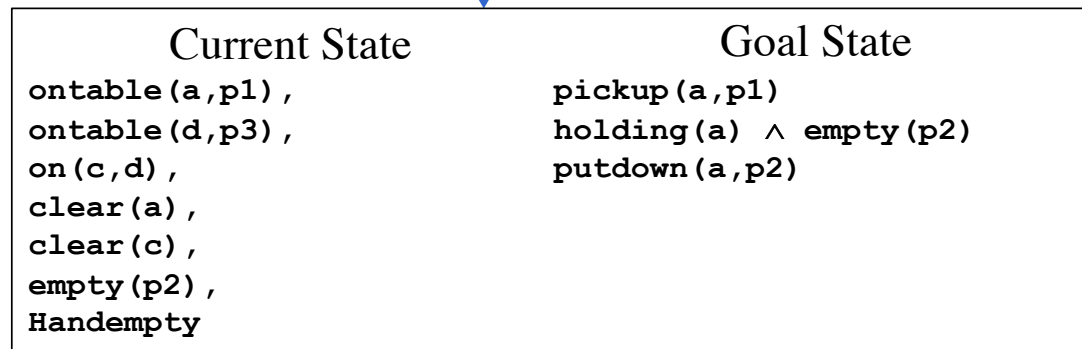
Current State	Goal Stack
ontable(a,p1), ontable(d,p3), on(c,d), clear(a), clear(c), empty(p2), Handempty	clear(a) handempty ontable(a,p1) ∧ clear(a) ∧ hand empty pickup(a,p1) holding(a) ∧ empty(p2) putdown(a,p2)

clear(a) and handempty are true in the
current state

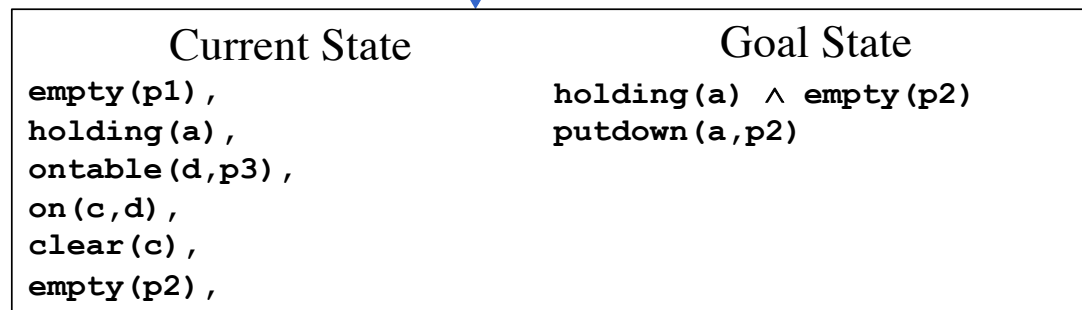
Current State	Goal Stack
ontable(a,p1), ontable(d,p3), on(c,d), clear(a), clear(c), empty(p2), Handempty	ontable(a,p1) ∧ clear(a) ∧ hand empty pickup(a,p1) holding(a) ∧ empty(p2) putdown(a,p2)

The conjunction is true in the current state

STRIPS exercise



Execution of action `pickup(a,p1)`



The conjunction is true in the current state

STRIPS exercise

The conjunction is true in the current state

Current State	Goal Stack
<code>empty(p1) ,</code> <code>holding(a) ,</code> <code>ontable(d,p3) ,</code> <code>on(c,d) ,</code> <code>clear(c) ,</code> <code>empty(p2) ,</code>	<code>putdown(a,p2)</code>

Execution of action `putdown(a,p2)`

Current State	Goal Stack
<code>empty(p1) ,</code> <code>handempty(a) ,</code> <code>ontable(d,p3) ,</code> <code>on(c,d) ,</code> <code>clear(c) ,</code> <code>ontable(a,p2)</code> <code>clear(a)</code>	