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GOAL Stack Planning

→ In goal stack planning, a stack of goals is maintained.

→ Accordingly, the corresponding actions are carried out to get the solution.

1) Push the original goal into Stack

→ If the top is compound goal push to the stack.
[Compond goal – Similarity with goal in initial state need to check]

→ If the top is a single unsatisfied goal replace by the an action, Push action pre-conditions.

→ If top is action then pop

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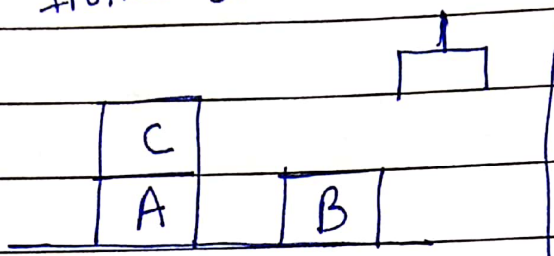
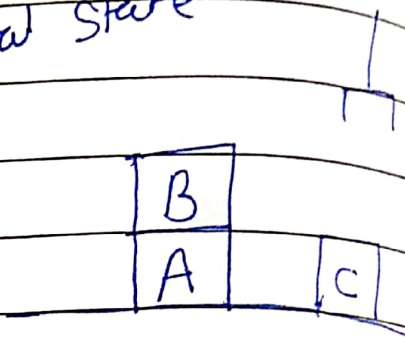
Apply goal Stack planning for following condition.

Initial State	Goal State
	

→ In goal Stack planning, a Stack of goals is maintained.
→ Accordingly, the corresponding actions are carried out to get the Soln.

Step ①

The initial State here is

On(A, table) ∧ On(B, table) ∧ On(C, A) ∧
Clear(C) ∧ Clear(B) ∧ Empty-hand

The goal State is

On(A, table) ∧ On(B, A) ∧ On(C, table) ∧
Clear(C) ∧ Clear(B) ∧ Empty-hand

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→ If we ignore empty hand and clear statement for similicity - modified geal will be

Goal:

on(A, table) ^ on(C, table) ^ on(B, A)

step → The stack of goals will be

(2) Stock 1.

on(A, table)

on(C, table)

on(B, A)

on(B, A) ^ on(C, table) ^ on(A, table)

→ Here last operation gives you the final geal.

→ As A is already placed on table. So for on(C, table) we need.

Place(C) and Unstack(C, A)

step

(3) Now, we replace the on(C, table) and add this to it. (the Stack in Step 2)

Unstack (C, A)
Place (C)
on (B, A)
on(B, A) ^ on(C, table) ^ on (A, table)

Step (4) → we have added unstack (C, A) we need to add pre-conditions for this.
This is done in following way.
[Modified Stack will be ...]

on (A, table)
clear (C)
on (C, A)
Empty-hand
Empty-hand ^ on(C, A) ^ clear(C) ^ on (A, table)
Unstack (C, A)
Place (C)
on (B, A)
on(B, A) ^ on(C, table) ^ on (A, table)

Step 5

→ From the Stack in Step 4, we can observe that, on(A, table) is valid. So we can remove this from Stack.
- Similarly, clear(c) and on(c,A) are also valid so we can remove these also. Empty-hand condition also valid. Remove it.
- Since all pre-conditions are valid they are removed.
- Finally the Stack has:

Unstack (c, A)
Place (c)
on (B, A)
on(BA) ^ on(c, table) ^ on(A, table)

Step 6

→ Since all Pre-conditions are satisfied for unstack operation to occur, we record this action to be the first step that is required to be carried out in the planning sequence.

→ For place (c) the pre conditions are

- the hand should be holding C only then only it can be placed.

→ As this pre-condition are valid, the action is also finalised.

→ Thus the sequence is continued onces finalized, goal is achived.

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Note

→ There could be cases, where multiple options can exist.
→ So, there could be two or more goal stacks, where the operations has to be carried out.
→ Once the first goal is achived, the next goal is looked upon.
→ Similarly, the actions and the conditions are added.