Assignment AIR

Title :-

Implement goal stack planning.

Problem Statement :-

Implement goal stack planning for the following configuration from the blocks of world

Objective :

To learn and implement goal stack planning

Outcome :

Students will able to implement ~~get~~ goal stack planning.

Software and Hardware requirements :-

Operating System : 64 bit windows or open Source OS.
python interpreter.

Theory :-

Goal Stack Planning (GSP) is the one of the simplest planning algorithm that is designed to handle problems having command goals the approch user a stack for plan generation The ~~stat~~ stack can contain subgoal and predicate for actions.

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Algorithm :-

1. Push the goal state into the stack
2. Push the individual predicate of goal state into the stack.
3. Loop till stack is empty.
   pop an element E from the stack
   If E is a predicate.
      If E is true then
         Do nothing.
      Else
         push the relevant action into the stack
         push the individual predicates of the action into the stack.
   Else if E is an action.
      Apply the action to current state
      Add the action 'a' to the plan

Operations :-

	Operations	Precondition	Delete	Add
1)	Stack (x, y)	clear (y) ∧ Holding (x)	clear (x) Holding (x)	ARMEMPTY on(x,y)
2)	Unstack (x, y)	ARMEMPTY ∧ ON (x, Y) ∧ clear (x)	ARMEMPTY ∧ ON (x,Y)	HOLDING(x) ∧ CLEAR(Y)
3)	PICKUP (x)	CLEAR (x) ∧ ONTABLE (x) ∧ ARMEMPTY	ONTABLE (x) ∧ ARMEMPTY	HOLDING (x)
4)	PUTDOWN (x)	HOLDING (x)	HOLDING (x)	ONTABLE (x) ∧ ARMEMPTY

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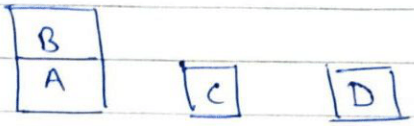
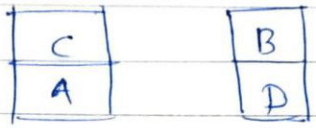
Example :-

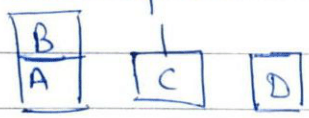
Initial state:



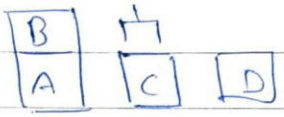
Goal state



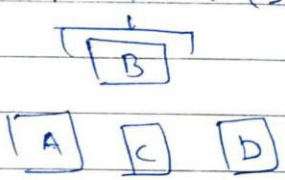
1. Pick up (c)



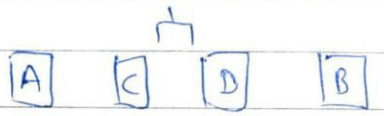
2 PUTDOWN(C)



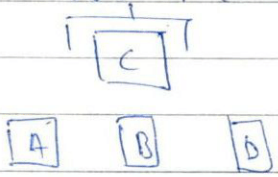
3. UNSTACK(B,A)



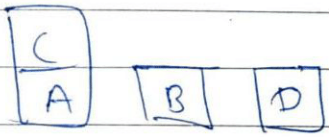
4. PUTDOWN (B)



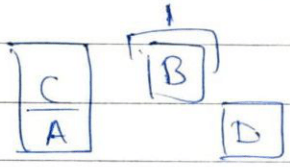
5. PICKUP (C)



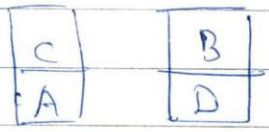
6. STACK (C,A)



7. PICKUP (B)



8. STACK (B,D)



(Goal state)

Conclusion :-

Goal Stack Planning is performed using PICKUP(), PUTDOWN(), UNSTACK() and STACK() problem using python.

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