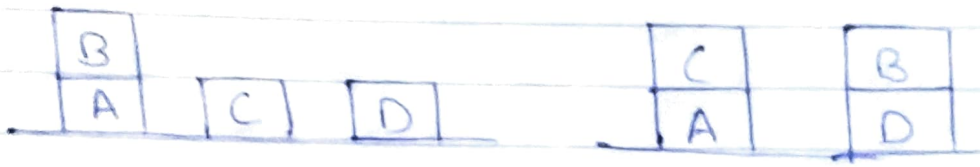
Date:

Assignment No-B3

Title:- Goal Stack Planning.

Problem Statement:-
Implement goal stack planning for the following configuration from the blocks world.



Objectives:-
To learn and implement goal stack planning.

Outcome:-
Be able to learn and successfully implement goal stack planning.

Software Requirements:- Python3, UNIX/LINUX OS

Hardware Requirements:- 64 bit CPU, 8 GB RAM

Theory:-
Block word problem is described as follows: there are N blocks, a table and a robotic arm. Blocks are identified by integers 1.... N.

Each block can sit on top of another block, or on the table; there can be a stack of blocks of arbitrary height.

However only one block can be directly on another block. No two blocks can be sitting directly on the same block.

The bottom-most block of a stack must be on the table. The table can hold any number of blocks.

If there is no block on top of a block, then the block is clear. The robotic arm can only hold one block. If the robotic arm does not hold any block, it is empty.

GOAL STACK PLANNER.

Goal Stack Planning integrates the advantages of both forward and backward planning.

An action is added to the plan only if it preconditions are satisfied, then we add a relevent action for that precondition and push the preconditions on stack and repeat the same process

There might be more than one relevent action for some predicates; but since Goal stack Planning tries to choose only the relevent action starting from the goal state, the time it takes is smaller than the forward and backward planning search strategies. However, it does not always give an optimal solution.

Algorithm:

1). Push the goal statte on stack.
2) Repeat until the stack is empty.
   a) If stack top is a compound goal.
      i) Push its subgoals on stack.
   b) If stack top is a single unsatisfied goal.
      i) replace it by an action that makes it satisfied.
   c) If stack tops is an action.
      i) check for unsatisfied prerequisites.
      ii) if all prerequisites are satisfied.
         I) Pop action from stack.
         II) execute it.
         III) change the knowledge base by the action's effects.
      else.
         I) push unsatisfied preconditions on stack

d). If stack top is a satisfied goal.
) Pop it from stack.

Conclusion:
Successfully implemented goal stack Planning.