EXPERIMENT NO. 7

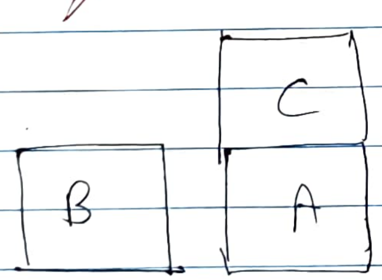
Aim :- To solve blocks world problem using Planning in AI.

Theory :-

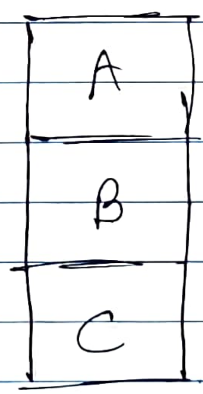
Blocks World Problem :

- The blocks world problem domain consists of a set of cube-shaped blocks sitting on a table. The blocks can be stacked, but only one block can fit directly on top of another. A robot arm can pick up a block only one block at a time. The goal will always be to build one or more stacks of blocks, specified in terms of what blocks are on top of what other blocks.

INITIAL STATE :



GOAL STATE :



Predicates used :

- On (b, x) is used to indicate that block b is on x, where x is either another block on the table.

- Move (b, x, y) is used to indicate movement of block b from the top of x to the top of y.

- Clear (x) It is used to indicate that nothing is on top of x.

Action (Move (b, x, y)),

PRECOND : On (b, x) ∧ Clear (b) ∧ Clear (y)
EFFECT : On (b, y) ∧ Clear (x) ∧ ¬ On (b, x) ∧ ¬ clear (y))

For next step,

Action (MoveToTable (b, x)),

PRECOND : On (b, x) ∧ Clear (x)
EFFECT : On (b, Table) ∧ Clear (x) ∧ ¬ On (b, x))

PLANNING :

Sequence Solution :

[MoveToTable (C, A), Move (B, Table, C),
Move (A, Table, B)]

Init (On (A, Table) ∧ On (B, Table) ∧ ....
Clear (B) ∧ Clear (C))

Goal (On (A, B) ∧ On (B, C))

Action (Move (b, x, y),

PRECOND : On (b, x) ∧ Clear (b) ∧ Clear (y) ∧
Block (b) ∧ Block (y) ∧ (b ≠ x) ∧ (b ≠ y)
∧ (x ≠ y),

EFFECT : On (b, Table) ∧ Clear (x) ∧ ¬ On (b, x))

Conclusion :-

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Thus, we understood planning in AI and was able to solve the blocks world problem by using appropriate planning techniques.