State-Space vs. Plan-Space

- **State-space** (**situation space**) planning algorithms search through the space of possible states of the world searching for a path that solves the problem.

- They can be based on **progression**: a forward search from the initial state looking for the goal state.

- Or they can be based on **regression**: a backward search from the goals towards the initial state

- STRIPS is an incomplete regression-based algorithm.

- **Plan-space** planners search through the space of partial plans, which are sets of actions that may not be totally ordered.

- **Partial-order** planners are plan-based and only introduce ordering constraints as necessary (**least committment**) in order to avoid unecessarily searching through the space of possible orderings.

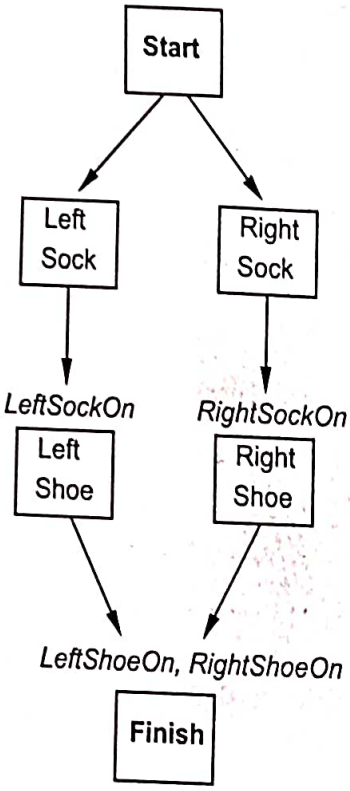
Total order planning → explores only strictly linear sequences of actions, directly connected to the start or goal.
Cannot learn use problem decomposition.

Partial Order Plans

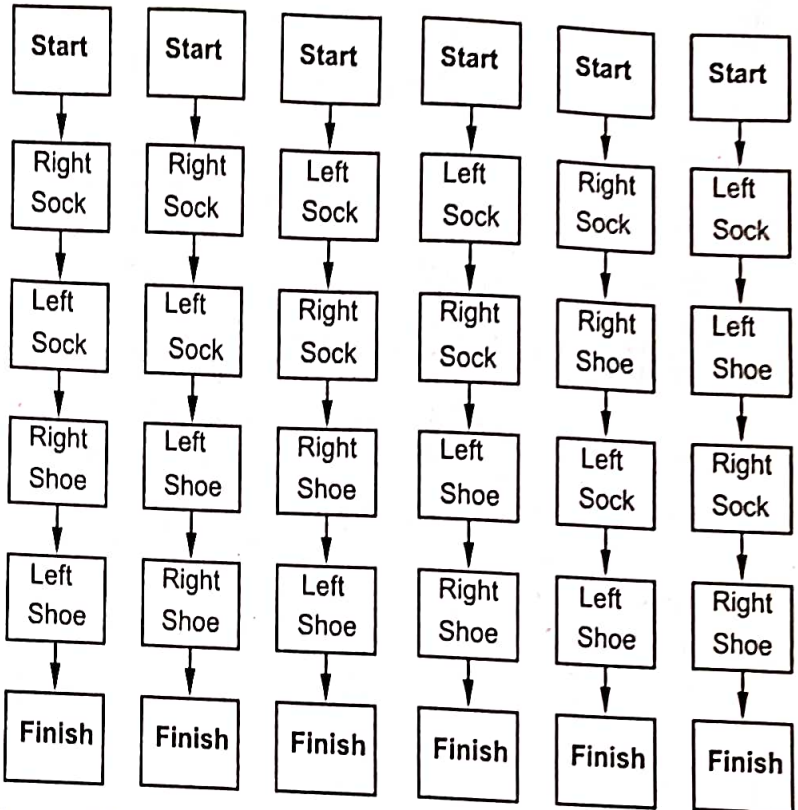
① works on several subgoals independently.
② solves them with sub plans
③ combines sub plans
④ flexible in ordering subplans.
⑤ actions must be – unordered or sequenced

- Plan in which not all actions are ordered

Partial Order Plan:



Total Order Plans:



- Goal (Rightshoe on ∧ leftshoe on)
- Init ()
- Action: Rightshoe on
  - Precondition – Right sock on
  - effect – Right shoe on
- Action : Right sock on
  - P – None
  - E – right sock on
- Action: Left shoe on
  - P – left sock on
  - E – Left shoe on
- Action: Left sock on
  - P – none
  - E – Left sock on.