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To understand State Space problem formulation.

Aim : To understand state space based problem formulation of AI problem so that problem solving Agent can be applied.

Theory : First we understand the problem solving agent. Algorithm shown in figure shown agent program for problem solving agent. Agent first formulates goal and problem.

function SIMPLE - PROBLEM - SOLVING - AGENT .(percept) returns on actions.

Static seq. on action Sequence, initially empty.
state, some description of the current world state.
goal a goal initialy null.
problem a problem formulation

```
State ← UPDATE- STATE (state, percept)
if seq is empty then do
goal ← FORMULATE - GOAL (state)
problem ← FORMULATE - PROBLEM (state, goal)
seq. ← SEARCH (problem)
action ← FIRST (seq)
seq ← REST (seq)
return action
        Problem solving Agent Architecture.
```

Initial State : it is the starting state that the problem is in

Actions : It defines all possible actions available to the the agent, given it is in some state s currently.

Transition Model :- also known as Successor function which define which state the system tend to move to when a particular action is executed by the agent.

Goal Test :- this act as a stopping condition when state passed to this function is goal state it will return true and searching would stop.

Path Cost :- It is accumulated cost of performing certain sequence of action

Working :- Based on understanding of problem formulation students need to formulate following problems.

1. Navigate to KGCE workshop from HOD IT Cabin with minimum number moves. can be climbing

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2. 8 puzzle problem.

3. The missionaries and cannibals problem. There are three missionary and three at most two people, under the constraint that, for both banks, if there are missionaries present on the bank, they cannot be outnumbered by cannibals (if they were the cannibals would eat the missionaries.

4. N Queen's problem Arrange N queens on a N cross N chess board where no two Queens attack each other

5. Two room vaccum cleaner world.

6. Water Jug problem.

Resources: Refer to second chapter from Artificial Intelligence: A Modern Approach.