K.G.C.E.
Karjat - Raigad

Tutorial-02

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

Theory: Agent first formulates goal and problem, then determine or rather searches an action sequence, after which it returns the next action to be executed in a sequential manner.

Function: SIMPLE-PROBLEM-SOLVING-AGENT returns an action.
Static: Seq; an action sequence, initially empty
state, some description of current world
state goal: a goal, initially null.
problem: a problem formulation.
state ← Update-STATE (state, percept)
if seq is empty then do
goal ← FORMULATION-GOAL (state)
problem ← FORMULATE-PROBLEM (state, goal)
seq ← SEARCH (problem)
action ← FIRST (seq)
seq ← REST (seq)
return action.

- Initial state - It is the starting state that the problem is in.

- Actions - It defines all possible actions available to the agent, given it is in some state currently. It is the function Action that returns list of all

possible actions.

- 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 the state passed to this function is goal state it will return true & searching would stop.

- Path Cost : It is accumulated cost of performing certain sequence of actions. This can help in determining weather the action sequence under consideration is optimal.

This a problem can formally specified by identifying initial ~~size~~ state, actions, transition model, goal state, optimal solution is the lowest path cost of all solutions.

Working: They will deadly show state space up to depth level 3 which ever is shallowest.

1. Navigate to KGCE workshop from HOD IT cabin with minimum number of moves, moves can be climbing or alighting staircase turning left right, walking through a corridor.

2. 8 Puzzle Problem.

3. The missionaries and Cannibals problem. There are three missionaries & three Cannibals who must cross a river using a boat which can carry 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 problems, 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.