Date :

Tutorial 2

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Tutorial 2 :- To understand State space problem formulation.

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

Theory :- First we understand the problem Solving agent, Agent first formulates goal & problem, then determines of rather searches an action sequence after which it return the next action to be executed in maner.

Function SIMPLE-PROBLEM-SOLVING-AGENT (Percept) returns an action

Static : seq, an action sequence, initially empty
State, some description of the current world state
goal, a goal, intially null
~~If~~ 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)

Date :

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 s currently. It is a function Action (s) that return list of all possible actions.

Transition Model :-

Also known as successor functions which define which state is the system tend to move to when a particular action is executed by the agent. Successive application of transition model gives rise to what is known as state space.

Goal Test :-

This act as a stoping condition when then 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.

Date :

Thus a problem can formally specified by identifying initial state, actions, transition model, goal test and path cost, In term of problem solving agent solving is the path from initial state to the goal state.

Working :-

They will clearly show state space up to depth level 3 or till goal node which ever is shallowest.

1) Navigate to KGiCE workshop from HoD I.T Cabin with minimum number of moves can be climbing of alighting staircase, turning left, right, walking through a corridor.

2) 8 Puzzle Problem.

3) The missionaries and cannibals problem. There are three missionaries and 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.

Date :

4.) N Queen's problem, Arrange N queen on a N Cross N chess boards where no two queens attack each other.

5) Two room vacuum cleaner would

6) water Jug problem

Resources :-

Refer to second chapter from Artificial Intelligence. A Mordern Approach.