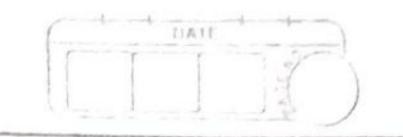


Tutorial 2: To understand state space problem formulation Aim: To understand state space based problem formulation of AI problems so that problem solving Agent can be applied. Theory:- First we understand the problem solving agent. Algorithm shown in fig. I shows agent program for problem solving agent. Agent first formulates goal & problem, then determines or rather searches an action sequence, after which it tyrns the next action to be executed in a sequential manner. function SIMPLE-PROBLEM-SOLVING-AGENT (percept) returns an action static: seq, an action sequence, initially empty state, some description of the cyment world state goal, a goal, initially 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 (seq) action < FIRST (seq) seq <- REST (seq) return action Fig 3: Problem Solving Agent Architechture Defining the problem is reffered to as problem formulation. It involves defining following five things: · Initial State: It is the starting state that the problem is in

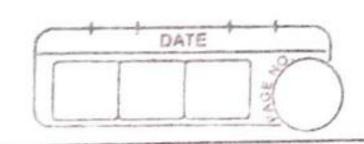


- Actions: It defines all possible actions available to the agent, given it is in some states charty cymently. It is a function Action (s) that returns list of all possible actions.
- Transition Model: also known as syccessor function which define states the system tend to move to when a perticular action is executed by the agent. Syccessive application of transition model gives rise to what is known as state space.
- · Croal 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 Gost: It is accumulated cost of performing certain—sequence of actions. This Can help in determining whether the action is the lowest path sequence under consideration—is optimal.

thus a problem can formally specified by identifying initial - state, actions coperators), transition model (successor function), - goal test & path cost. In term of problem solving agent - solution is the path from initial state to a goal state, - optimal solution is the lowest path cost of all solutions. - Process of finding a solution is called search.

Working: - Based on understanding of problem formulation students need to formulate following problems. They will Clearly slow state space up to depth levels or till goal mode which ever shallowest.

O Navigale to KGCE Workshop from HOD IT Cabin with minimum number of moves, moves can be climbing or alighting stalrease, tyrning left, right, welking through



	a corridor.
	@ 8 puzzel problem.
	3 The missionarise & cannibals problem. There are three
	missionaries & three annibals who must cross a river
	using a boat which can carry at most two people, under
	the contraint that, for both banks, if there are missionarie
,	present on the bank, they cannot be outnumbered by
7 7	cannibale if they were, the cannibals would eat the
	missionaries. The boat cannot cross the river by itself
	with no people on board.
	(9) N queen's problem, Arrange N queens on a N cross N chess
	bogred where no bogred two queens attack each other.
	O Two rooms vaccum cleaner world.
	@ Water Jug problem
r	3. 1
	Resources: Refer to second chapter from Artificial
	Intelligence: A Modern Approach.
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