

Tutorial No - 2

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Tutorial 2

To understand state space problem formulation

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

Theory - First understand the problem solving agent Algorithm shown in figure shows agent program for problem solving agent. Agent then determined whether searches an action sequence, after which it return the next action to be executed in a sequential manner.

Defining the problem is referred to problem formulation. It involves defining following like thing.

Initial state it is starting state that the problem is in. Action He holds following all possible actions some state currently. It is function all possible action.

Function SIMPLE-PROBLEM-SOLVING-AGENT
re an action

Static - seq. an action sequence, initially empty
state, some description of the
winning world state

goal a goal initially null.

problem a problem formulation

State \leftarrow UPDATE-STATE (state percept)

if seq - empty then do

goal - FORMULATE GOAL

goal - FORMULATE - GOAL (state)

problem \leftarrow FORMULATE (problem)

action (state, goal)

seq - SEARCH (problem)

action \leftarrow FIRST (seq)

seq \leftarrow REST (seq)

return action

Problem Solving Agent Architecture

Which define which states the system tends to move to when particular action is executed by transition model gives rise to what is known as state space

Goal Test This act as stopping condition when the state passed do this function is goal state it will return true searching would stop

path cost It is accumulated cost of performing certain action sequence under consideration optional

Thus a problem can formally specified by identifying initial state, action transition model (successor function) goal test & path cost.

working: Based on understanding of problem formulation students need to formulate following problem.

1. Navigate to KGCE workshop From HOD IT Plabin with minimum number of moves. Can be climbing or alighting, turning left, right, walking through.
2. Puzzle problem
3. The missionaries & cannibals problem. There are three missionaries & three cannibals who must cross a river. Two people under consideration that be both banks. If there are missionaries present on the bank they cannot be outnumbered by cannibals. If they move the cannibals would put the missionaries. The boat cannot cross the river by itself with no people on board.
4. N Queens problem. Arrange N queens on an $N \times N$ chess board where no two queens attack each other.

6. water Tug problem

Resources Refer to second chapter
From Artificial Intelligence
A modern Approach