Jagotbondhu Mondal.
ID: 212121 0051

P-1

CSI - 341
Artificial Intelegence.

Ans to the Ques NO°- 1(a)

* List of blind Search algoritham and conitive their properties :-
uniform Search is a class of general purpose Search algoritham which operates is brute force way- it is also called blind research various types of blind research one below.

i) Breadth - first Search.
ii) Depth - first Search.
iii) Depth - limited Search.
iv) Heruristive depth - First Search.
v) uniform cost Search.
vi) Bi directional Search.

* Breadth - first :- i) It is the first and most common Search Strategy. for traversing a tree on graph. this algoritham Seconden. breated coise in a tree. so its called breadth - first Search.

(ii) It is implemented using FIFO queue data structure search.

* Depth-first Search :- (i) It is a recursive algorithm for traversing a tree or graph data structure

(ii) It is called the depth-first because it starts from root node and follow each path to its greatest-depth node-before moving the next path.

(iii) DFS uses a stacks data structure for implementation,

* Depth-limited Search :- (i) It is a searching algorithm used for traversing a weighted tree or graph.

(ii) Uniform cost search is optimal because at every state the path with the least cost of chosen.

Ans to the Qus No - 1 (b)

Four general Steps of problem Solving given are below. :-

(*) Define the problem :- when ever a problem arises the agent must first difine problem to an extent

(i) Specify underlying causes.

(ii) Differentiate fact from opinion.

(iii) State the problem Specifically

(iv) avoid trying to solve the proble without data.

* State space :- (i) Convert the problem Statement

(ii) A State space is the Collection of all possible valid States that an agent can reside in.

(iii) ponponde alternative initiality.

(iv) Such alternative may solve the problem

* ather knowledge :- (i) called and Isolate the knowledge which is required by the agent to solve the Correct problem.

(ii) This knowledge gathering is done from both the pre-embeded knowledge in the System and the knowledge it has gathered.

(iii) Evaluates both proven and possible outcome.

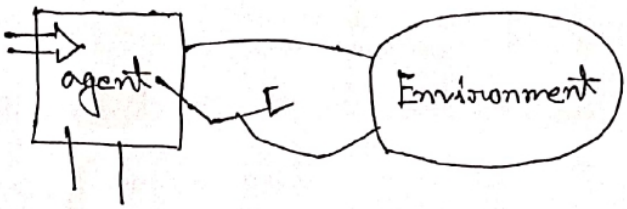
* planing :- (i) A problem may not always be an isolated problem. It may Contain various related problem as well as some related areas where the decision made with respect to the Correct problem Can effect those areas.

(ii) plan and implement a pilot test at the chosen alternative.

(iii) aather Feedback from all affected parties.

Ans to the Qus No - 4 (a)

Problem-Solving Agent with Diagram :-



(i) Formulate Goal
(ii) Formulate problem.
(iii) States
(iv) Action
(v) Find Solution.

* Intelligent agent are supposed to maximise there performance. measure.

* This can be simplified if the agent can adopt a goal and aim.

Goal Formulation :- based on

the Current situation and the agents

performance mesure is the first step. in proble solving Goal is a set of state. The agent task is to find out which sequence of action get it to a goal state

problem Formulation :- is the process of deciding what short of action and states to consider given a goal.

(i) An agent with several immediate options of unknows value can beside what to do by first examing different possible sequence of action that lead to states of known value.

(ii) Looking for such a sequence is called Search.

(iii) A Search algorithm takes a problem as input and returns a solution in the form of action sequence.

(iv) one a Solution is found the action it recomends can be carried out exection phase.

(v) Formulate, Search execute design for the agent.

(vi) After formulating a goal and problems to solve the agent call a search procedure to solve it.

(vii) Then removing that state from the sequence

(viii) Once the solution has been executed The agent will formulate the new goal

Ans to the Qus NO:- 4. (b)

Limitation of DFS:- Depth first search is an algorithm for traversing or searching tree or graph data structure, The algorithm starts at the root node and explores as far as possible along each branch be fore break-tracking

Advantages of DFS :-

(i) The memory requirement is linear WRT nodes

(ii) Less time and space complexcity as than then BFS.

(iii) The solution can be found out without near more search.

disadvantages of DFS :- (i) Not sure feed that it will give your solution.

(ii) Cut-off depth is smaller so time Complexcity is more

(iii) Determination of depth until the search has proceeded.

Application of DFS :-

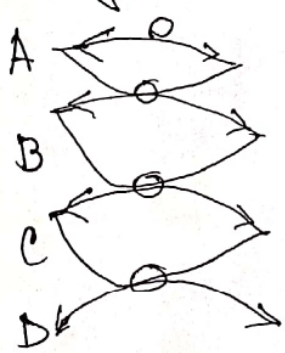
(i) Finding Connected Components.

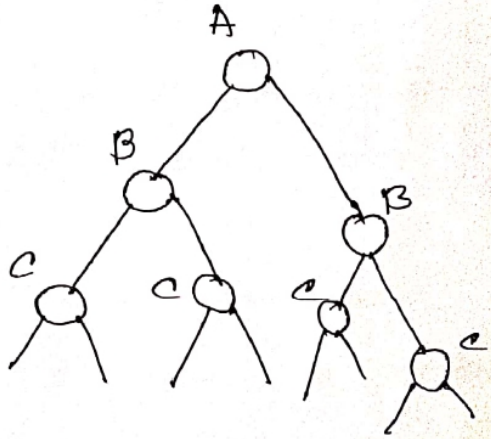
(ii) Topological sorting

(iii) Finding bridges depth graph

Ans to the Qn NO - 5.A

Avoiding Repeated States :- we have so far ignored on of the most important complication to the search process, they possibility of wasting time by expanding states that have been already encountered





There are three way to deal repeated States in growing order of effective and Complex,

(1) Do not return to the state you just Come from.

(2) Do not create path with cycle in them.

(iv) Do no generate any state that was ever generated before.

* Requires comparing state descreption
* Breadth - first Strategy:
* keep track of all generated States
* if the state of new node already exsits then descred the node.

Solution - 1 :- (i) Keep track of all states associated with nodes in Current fore

(ii) if the state of a new node already exsits then descred the node

∴ avoids loops

Solution - 2 :- (i) Keep Track of all state generated so far.

(ii) if the Satates of a new same here

∴ Space Complexity of breadth-first Algorithm.

Ans to the Qs No - 5 (B)

Real - world problem :-

(i) Towering problem :- visit every city atleast once. Starting Sending in Bucharest.

(ii) Traveling Sales problem: exactly once

(iii) Robot Navigation

(iv) Internet searching :- Software robot.

Example of algorithm :-

(i) Sooling papers Imagine a teacher Sooling their students papers acroding to the alphabetical order on their first name.

(ii) Facial Recognition

(iii) Google Search.

(iv) Duplicates outcoms

(v) Traffic light

(vi) Bus Schedule.

(vii)

(VII) Tying your shoes Any step by step process that is completed the same way every time is an algorithm.

(VIII) classifying objects

(IX) Bed time Routines

(X) Deciding what to eat.

(XI) Driving to from some where

(XII) Finding Library - Book.

(XIII) Folding the reciept.

Ans to the que NO -