Tutorial -2

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Tutorial 2:-	To	understand	State	Space	problem
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Tutorial 2: To understand State Space problem Formulation

Aim: - To understand State Space based problem Formulation of AI problems So trat problem Solving Agent Can be applied.

Theory: - First we understand the problem Solving agent. Algorithm Show in Fig Shows agent program for problem Solving agent. Agent first formulates goal and problem. Then determines or rather searches an action Sequence, after which it returns the next action to be executed in a Sequential manha.

Punction - STMPLE-PROBLEM-SOLVING AGENT (percept)
refurns an action

Static: Seq, an action Sequence, initially empty
State Some description of the current world

goal, a goal rinitially null
problem, a problem formulation

State L Update-State (state, percept)

if seq is empty then do

gog! L Formulate - Gog! (state)

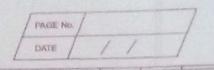
problem L Formulate - problems (state goal)

sea L search (problem)

action L First (seq)

Beger Rest (seq)

deturn - action



perining the problem is referred to as problem formulation. It involves derining pollowing five things:

Initial State: It is the Starting State that the problem

Actions - It defines all possible ations available
to the agent, given it is in some
States currently. It is a function Action(s)
that returns list of all possible actions.

Transition Model-also known as Successor Function Which define which states the Which states 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 Stopping Condition was
the slate passed to this function
is goal state it will return the and Searching
hould stop.

Path tost: - II-is accumulated cost of

Performing certain Sequence

of actions This Can belp in determining

Weather the action Sequence under ansidera
tran is appimal.

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Thus a problem can formally Specified by identifying initial State, action (operators) translion model (Sucresser Function), gail test and 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 in forcess of finding a solution is Called Search.

Working: - Based on understanding of problem Formulation Students need to formulate following problems they will clearly show state space up to depth level 3 or till gogs mode which ever is shallowest.

I-Navigate to KGRE Workshop from HODIT

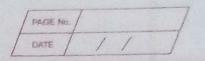
Cubin with Minimum number of moves, moves

Can be Climbing evalighting Starrase, turns

left, right, walking through a comidor.

2. 8 puzzle problem.

3. The Mission gries and Cannibals problem
There are three Missionares and three
Cannibals who must cross ariver using a
boul which can carry at most two people,
und the Constraint that crov both banks, if
there are Missionaries, present on the bank
they cannot be out numbered by Canniba
if they were, the Cannibals would eat
the Missionaries The boal, carrot corosi there



by itself with no people on board.

- 4. N Queen's problem, Away Noveens on Nooss N chess board
- 5. Two vorm varium cleaner word
- 6. Water jug problem

Resources - refer to second Chapler from Artificial
Intelligence. A Moders Apprach.