SVKM'S
NMIMS
Deemed to be UNIVERSITY

SUPERVISOR'S SIGNATURE WITH DATE: Gupta 12/9/14

DATE: 17/9/14

ROLL NO. A059

NAME: Chinmay Parikh TRIMESTER/SEMESTER: 7 DIVISION: A

PROGRAMME: B Tech

SPECIALISATION: IT

MODULE (SUBJECT): A. I.

TOTAL NO. OF SUPPLEMENTARY SHEETS ONLY: 1

QUESTION NOS.	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL MARKS OBTAINED	MAXIMUM MARKS
(MARKS OBTAINED) (TO BE FILLED IN BY EXAMINER)	3	4.5	5										13	15

Gupta.

SIGNATURE OF THE EXAMINER

INSTRUCTIONS TO BE STRICTLY FOLLOWED BY CANDIDATES

1. This answer-book contains eight pages. Check whether the relevant answer-book provided contains eight pages and whether the pages are properly numbered.
2. Candidates should occupy the correct seats as per the seating plan displayed and write appropriate details in the space provided for the purpose on the answer book.
3. Candidates must produce their photo identity card provided by the University for verification to the room supervisor during the examination. Candidates will not be permitted to appear for the examination without the identity card.
4. As per rules, Candidates, who are not in their seats by the time notified, will not be permitted to appear for the examination.
5. Candidates should ensure that all answer-books including supplementary sheets provided to them bear the signature of the room supervisor and date of examination without which the answer-book will not be examined.
6. Tie all supplementary sheets to the main answer-book relating to the same paper and enter on the first page of the answer-book only the total number of supplementary sheets tied together.
7. Begin answer to each question on a new page. For each answer, write the corresponding question number in the left hand side margin.
8. Do not write anything in the right hand side margin provided for marks to be assigned by the examiner.
9. Candidates will not be permitted to leave the examination hall until half an hour is over after the question papers are distributed. Apart from certain specific conditions such as medical emergency, natural calamity etc., candidates will not be allowed to leave the examination hall during the examination until they submit their answer-book to the room supervisor.
10. Every candidate present must sign against his / her student number on the attendance sheet provided by the room supervisor.

(P.T.O.)

stion | Marks Awarde

1] PEAS

P- Performance

E- Enviroment

A - Actuators

S - Sensors

PEAS is used to identify / classify agents and their environment.

Example Automated Taxi Driver

P- Trip time, fuel efficiency.

E - Stochastic, partially observable, Sequential, continious, multi-agent, Dynamic

A - Accelerator, brake, gear, turning lights, headlights, steering wheel and system.

S - Accelerometer, odometer, GPS, Rear-head camera, Antennas for comm^{n} with other taxis.

P.T.O.

Question Nos

PEAS for WUMPUS World

P - No. of Steps taken to reach goal.

E - Deterministic, Sequential, Discrete, partially observable, single agent, Static

A - Movement in tiles ; up, down left, right. Shooting Javelin one tile ; up, down, left, right.

S - Cell Status (All possible states like stench, breeze, etc).

Performance is chosen as number of steps, since you either reach goal state, or die or stuck. So lesser no. of steps taken (tiles traversed) is better.

E - Deterministic, through cell status one can accurately predict the next possible set of states and with more information, the probability of wumpus or pit.

Seq - Backtracking

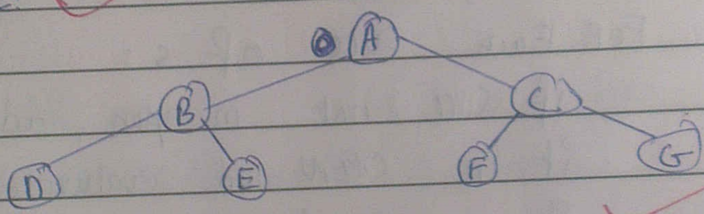
Discrete, single agent, static - It's a 4x4 grid, with one agent and no external stimuli.

Partially Observable - Only cell status of current tile is known.

5]

BFS	DFS
Breadth First Search	Depth First Search
Uninformed Search Technique	Uninformed Search Technique.
1] Searches a given graph level by level.	1] Searches a given graph's current fringe to it deepest level.
2] Uses FIFO data structure	3] Uses LIFO data structure
4] Graph = G Complexity $O(b^{m+1})$ m= max depth.	4] Complexity $O(bm)$

example:



In(S) = A
G(s) = G

BFS Traversal Path :
A, B, C, D, E, F, G

DFS Traversal Path :
A, B, D, E, C, F, G

Even though both BFS, DFS find goal state at roughly the same time in the example above, BFS consumes more space complexity due to its nature of storing all levels in memory, DFS stores only Path.

Best First Search

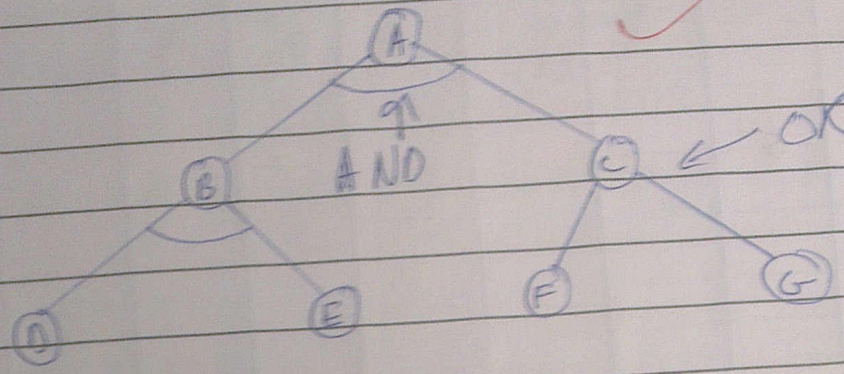
This is also called a greedy search technique, because it always selects the node closest to the goal.

Algorithm

OPEN = [In(S)]

loop until OPEN is empty, if empty report failure
let s be current OPEN node.
expand S, such that
FOR Each succ of s:
if succ not in open, add it in OPEN and evaluate its cost, If succ goal state then stop.
Remove S from OPEN
CURRENT = minimum (OPEN).

(5) AND - OR Graphs



Graphs with logical notations for AND and OR.

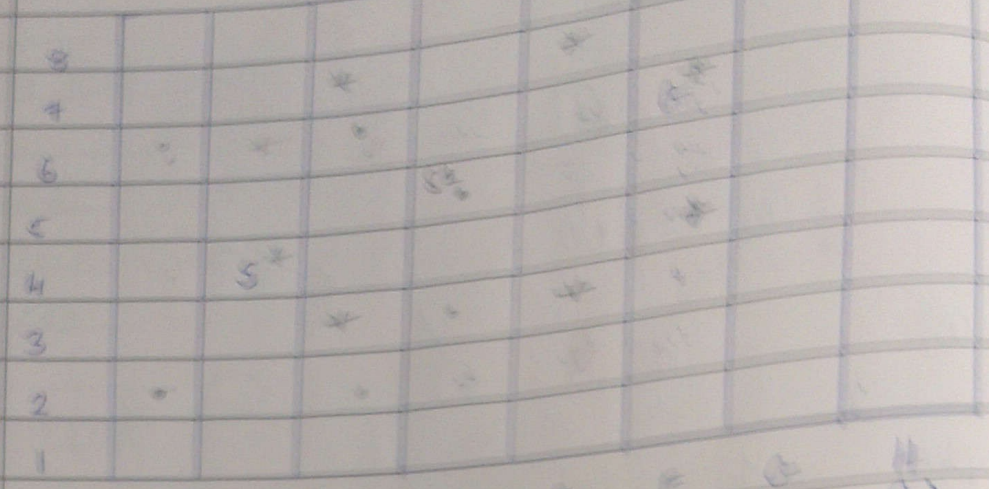
AND means all the successors of the current node need to be considered and evaluated.

OR means only one has to be considered and evaluated.

Usually used to decompose problem into subproblems until we reach a node which can be easily solved.

Hence using AND - OR notation allows us to easily specify proble

Question Nos



A B C D E F G H

(1) (2) (3) (4) (5) (6) (7) (8)

h(n) = ~~no. of vertical lines + no. of horizontal lines~~

All possible Knight moves from (2,4)

(2,4)

(4,2) (4,6) (5,6) (5,2) (6,3) (6,5)

↓ ↓ ↓ ↓ ↓ ↓

h(n) = 4.5 + 6 = 12.5 h(n) = 2 h(n) = 3.5 h(n) = 4.5 h(n) = 1.5

(6,6) (5,7) (6,4) (5,3) (3,3) (3,6) (3,7)

↑

Goal state stop

Path → (2,4) → (4,6) → (6,6)

Cost → (2,4) $\xrightarrow{2}$ (4,6) $\xrightarrow{4.5}$ (6,6)

0 1.5 0

4 + 1.5 = 6

Marks Awarded

Algorithm

① Check if initial node is terminal,
Yes: Stop
No: Continue

(1.1) CURRENT = initial node

② Loop until all valid paths done
expand CURRENT NODE
If CURRENT = AND type
apply $f(n) = h(n) + g(n)$
to all its successors, CURRENT=SUCCESSORS

Else
apply $f(n) = h(n) + g(n)$
to all its successors,
CURRENT = min(successors)
UPDATE COST for previous CURRENT
by Σ of all its successors $f(n)$

Repeat.

③ STOP

5

Why Pencil ?

Cost must be updated till parent node