Page No. 1
Date

Dr. D. Y. PATIL
Varale Campus

Assignment No: 2

Title :- A* algorithm for 8 puzzle problem.

Problem Statement :- Implement A star Algorithm for any game search problem.

Objective :-

* To understand the concept of informed search techniques.
* To implement A* algorithm for 8 puzzle game problem.

Theory :-

A* algorithm :-

A* is a computer algorithm that is widely used in path finding and graph traversal, the process of plotting an efficiently traversable path between multiple points called nodes.

The key feature of A* algorithm is that it keeps a track of each visited node which helps in ignoring the nodes that are already visited, saving a huge amount of time. It also have a list that holds all the nodes that are to left to

be explored and it chooses the most optimal node from this list, thus saving time not exploring unnecessary or less optimal nodes

Algorithm:-

1) Create a search graph G, consisting solely of the start node, no. Put no on a list called OPEN.
2) Create a list called close/CLOSED than is initially empty.
3) IF OPEN is empty, exit with failure
4) Select the first node an OPEN, remove it from OPEN, and on CLOSED. Called this node n.
5) If n is a goal node, exit sucessfully with the solution obtained by tracing a path along the pointer from n to no in G
6) Go to step 3

8 Puzzle Problem:-

In our 8-Puzzle prob we can define the h-score as the num of misplaced tiles by comparing the current state & the goal state or summa of the Manhattan distance between misp nodes.

g-score will remain as the number of nodes traversed from a start node to get to the current node. We can calculate the h-score by comparing the initial (current) state and goal state and counting the number of misplaced tiles

Conclusion :-

We have implemented BFS and DFS using recursive algorithm for undirected graph.

Coding Efficiency	Viva	Timely Completion	Total	Dated Sign of Course In-charge
5	3	2	10	

TS	PR	UC	VA	RN	Total marks
(2)	(2)	(2)	(2)	(2)	(10)
02	01	01	02	02	08 / 10