

AI-ML EXPERIMENT 3: REPORT

⇒ A* algorithm: It is informed search technique.
Heuristics: it takes into account the location of goal state & searches quite few nodes to reach goal.

Working: ① Assigns costs to each cell of maze.

$$② f(N) = g(N) + h(N)$$

$g(N)$: Actual cost from start node to n.

$h(N)$: Estimation cost from n to goal node.

Has two fns to estimate cost..

→ 1- Euclidean distance: linear distance b/w cell & goal cell.

→ Manhattan distance: Horizontal plus vertical distance b/w cell & goal cell.

*. RAT IN A MAZE :-

Pblm:- Given a maze of size $N \times N$. Source is @ top-left & goal is @ bottom-right corner r/c. Few cells are allowed to move while others are blocked. Find if there's any way to complete path & mark the corrected path.

1, 0, 0, 0, 0

1, 1, 0, 1, 0

0, 1, 1, 1, 0

0, 0, 0, 1, 0

1, 1, 1, 1, 1

Soln:- (1, 6, 7, 12, 13, 14, 19, 24, 25)

Soln:- class Maze: - i/p.

class Queue: - store the queue of nodes to be explored; pop fn returns nodes in the queue with the lowest

$f_{node} = g_{node} + h_{node}$ & removes it from queue.

class solver returns if there exists, any solution, by implementing A* algo over maze.

Function trace-path takes goal state node as argument & construct the soln string by following the parent attributes backwards until it initial state is reached.