EX.NO: 2 IMPLEMENTING INFORMED SEARCH ALGORITHMS LIKE A* AND MEMORY-BOUNDED A*

Aim:

The aim of a C program for implementing informed search algorithms like A* and memory-bounded A* is to efficiently find the shortest path between two points in a graph or network.

The A* algorithm is a heuristic-based search algorithm that finds the shortest path between two points by evaluating the cost function of each possible path.

The memory- bounded A* algorithm is a variant of the A* algorithm that uses a limited amount of memory and is suitable for large search spaces.

Algorithm:

Algorithm for A*

1. Initialize the starting node with a cost of zero and add it to an open list.
2. While the open list is not empty:

a. Find the node with the lowest cost in the open list and remove it.

b. If this node is the goal node, return the path to this node.

c. Generate all successor nodes of the current node.

d. For each successor node, calculate its cost and add it to the open list.

3. If the open list is empty and the goal node has not been found, then there is no path from the start node to the goal node.

Algorithm for memory-bounded A*

1. Initialize the starting node with a cost of zero and add it to an open list and a closed list.
2. While the open list is not empty:

a. Find the node with the lowest cost in the open list and remove it.

b. If this node is the goal node, return the path to this node.

c. Generate all successor nodes of the current node.

d. For each successor node, calculate its cost and add it to the open list if it is not in the closed list. e. If the open list is too large, remove the node with the highest cost from the openlist and add it to the closed list.

f. Add the current node to the closed list.

3. If the open list is empty and the goal node has not been found, then there is no path from the start node to the goal node.