

AI Lab 06

Section D

Task 01:

Uniform Cost Search is an algorithm used to move around a directed weighted search space to go from a start node to one of the ending nodes with a minimum cumulative cost. This search is an uninformed search algorithm since it operates in a brute-force manner, i.e. it does not take the state of the node or search space into consideration. It is used to find the path with the lowest cumulative cost in a weighted graph where nodes are expanded according to their cost of traversal from the root node. This is implemented using a priority queue where lower the cost higher is its priority.

Below is the algorithm to implement Uniform Cost Search:

- Insert Root Node into the queue.
- Repeat till queue is not empty:
 - Remove the next element with the highest priority from the queue.
 - If the node is a destination node, then print the cost and the path and exit
 - else insert all the children of removed elements into the queue with their cumulative cost as their priorities.

The example is explained in the following link: <https://www.educative.io/answers/what-is-uniform-cost-search>

Your task is to implement Uniform Cost Search to reach from Source to the destination nodes.

Task 02:

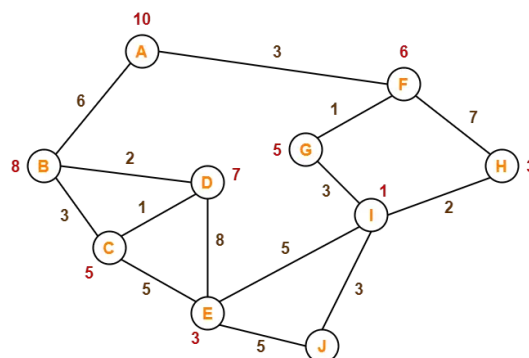
Given the graph, implement A* algorithm to reach from Source to destination node.

For Example: in the following graph:

The numbers written on edges represent the distance between the nodes.

The numbers written on nodes represent the heuristic value.

If we have to find the most cost-effective path to reach from start state A to final state J using A* Algorithm.



We will get the path: AFGIJ with A*