

THE

GRAPH SEARCH

[UNIFORM COST SEARCH]

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Question 1

1. Which of the following data structures can be used to implement Uniform Cost Search?

- a) Queue
- b) Stack
- c) Priority Queue
- d) All of the above

Answer: c) Priority Queue

Explanation:

Uniform Cost Search requires expanding the node with the lowest cost, which can be achieved through a priority queue. A priority queue is a data structure that can order items based on their priority, in this case, the cost.

Question 2

What is the advantage of using the A* algorithm over the Uniform Cost Search?

- a) A* algorithm guarantees finding the optimal path.
- b) A* algorithm is faster than Uniform Cost Search.
- c) A* algorithm can handle cycles in the graph.
- d) A* algorithm does not require a heuristic function.

Answer: a) A* algorithm guarantees finding the optimal path.

Explanation:

A* algorithm uses a heuristic function that estimates the cost from the current node to the goal, which allows it to avoid exploring unpromising paths. Therefore, A* algorithm is guaranteed to find the optimal path, unlike Uniform Cost Search.

Question 3

In Uniform Cost Search, what happens if two nodes have the same cost?

- a) Both nodes are expanded in a random order.
- b) Both nodes are expanded based on their order in the graph.
- c) Both nodes are expanded based on their heuristic value.
- d) Both nodes are expanded in a tie-breaking order.

Answer: d) Both nodes are expanded in a tie-breaking order.

Explanation:

In Uniform Cost Search, if two nodes have the same cost, they are expanded based on a tie-breaking order. This tie-breaking order can be implemented in various ways, such as expanding the node that was generated first or the node with a smaller identifier.

Question 4

In the Uniform Cost Search Algorithm, what happens if two paths have the same cost?

- a) Both paths are expanded in parallel
- b) The path with the smaller depth is expanded first
- c) The path with the larger depth is expanded first
- d) The order in which the paths are expanded does not matter

Answer: d) The order in which the paths are expanded does not matter

Explanation:

In the Uniform Cost Search Algorithm, if two paths have the same cost, they can be expanded in any order.

Question 5

I9. Which of the following is a heuristic function that can be used with the Uniform Cost Search Algorithm?

- a) Euclidean Distance Heuristic
- b) Manhattan Distance Heuristic
- c) A* Heuristic
- d) Depth-First Heuristic

Answer: c) A* Heuristic

Explanation:

The Uniform Cost Search Algorithm is an uninformed search algorithm, which means that it does not use any heuristic. However, the A* algorithm combines the Uniform Cost Search Algorithm with a heuristic function.