Due on 2019-09-11, 23:59 IST.

Mentor

1 point

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Unit 8 - Week 6 Course outline How to access the portal Pre-requisite Assignment Week 1 Week 2 Week 3 Week 4 Week 5 Week 6 Branch and Bound, Dijkstra's Algorithm ○ A* Algorithm Admissibility of A* Week 6 - Feedback : Artificial Intelligence Search Methods for problem Solving Quiz : Assignment 6 Week 7 Week 8 Week 9 Week 10 Week 11 Week 12 Week 13 Week 14 Week 15 DOWNLOAD VIDEOS Live Sessions

Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Topics: Branch & Bound, Algorithm A*, Admissibility of A*

NOTE: Wherever you are required to type in the answer (instead of clicking on a button) please DO NOT ENTER ANY BLANKS. This assessment is evaluated by a program that does exact string matching. An extra blank in the answer will result in even a correct answer being evaluated as wrong. This "no blanks" policy will hold THROUGHOUT this course.

In this assessment we move to a state space that is a graph, and may have loops. The following policy applies throughout. If there is a tie between two or more nodes for being picked by the algorithm, then the tie is broken as followed - the node that comes earlier in the dictionary ordering is selected. For example, if there is a tie between M, F and R, then F is selected first because occurs earlier in the ordering A, B, .., Z

 Which of the following is/are true? The Branch and Bound algorithm exploits the heuristic value The Branch and Bound algorithm is oblivious to the goal node

The Branch and Bound algorithm searches in an iterative deepening manner The Branch and Bound algorithm is an uninformed search method

None of the above No, the answer is incorrect.

Score: 0 Accepted Answers: The Branch and Bound algorithm is oblivious to the goal node

The Branch and Bound algorithm is an uninformed search method

No, the answer is incorrect.

No, the answer is incorrect.

No, the answer is incorrect.

Accepted Answers:

Accepted Answers:

Score: 0

Score: 0

Identify the true statements for a node N on the OPEN list of the A* algorithm

g(N) is the actual cost of path found from Start to N g(N) is the actual cost of path from N to Goal g(N) is the estimated cost of path found from Start to N

g(N) is the estimated cost of path from N to Goal h(N) is the actual cost of path found from Start to N

h(N) is the actual cost of path from N to Goal h(N) is the estimated cost of path found from Start to N h(N) is the estimated cost of path from N to Goal

None of the above

Accepted Answers: g(N) is the actual cost of path found from Start to N h(N) is the estimated cost of path from N to Goal

The algorithm A* is admissible if (choose the three necessary and sufficient conditions)

the branching factor of each node is finite the branching factor of each node is less than 7

there are no loops in the state space h(n) is always strictly less than h*(n)

h(n) is always less than or equal to h*(n) g(n) is always less than h(n) g(n) is always greater than h(n) the cost of each edge is positive

the branching factor of each node is finite h(n) is always less than or equal to h*(n) the cost of each edge is positive

the cost of each edge is greater than some small constant

the given graph is finite and has a path to the goal node the given graph is finite and has no path to the goal node

The algorithm A* always terminates when

the cost of each edge is greater than some small constant

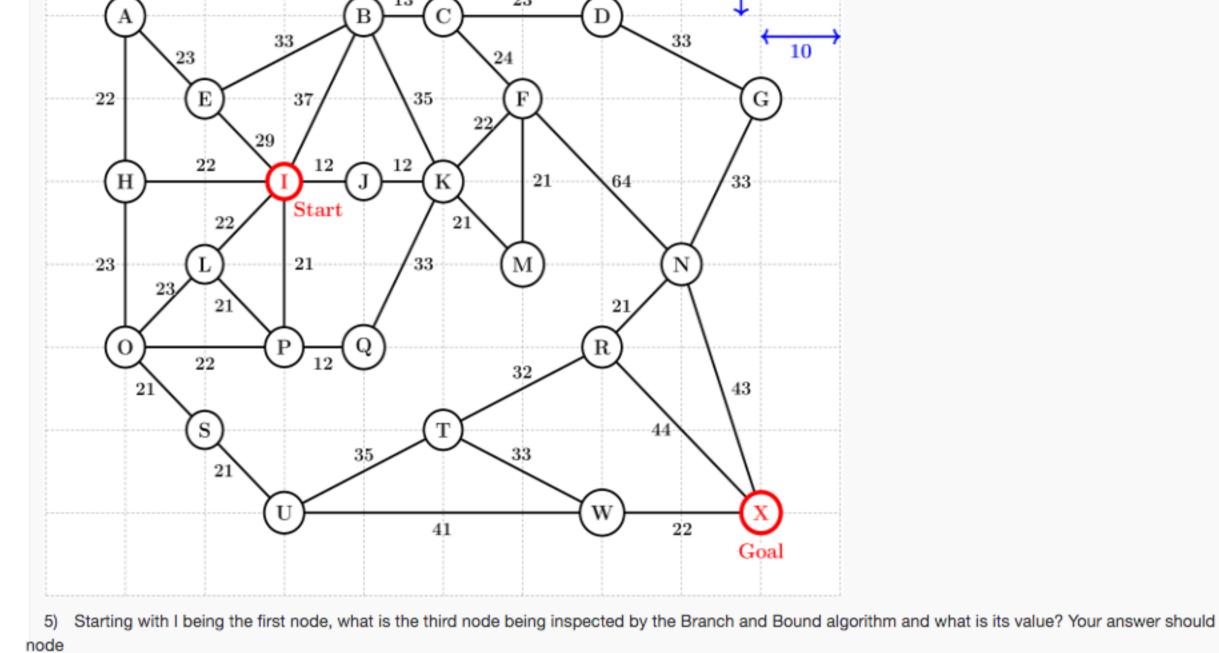
the given graph is finite and has a path to the goal node the given graph is finite and has no path to the goal node the given graph is infinite with finite branching and has a path to the goal node the given graph is infinite with finite branching and has no path to the goal node the given graph is infinite with infinite branching and has a path to the goal node

the given graph is infinite with infinite branching and has no path to the goal node

the given graph is infinite with finite branching and has a path to the goal node

The figure below depicts a search space in which the nodes are labeled with names like A, B, K, M. The topology is the same as in Figure 3.2 (in assignment 3), but each edge is labeled with a cost of traversing that edge. Node I is the start node. The nodes are laid out on a grid where each square is of size 10x10 units. There is only one goal node, X, to make the manual calculation of the heuristic function easier. Please use the Manhattan Distance as the heuristic function. For the questions below please enter the answer as a sequence of nodes separated by a comma. Please DO NOT enter any blanks. For example, if the

10



answer (order of nodes) is A followed by C, followed by N, followed by D, the answer should be Answer: A,C,N,D

Accepted Answers: (Type: String) P,21 (Type: String) P, 21

6) Starting with I being the first node, what is the fifth node being inspected by the Branch and Bound algorithm and what is its value? Your answer should

No, the answer is incorrect. Score: 0

followed by its value, for example, A,53

label followed by its value, for example, A,53

7) Starting with I being the first node, what is the ninth node being inspected by the Branch and Bound algorithm and what is its value? Your answer should node label followed by its value, for example, A,53

Accepted Answers: (Type: String) L,22 (Type: String) L, 22

No, the answer is incorrect.

Score: 0

node label

No, the answer is incorrect.

Score: 0 Accepted Answers: (Type: String) B,37

(Type: String) B, 37

Accepted Answers:

(Type: String) I,P,O,S,U,W,X

(Type: String) I, P, O, S, U, W, X

No, the answer is incorrect. Score: 0

8) What is the path found by the Branch and Bound algorithm in the previous question? If no path is found please enter 'NIL'

No, the answer is incorrect.

Accepted Answers:

Score: 0

Score: 0

policy

(Type: Numeric) 148

10) List the order in which the A* algorithm explores the graph till termination. Use Manhattan distance as the heuristic function. Please note the tie breaking

9) What is the cost of the path found (if any) by the Branch and Bound algorithm in the previous question? If no path is found please enter 'NIL'

No, the answer is incorrect.

Accepted Answers:

Cannot say

described at the top

11) Does algorithm A* find a path to the goal node in the previous question? ○ No

(Type: String) I,P,J,Q,K,M,L,F,H,O,S,U,W,B,X

(Type: String) I, P, J, Q ,K, M, L, F, H, O, S, U, W, B, X

No, the answer is incorrect. Score: 0 Accepted Answers:

No, the answer is incorrect. Score: 0

Accepted Answers:

Accepted Answers: (Type: Numeric) 148

(Type: String) I,P,O,S,U,W,X (Type: String) I, P, O, S, U, W, X

No, the answer is incorrect. Score: 0

13) What is the cost of the path found (if any) by the algorithm A* in the previous question? If no path is found please enter 'NIL'

12) What is the path found (if any) by the A* algorithm in the previous question? If no path is found please enter 'NIL'

14) When A* terminates, what are the nodes still on OPEN (excluding the goal node)? List them in alphabetic comma separated order (for example B,D,J)

(Type: String) A,C,E,N,T (Type: String) A, C, E, N, T

Accepted Answers:

No, the answer is incorrect.

Score: 0