Exam : End Term Quiz
Subject : AI
Total Marks : 23.00
QP : 2024 Apr28: IIT M FN EXAM QDF2

Exam Mode | Learning Mode

View Question Paper Summary

QUESTION MENU

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TIMER

00:13

CONTROLS

SUBMIT EXAM

Your Score
0.00 / 23.00
(0%)

Question 1 : 640653815666 Total Mark : 0.00 | Type : MCQ

THIS IS QUESTION PAPER FOR THE SUBJECT "DEGREE LEVEL : AI: SEARCH METHODS FOR PROBLEM SOLVING (COMPUTER BASED EXAM)" ARE YOU SURE

YOU HAVE TO WRITE EXAM FOR THIS SUBJECT? CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN. (IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

OPTIONS :

- ◯ YES
- ◯ NO

Your score : 0

Discussions (0)

Question 2 : 640653815667

Total Mark : 0.00 | Type : MCQ

OPTIONS :

- ◯ Printed graph sheets were provided to me.
- ◯ Printed graph sheets were not provided to me.
- ◯ I did not use graph sheets.

Your score : 0

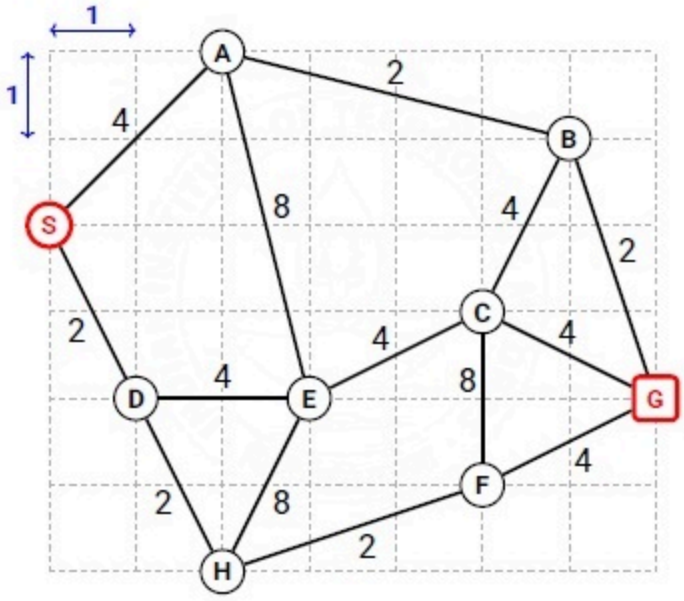
Discussions (0)

Question 3 : 640653815668

Total Mark : 0.00 | Type : COMPREHENSION

SEARCH

The figure shows a map on a uniform grid where each tile is 1x1 in size.
The start node is S and the goal node is G.
The MoveGen function returns nodes in alphabetical order.
Use Manhattan Distance as the heuristic function.
Tie-breaker: If several nodes have the same cost, use node labels to break the tie.



Based on the above data, answer the given subquestions.

Your score : 0

Question 4 :
640653815669

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the path found by the Best First Search algorithm? Enter the path as a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,D,E,C,G

Your score : 0

Discussions (0)

Question 5 :
640653815670

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the path found by A* search algorithm? Enter the path as a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,D,H,F,G

Your score : 0

Discussions (0)

Question 6 :
640653815671

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the path found by Branch-and-Bound search algorithm? Enter the path as a comma separated list of node labels. Use the Branch-and-Bound variation that avoids cyclic expansions like S,A,S,A,S,A,... NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format:S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,A,B,G

Your score : 0

Discussions (0)

Question 7 :
640653815672

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the given map, which algorithm finds the shortest path from S to G?

OPTIONS :

- ◯ Best First Search
- ◯ A* Search Algorithm
- ◯ Branch-and-Bound Search Algorithm
- ◯ None of these.

Your score : 0

Discussions (0)

Question 8 :
640653815673

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

What can you say about the heuristic function for the given graph?

OPTIONS :

- ◯ Admissible.
- ◯ Inadmissible.
- ◯ Partly admissible and partly inadmissible.
- ◯ Cannot be determined.

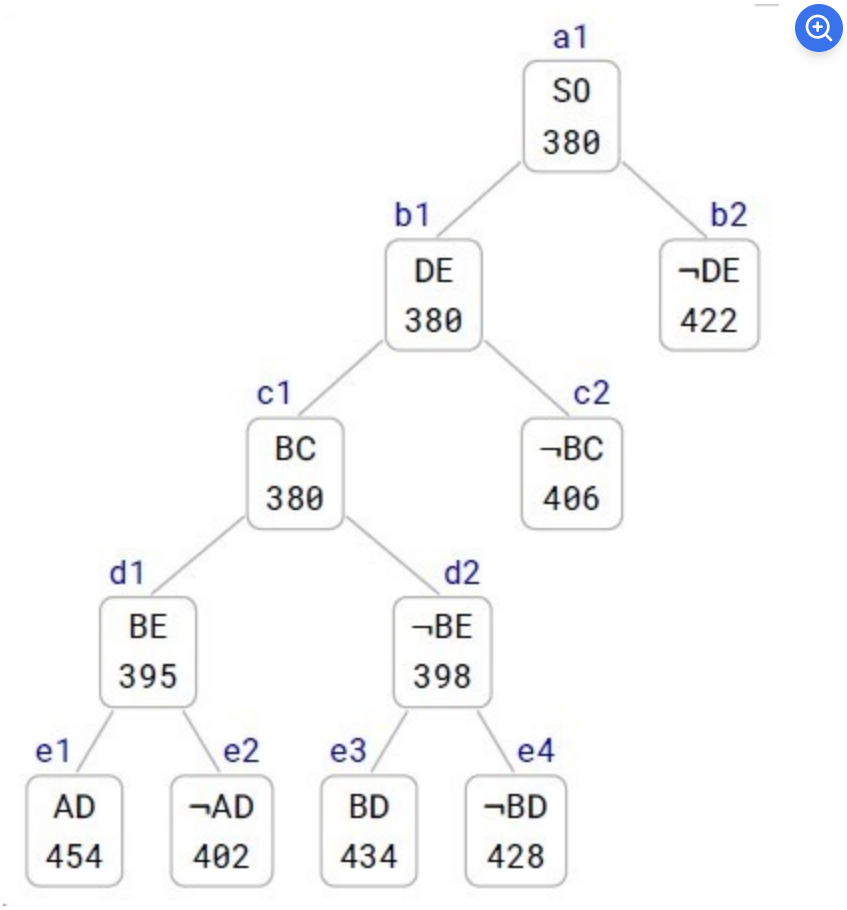
Your score : 0

Discussions (0)

Question 9 : 640653815674

Total Mark : 0.00 | Type : COMPREHENSION

TSP Branch-and-Bound The TSP Branch-and-Bound algorithm is solving a TSP instance where the cities are A, B, C, ... and so on. The Branch-and-Bound search tree at the time when the algorithm has discovered the optimal tour is shown below. Each node in the search tree displays an edge (either XY or ~XY), a cost value, and a unique reference number (a1, b1, b2, c1, c2, d1, d2, e1, e2, e3, e4). Use the reference numbers to break ties. When required, enter the reference numbers in short answers. What information can you glean from the search tree? Answer the sub-questions based on the information gleaned from the search tree. Based on the above data, answer the given subquestions.



Your score : 0

Question 10 :
640653815675

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Let S0 (ref. no. a1) be the first node to be refined, identify the next 4 nodes (2nd to 5th node) that are refined by the TSP Branch-and-Bound algorithm. Enter the nodes

(node reference numbers) in the order they are refined. Enter a comma separated list of node reference numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a9,b9,c9,d9

Answer (Alphanumeric):

Answer

Accepted Answer : b1,c1,d1,d2

Your score : 0

Discussions (0)

Question 11 :
640653815676

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Which node represents the optimal tour and what is the cost of the optimal tour? Enter the node reference number and the tour cost in the text box, or enter NIL if it is not possible to determine the optimal tour. Enter a node reference number followed by tour cost, separated by comma. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a9,42

Answer (Alphanumeric):

Answer

Accepted Answer : e2,402

Your score : 0

Discussions (0)

Question 12 :
640653815677

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Determine the number of cities in the TSP instance. Enter the number of cities in the text box, or enter NIL if it is not possible to determine the number of cities. Enter an integer. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 6

Your score : 0

Discussions (0)

Question 13 : 640653815678

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Start from city A, what is the path representation of the optimal tour? Enter the path representation in the text box, or enter NIL if it is not possible to determine the optimal tour. Enter a comma separated list of cities (city labels). NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: A,B,C

Answer (Alphanumeric):

Answer

Accepted Answer : A,C,B,E,D,F

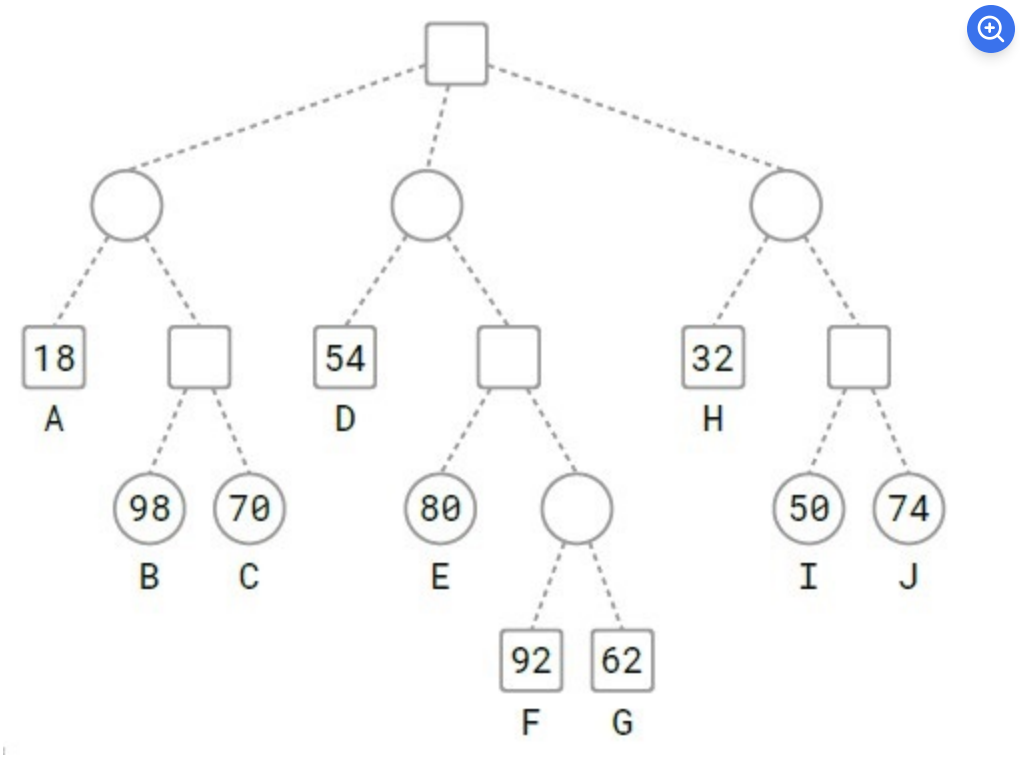
Your score : 0

Discussions (0)

Question 14 : 640653815679

Total Mark : 0.00 | Type : COMPREHENSION

GAMES The figure shows a game tree with evaluation function values at the leaf nodes. The leaf nodes are labeled from A to J. Use these labels to enter a leaf node or a list of leaf nodes in short answers (textbox). Tie-breaker: when several nodes carry the same best cost then select the deepest node, if tie persists then select the leftmost of the deepest nodes. Based on the above data, answer the given subquestions.



Your score : 0

Question 15 :
640653815680

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following is a strategy for the MAX player?

OPTIONS :

- [ ] A,C
- [ ] A,D,H
- [ ] D,F,G
- [ ] E,I,J

Your score : 0

Discussions (0)

Question 16 :
640653815681

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the leaf nodes in the best strategy for MAX. Enter the node labels in alphabetical order. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : D,E

Your score : 0

Discussions (0)

Question 17 :
640653815682

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the leaf nodes pruned by Alpha-Beta. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : C,F,G,I,J

Your score : 0

Discussions (0)

Question 18 :
640653815683

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the leaf nodes solved (assigned SOLVED status) by SSS*. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : A,D,E,H

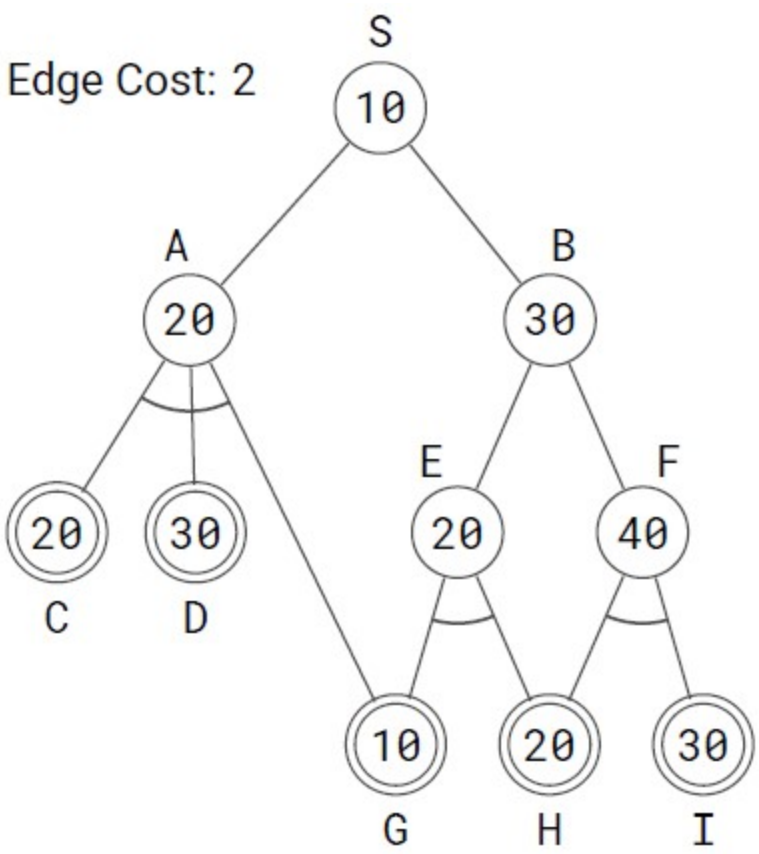
Your score : 0

Discussions (0)

Question 19 : 640653815684

Total Mark : 0.00 | Type : COMPREHENSION

PROBLEM DECOMPOSITION The figure shows an AND-OR graph that depicts how a problem S can be decomposed into one or more smaller problems. Nodes are uniquely identified by labels (S, A, B, ...). The number in each node is the heuristic estimate of the cost of solving that node. Nodes shown in double lines are primitive nodes and their values are actual costs. Observe that a primitive node is added to the graph by its parent when the parent is expanded, and the primitive node is labeled as SOLVED and it will not be expanded subsequently. The cost of each edge is 2 units. Tie-breaker 1: If several nodes have the same cost then break the tie using node labels. Tie-breaker 2: For AND nodes, select the unsolved branch with the highest cost. Use AO* algorithm to solve S, then answer the sub-questions.



Your score : 0

Question 20 :
640653815685

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the first three nodes (including S) expanded by AO* algorithm. List the nodes in the order they are expanded. Observe that primitive nodes are not expanded. Enter a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,A,B

Your score : 0

Discussions (0)

Question 21 : 640653815686

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Determine the value of the start node S after each node is expanded. What are the values of S after the 1st, 2nd and 3rd nodes are expanded, respectively? Enter the 3 values in the textbox. Enter a comma separated list of numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 12,42,17

Answer (Alphanumeric):

Answer

Accepted Answer : 22,32,24

Your score : 0

Discussions (0)

Question 22 : 640653815687

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the final value of the start node S? Enter a number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 38

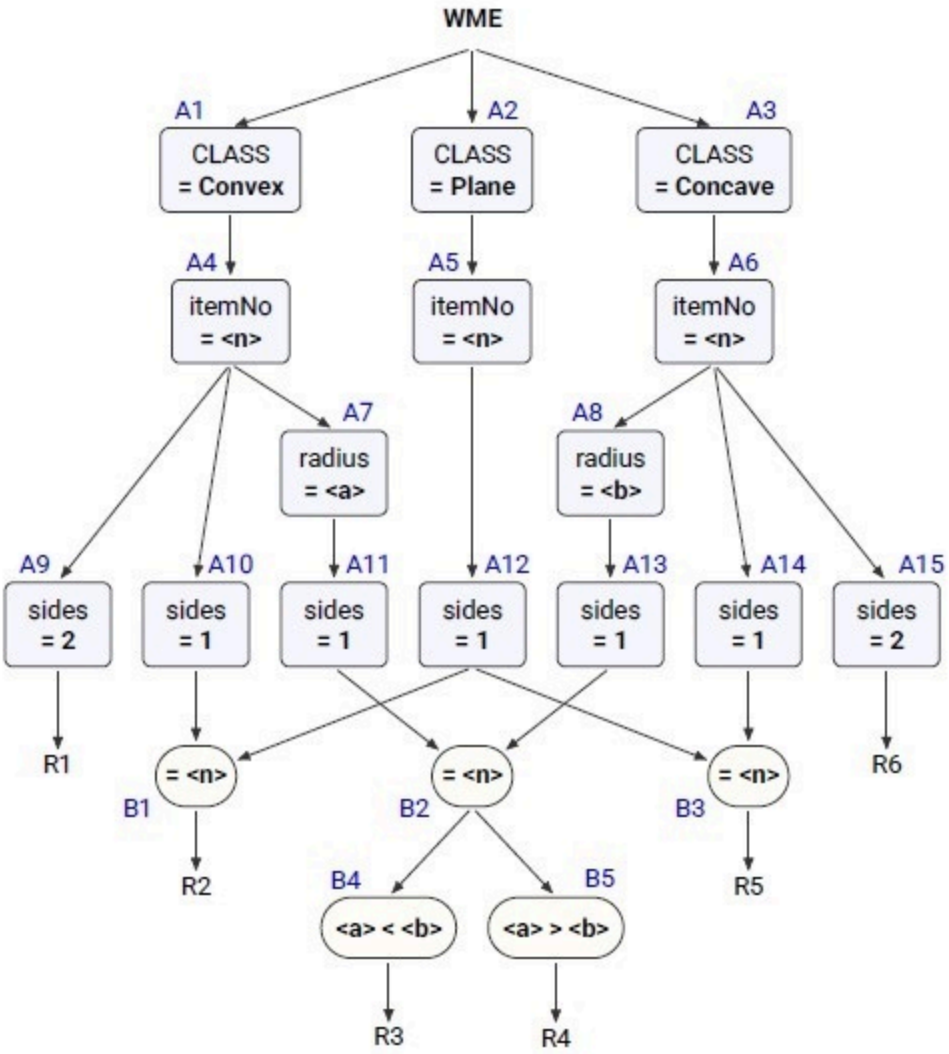
Your score : 0

Discussions (0)

Question 23 : 640653815688

Total Mark : 0.00 | Type : COMPREHENSION

RULE BASED EXPERT SYSTEMS A Rete Net for classifying lenses based on surface properties (convex, concave, planar, radius of curvature, and number of sides) is shown in the figure. Each lens is uniquely identified by “itemNo” attribute, the remaining classes and attributes are self explanatory. A part of the Rete Net that classifies mushrooms (as edible or poisonous) is shown in the figure. The labels A1, A2, ..., A15, ..., B1, B2, ..., B5, R1, ..., R6 uniquely identify the nodes in the network. When required, use the above label ordering to break ties and to enter short answers. Note: beta nodes B4 and B5 compare the radius of curvature of two surfaces.



Run the Rete algorithm for the Working Memory shown below, the WMEs are in timestamp order. Assume that WMEs reside at appropriate Alpha nodes, and the Beta nodes point to WMEs residing in Alpha nodes.

```
101.  (Concave ^itemNo K3 ^radius 70 ^sides 1)
102.  (Concave ^itemNo K7 ^radius 10 ^sides 3)
103.  (Convex  ^itemNo K2 ^radius 60 ^sides 1)
104.  (Convex  ^itemNo K3 ^radius 50 ^sides 1)
105.  (Convex  ^itemNo K4 ^radius 20 ^sides 4)
106.  (Plane   ^itemNo K2 ^sides 1)
107.  (Concave ^itemNo K1 ^radius 80 ^sides 2)
```

For each WME identify its location (node label) in the Rete Net, and prepare the conflict set for the first cycle, then answer the sub-questions.

Your score : 0

Question 24 :
640653815689

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following rule-data tuples are in the conflict-set?

OPTIONS :

- ◯ R1,105
- ◯ R2,103,106
- ◯ R4,102,103
- ◯ R5,102

Your score : 0

Discussions (0)

Question 25 :
640653815690

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

If the Inference Engine uses Specificity as the conflict resolution strategy then which of the following rule-data tuples will qualify?

OPTIONS :

- ◯ R1,105
- ◯ R3,101,104
- ◯ R4,102,103
- ◯ R5,102

Your score : 0

Discussions (0)

Question 26 : 640653815691

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

If the Inference Engine uses Recency as the conflict resolution strategy then which of the following rule-data tuples will qualify?.

OPTIONS :

- R2,103,107
- R3,101,104
- R4,102,103
- R6,107

Your score : 0

Discussions (0)

Question 27 : 640653815692

Total Mark : 0.00 | Type : COMPREHENSION

AUTOMATED PLANNING The domain description of a Blocks World with a single one-armed robot is given below. This is the same domain used in the assignments.

PREDICATES

armEmpty	The arm is not holding any block, it is empty.
holding(X)	The arm is holding X.
onTable(X)	X is on the table.
clear(X)	X has nothing above it, it is clear.
on(X,Y)	X is directly placed on Y.

OPERATORS

Pickup(X): pick up X from the table.

```
Preconditions: { armEmpty, clear(X), onTable(X) }
Add Effects  : { holding(X) }
Del Effects  : { armEmpty, onTable(X) }
```

Putdown(X): place X on the table.

```
Preconditions: { holding(X) }
Add Effects  : { armEmpty, onTable(X) }
Del Effects  : { holding(X) }
```

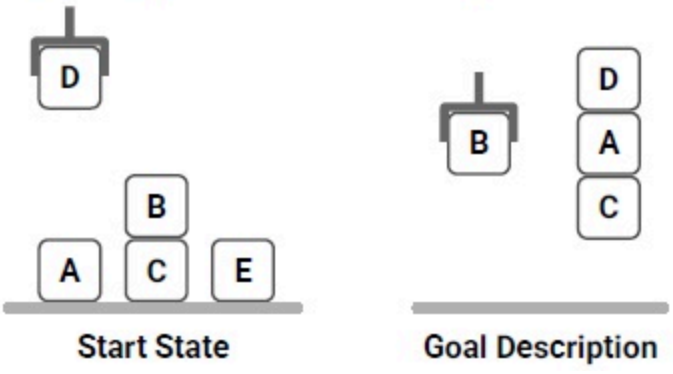
Unstack(X,Y): pick up X that is directly sitting on Y.

```
Preconditions: { armEmpty, clear(X), on(X,Y) }
Add Effects  : { clear(Y), holding(X) }
Del Effects  : { armempty, on(X,Y) }
```

Stack(X,Y): place X directly on top of Y.

```
Preconditions: { holding(X), clear(Y) }
Add Effects  : { armEmpty, on(X,Y) }
Del Effects  : { holding(X), clear(Y) }
```

Consider the planning problem with the following start state and goal description.



{ holding(D), clear(D), clear(A), clear(B), clear(E), on(B,C), onTable(A), onTable(C), onTable(E) }

{ holding(B), on(D,A), on(A,C) }

Based on the above data, answer the given subquestions.

Your score : 0

Question 28 :
640653815693

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are applicable actions in the start state?

OPTIONS :

- [ ] Putdown(D)
- [ ] Stack(D,C)
- [ ] Pickup(B)
- [ ] Stack(D,A)
- [ ] Stack(A,C)

Your score : 0

Discussions (0)

Question 29 :
640653815694

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are relevant actions in the goal state?

OPTIONS :

- [ ] Pickup(B)

- [ ] Putdown(D)
- [ ] Unstack(B,E)
- [ ] Stack(D,C)
- [ ] Stack(D,A)

Your score : 0

Discussions (0)

Question 30 :
640653815695

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

In the planning graph, which of the following are mutex action pairs in Layer 1?

OPTIONS :

- [ ] Unstack(B,C), Putdown(D)
- [ ] Stack(D,A), Putdown(D)
- [ ] Stack(D,A), NOP-ACTION for armEmpty
- [ ] Stack(D,A), Stack(D,E)
- [ ] Pickup(A), Putdown(D)

Your score : 0

Discussions (0)

Question 31 :
640653815696

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

In the planning graph, which of the following are mutex proposition pairs in Layer 1?

OPTIONS :

- [ ] on(D,A), armEmpty
- [ ] on(D,A), onTable(D)
- [ ] on(D,A), on(D,B)
- [ ] holding(D), clear(A)
- [ ] on(D,A), clear(A)

Your score : 0

Discussions (0)

SUBMIT EXAM