Exam : Quiz 2
Subject : AI
Total Marks : 30.00
QP : 2023 Aug: IIT M DEGREE AN2 EXAM QPE2

Exam Mode | Learning Mode

View Question Paper Summary

QUESTION MENU

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TIMER

00:12

CONTROLS

SUBMIT EXAM

Your Score
0.00 / 30.00
(0%)

Question 1 : 640653589839 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

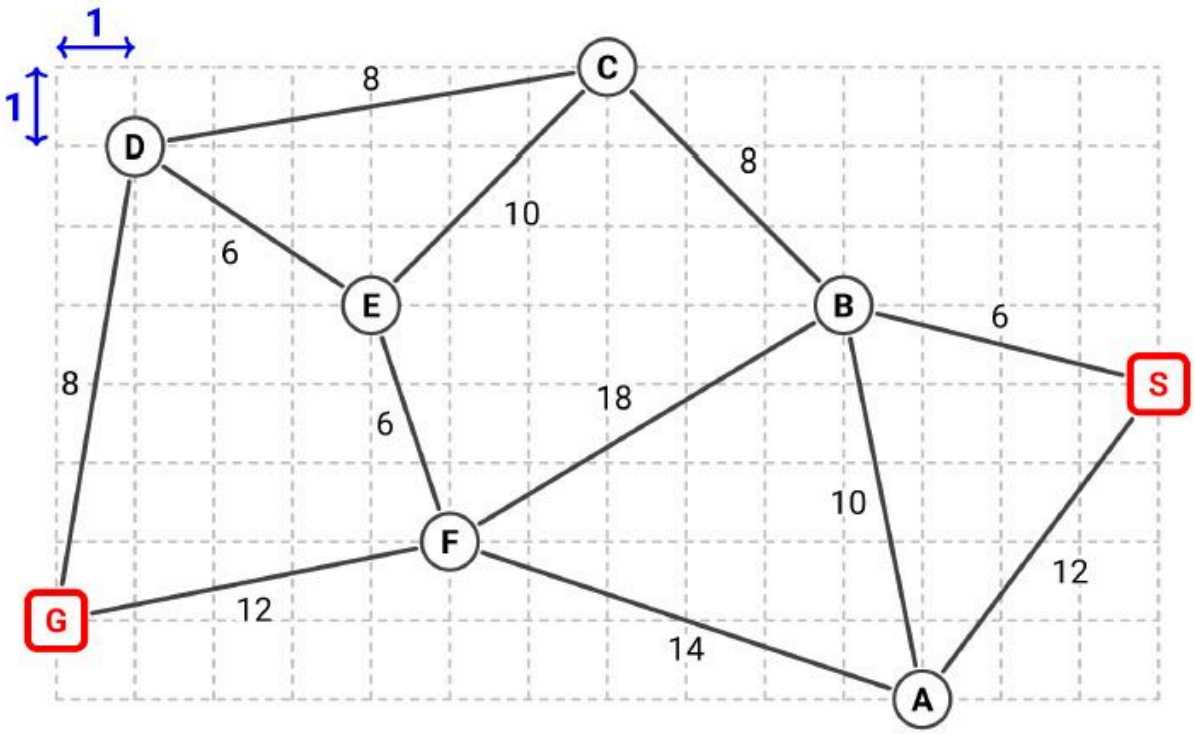
Discussions (0)

Question 2 : 640653589840

Total Mark : 0.00 | Type : COMPREHENSION

SEARCH

The figure shows a map with several locations on a grid where each tile is 1x1 in size. The locations are at grid points and are connected by two way edges (roads), where each edge has a cost that is the same in both directions. Observe that the edge costs are not necessarily proportional to the coordinate based distance estimates. The start node is S and the goal node is G, the MoveGen function returns neighbours in alphabetical order. Use Manhattan distance as the heuristic function. Tie-breaker: when several nodes have the same best cost, use alphabetical order to break ties. Emulate A*, wA* and Branch-and-Bound on the given map, then answer the given subquestions .



Your score : 0

Question 3 :
640653589841

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

In the map, S is the first node to be inspected, determine the next 4 nodes (from the 2nd to 5th node) inspected by A*. Enter the nodes in the order they were inspected. Enter a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: W,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : B,A,C,D

Your score : 0

Discussions (0)

Question 4 :
640653589842

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 4 nodes from the 2nd to 5th node, list the f-values of those nodes as a comma separated list. Enter a comma separated list of natural numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 2,7,1,8

Answer (Alphanumeric):

Answer

Accepted Answer : 20,24,28,29

Your score : 0

Discussions (0)

Question 5 :
640653589843

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 4 nodes from the 2nd to 5th node, list the parent nodes assigned by A*. Enter a comma separated list of parent node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: W,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,S,B,C

Your score : 0

Discussions (0)

Question 6 :
640653589844

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : SA

What is the final path found by A*? Enter the path as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format:

S,X,Y,Z,G

Answer (Alphanumeric):

Answer

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

Your score : 0

Discussions (0)

Question 7 :
640653589845

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

For w=2, what is the final path found by wA* algorithm? Enter the path as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z,G

Answer (Alphanumeric):

Answer

Accepted Answer : S,B,F,G

Your score : 0

Discussions (0)

Question 8 :
640653589846

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the path found by Branch-and-Bound algorithm? Use the Branch-and-Bound version that PREVENTS cyclic expansions like S,A,S,A,S,A,... Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 30

Your score : 0

Discussions (0)

Question 9 :
640653589847

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Is the heuristic admissible in the given map?

OPTIONS :

- Yes
- No
- Cannot be determined

Your score : 0

Discussions (0)

Question 10 : 640653589865

Total Mark : 0.00 | Type : COMPREHENSION

AUTOMATED PLANNING
The domain description of a blocks-world with a single one-armed robot is provided below. Note: this is the same domain description used in the weekly assignments. Subgoal ordering rule: treat the start state, goal description, preconditions and the effects as lists that are accessed from left to right. When the elements in a list are pushed one by one onto a stack, the last element in the list will be at the top of the stack. It has the effect of reversing the list. Tie-breaker for block placement: when there are multiple locations for placing a block, first choose a location that satisfies a goal at hand, or else, choose a location that will lead to a plan, or else, place it on the table. Tie-breaker for action selection: when actions are chosen non-deterministically, choose actions that lead to a plan, even a suboptimal plan is fine. Throwaway the actions that may lead to loops. A planning problem is given below, find a plan using the operators and predicates defined in the blocks-world domain.

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 on Y.
Pickup(X)         Pickup X from the table.
Putdown(X)        Putdown X on the table.
Unstack(X,Y)      Remove X that is directly sitting on Y.
Stack(X,Y)        Place X directly on top of Y.
```

OPERATORS

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

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

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

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

AUTOMATED PLANNING

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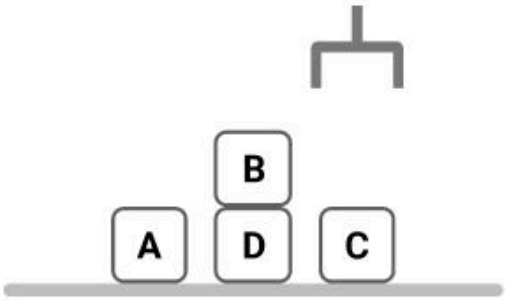
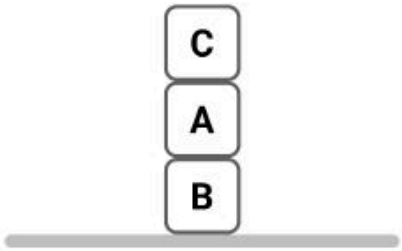
goal at hand, or else, choose a location that will lead to a plan, or else, place it on the table. Tie-breaker for action selection: when actions are chosen non-deterministically, choose actions that lead to a plan, even a suboptimal plan is fine. Throwaway the actions that may lead to loops. A planning problem is given below, find a plan using the operators and predicates defined in the blocks-world domain. Based on the above data,answer the given subquestions.

unstack(B,D)
putdown(B)
pickup(A)
stack(A,B)
pickup(C)
stack(C,A)



Start State

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



Goal Description

{ onTable(B),
on(A,B), on(C,A) }

Your score : 0

Question 11 :
640653589866

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the length of the optimal plan? Enter the number of actions in the optimal plan. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 6

Your score : 0

Discussions (0)

Question 12 :
640653589867

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are **applicable** actions in the start state for the given planning problem?

OPTIONS :

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

Your score : 0

Discussions (0)

Question 13 :
640653589868

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are **relevant** actions for the goal description in the given planning problem?

OPTIONS :

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

Your score : 0

Discussions (0)

Question 14 :
640653589869

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the given goal description, according to the subgoal ordering rule, which of the following represents the stack after the first call to PushSet in the Goal Stack Planning algorithm? In the representation below, the bottom of the stack is on the right end, marked by BOTTOM.

OPTIONS :

- ◯ { onTable(B), on(A,B), on(C,A) }; on(C,A); on(A,B); onTable(B); BOTTOM
- ◯ on(C,A); on(A,B); onTable(B); { onTable(B), on(A,B), on(C,A) }; BOTTOM
- ◯ { onTable(B), on(A,B), on(C,A) }; onTable(B); on(A,B); on(C,A); BOTTOM
- ◯ onTable(B); on(A,B); on(C,A); { onTable(B), on(A,B), on(C,A) }; BOTTOM
- ◯ { onTable(B), on(A,B), on(C,A) }; BOTTOM

Your score : 0

Discussions (0)

Question 15 :
640653589870

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : MCQ

For the given goal description, according to the subgoal ordering rule and tie-breaking rules, which of the following is the first action popped out of the stack in Goal Stack Planning?

OPTIONS :

- ◯ Pickup(C)
- ◯ Stack(C,A)
- ◯ Stack(A,B)
- ◯ Pickup(A)

Your score : 0

Discussions (0)

Question 16 :
640653589871

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the given goal description, according to the subgoal ordering rule and tie-breaking rules, does the Goal Stack Planning algorithm find an optimal plan?

OPTIONS :

- ◯ Yes
- ◯ No
- ◯ Cannot be determined

Your score : 0

Discussions (0)

Question 17 :
640653589872

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

If the subgoals in the goal description are reversed then does the Goal Stack Planning algorithm find an optimal plan?

OPTIONS :

- ◯ Yes
- ◯ No
- ◯ Cannot be determined

Your score : 0

Discussions (0)

Question 18 : 640653589848

Total Mark : 0.00 | Type : COMPREHENSION

TSP

The distance matrix for 5 cities (A to E) is provided below. From each city the distances to other cities are listed in ascending order. For example, the distance from A to C is 56, from A to D is 80, and so on.

A	→	C : 56	D : 80	B : 110	E : 118
B	→	D : 40	E : 40	C : 80	A : 110
C	→	D : 40	A : 56	B : 80	E : 106
D	→	B : 40	C : 40	E : 72	A : 80
E	→	B : 40	D : 72	C : 106	A : 118

Solve the sub-questions using the TSP Branch-and-Bound algorithm.

Attention: Infer as much as possible (and as early as possible) about the permanent edges in the partial solutions. The semantics of the permanent edges (which are bidirectional) are as discussed in the practice assignments.

Your score : 0

Question 19 : 640653589849

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the lower bound on the cost of the tours (SO) as per the TSP BnB algorithm discussed in class? Enter an integer. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 252

Your score : 0

Discussions (0)

Question 20 :
640653589850

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently included edges in the node (S0,~BD,~BE) in the TSP BnB search tree. Enter the total number of permanently included edges in the text box.

Enter an integer.
NO SPACES, TABS, DOTS, BRACKETS
OR EXTRANEOUS CHARACTERS.
Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 3

Your score : 0

Discussions (0)

Question 21 :
640653589851

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently excluded edges in the node (S0,~BD,~BE) in the TSP BnB search tree. Enter the total number of permanently excluded edges in the text box.

Enter an integer.
NO SPACES, TABS, DOTS, BRACKETS
OR EXTRANEOUS CHARACTERS.
Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 3

Your score : 0

Discussions (0)

Question 22 :
640653589852

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

How many tours are represented by the node (S0,~BD,~BE) in the TSP BnB search tree?

Enter an integer.
NO SPACES, TABS, DOTS, BRACKETS
OR EXTRANEOUS CHARACTERS.
Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 2

Your score : 0

Discussions (0)

Question 23 : 640653589853

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the estimated cost of the node (S0,~BD,~BE) in the TSP BnB search tree?

Enter an integer.
NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS.
Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 395

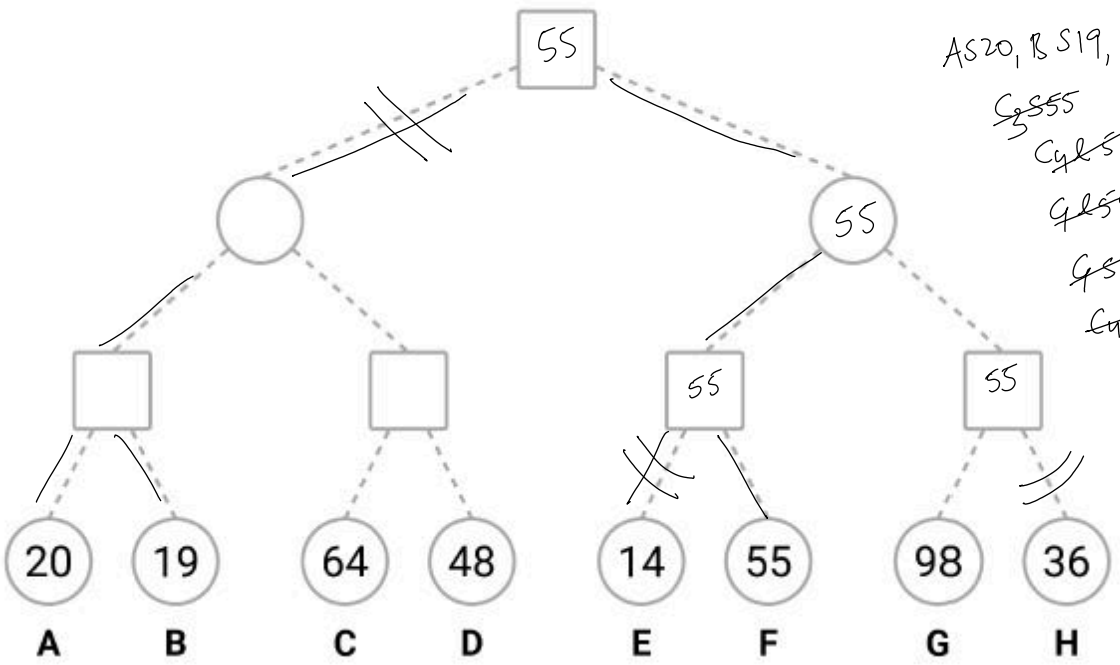
Your score : 0

Discussions (0)

Question 24 : 640653589859

Total Mark : 0.00 | Type : COMPREHENSION

Based on the above figure,answer the given subquestions.



Your score : 0

Question 25 :
640653589860

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Enter the total number of strategies that are possible for MAX. Enter an integer. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 8

Your score : 0

Discussions (0)

Question 26 :
640653589861

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : F,G

Your score : 0

Discussions (0)

Question 27 :
640653589862

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes pruned by Alpha-Beta algorithm. Enter the node labels as a comma separated list in ASCENDING order. Enter NIL if no nodes are pruned. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : D,H

Your score : 0

Discussions (0)

Question 28 :
640653589863

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes in the initial cluster formed by SSS* algorithm. Enter the node labels as a comma separated list in ASCENDING order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : A,B,E,F

Your score : 0

Discussions (0)

Question 29 : 640653589864

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes assigned SOLVED status by the SSS* algorithm. Enter the node labels as a comma separated list in ASCENDING order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : A,B,E,F,G

Your score : 0

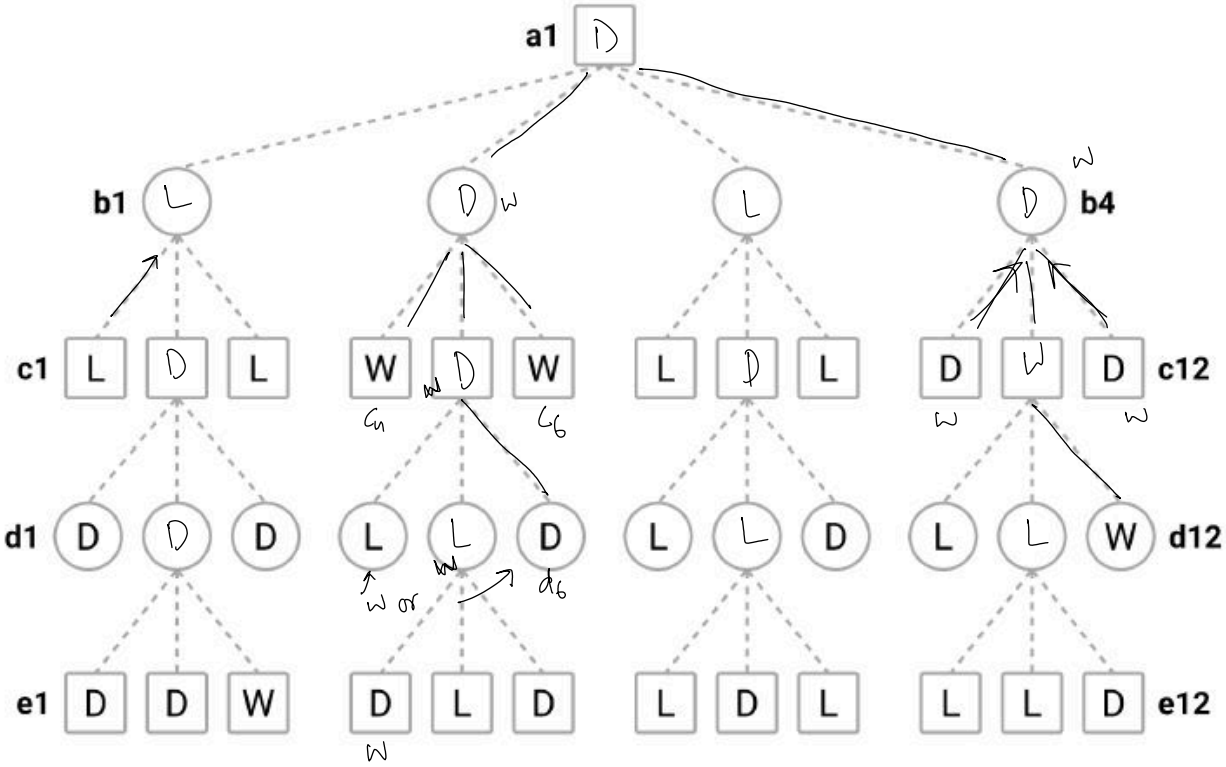
Discussions (0)

Question 30 : 640653589854

Total Mark : 0.00 | Type : COMPREHENSION

GAMES

The figure shows a game tree with evaluations W (win), L (loss) and D (draw) from MAX's perspective. The nodes are labeled in a level-by-level (a,b,...,e) left-to-right (1,2,3,...) manner as indicated in the game tree. Based on the above data,answer the given subquestions.



Your score : 0

Question 31 :
640653589855

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the outcome (W, D or L) of the game when both players play perfectly? NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X

Answer (Alphanumeric):

Answer

Accepted Answer : D

Your score : 0

Discussions (0)

Question 32 :
640653589856

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Identify the leaf nodes in the best strategy for MAX. Enter the labels of the leaf nodes as a comma separated list in ascending order (a1,b1,b2,b3,...,c1,c2,c3,...). Enter NIL if there is no best strategy for MAX. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a1,b3,c2

Answer (Alphanumeric):

Answer

Accepted Answer : c4,c6,d6

Your score : 0

Discussions (0)

Question 33 :
640653589857

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Evaluate the game tree in depth-first left-to-right order, for this evaluation order identify the don't care nodes in level c, nodes c1 to c12. Enter one of the don't care nodes and its minimax value as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: c1,X

Answer (Alphanumeric):

Answer

Accepted Answer : c2,D

Your score : 0

Discussions (0)

Question 34 :
640653589858

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Choose one leaf node and change its eval so that the game outcome changes. Which leaf node will you choose and what will be its new eval? Enter the label of the leaf node and its new eval as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a1,X

Answer (Alphanumeric):

Answer

Accepted Answer : d4,W

Your score : 0

Discussions (0)

SUBMIT EXAM