Exam : Quiz 2
Subject : AI
Total Marks : 25.00
QP : 2024 Aug04: IIT M AN EXAM QDB4

Exam Mode | Learning Mode

QUESTION MENU

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32				

TIMER

00:19

CONTROLS

SUBMIT EXAM

Your Score
0.00 / 25.00
(0%)

Question 1 : 640653857410 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 : 640653857411

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

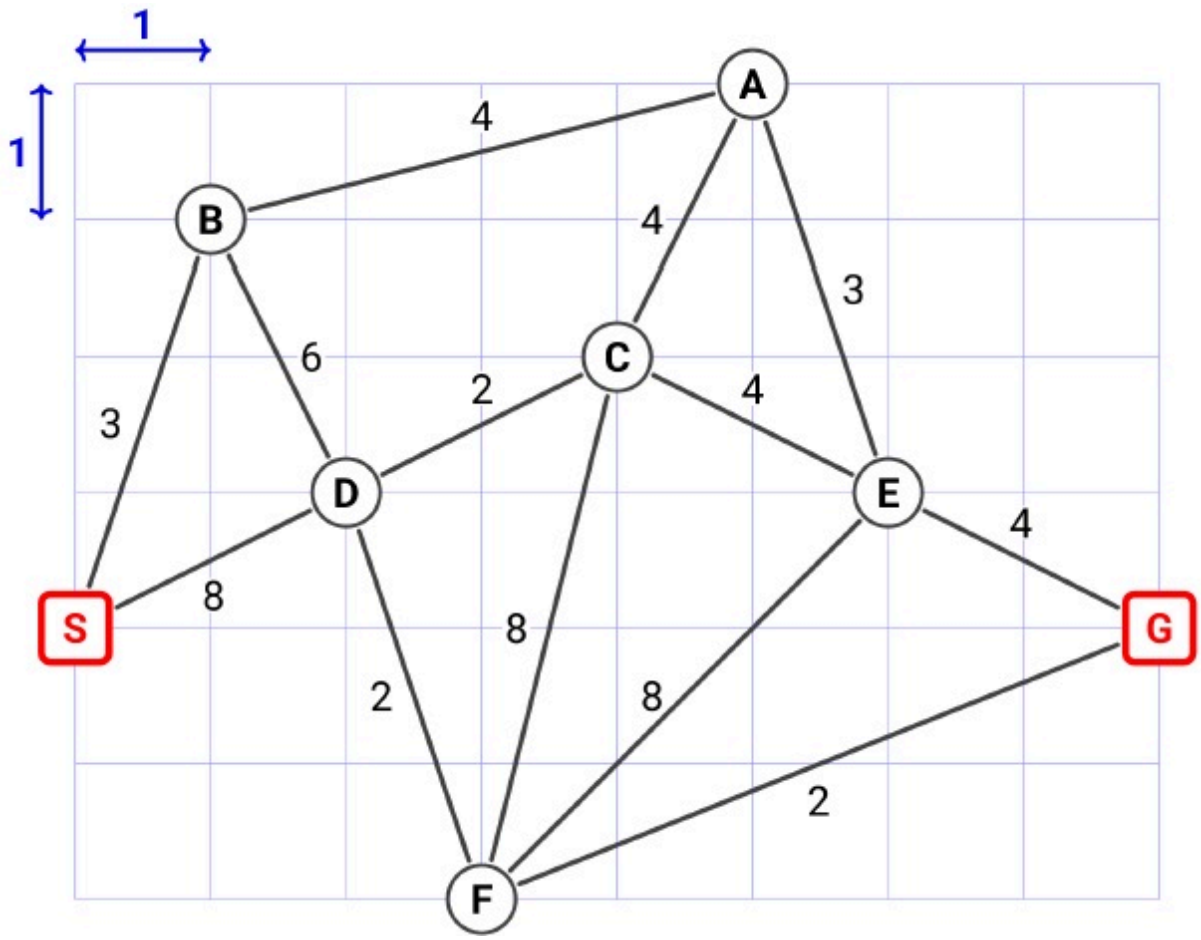
Discussions (0)

Question 3 : 640653857412

Total Mark : 0.00 | Type : COMPREHENSION

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 subquestions.



Your score : 0

Question 4 :
640653857413

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

In the map, S is the first node to be refined, determine the next 3 nodes (from the 2nd to 4th node) refined by A*. Enter the nodes in the order they are refined. 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,E

Your score : 0

Discussions (0)

Question 5 :
640653857414

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 3 nodes from the 2nd to 4th node refined by A*, 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 : 13,14,13

Your score : 0

Discussions (0)

Question 6 :
640653857415

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 3 nodes from the 2nd to 4th node refined by A*, 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,B,A

Your score : 0

Discussions (0)

Question 7 :
640653857416

View Parent QN | View Solutions (0)

Total Mark : 1.00 | 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,G

Answer (Alphanumeric):

Answer

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

Your score : 0

Discussions (0)

Question 8 :
640653857417

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,D,C,E,G

Your score : 0

Discussions (0)

Question 9 :
640653857418

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? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS.

Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 12

Your score : 0

Discussions (0)

Question 10 : 640653857419

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 11 : 640653857420

Total Mark : 0.00 | Type : COMPREHENSION

The distance matrix for 6 cities are provided below. For each city the distances to other cities are listed in ascending order. For example, the distance from A to D is 42, and from A to F is 48, and so on. 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 segments in the partial solutions. A segment is a two-way edge between two cities.

A	D:42	F:48	E:64	C:86	B:96
B	C:72	F:88	A:96	D:104	E:144
C	D:62	B:72	A:86	F:114	E:150
D	A:42	C:62	F:86	E:100	B:104
E	F:58	A:64	D:100	B:144	C:150
F	A:48	E:58	D:86	B:88	C:114

Your score : 0

Question 12 :
640653857421

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 a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 358

Your score : 0

Discussions (0)

Question 13 :
640653857422

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently included segments in the node (S0,AD,~AF,EF,CD,~AE) in the TSP BnB search tree. Enter the total number of permanently included segments in the text box. Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 4

Your score : 0

Discussions (0)

Question 14 :
640653857423

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently excluded segments in the node (S0,AD,~AF,EF,CD,~AE) in the TSP BnB search tree. Enter the total number of permanently excluded segments in the text box. Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 7

Your score : 0

Discussions (0)

Question 15 :
640653857424

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

How many tours are represented by the node (S0,AD,~AF,EF,CD,~AE) in the TSP BnB search tree? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 2

Your score : 0

Discussions (0)

Question 16 : 640653857425

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the node (S0,AD,~AF,EF,CD,~AE) in the TSP BnB search tree? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17.3

Answer (Numeric):

Answer

Accepted Answer : 475

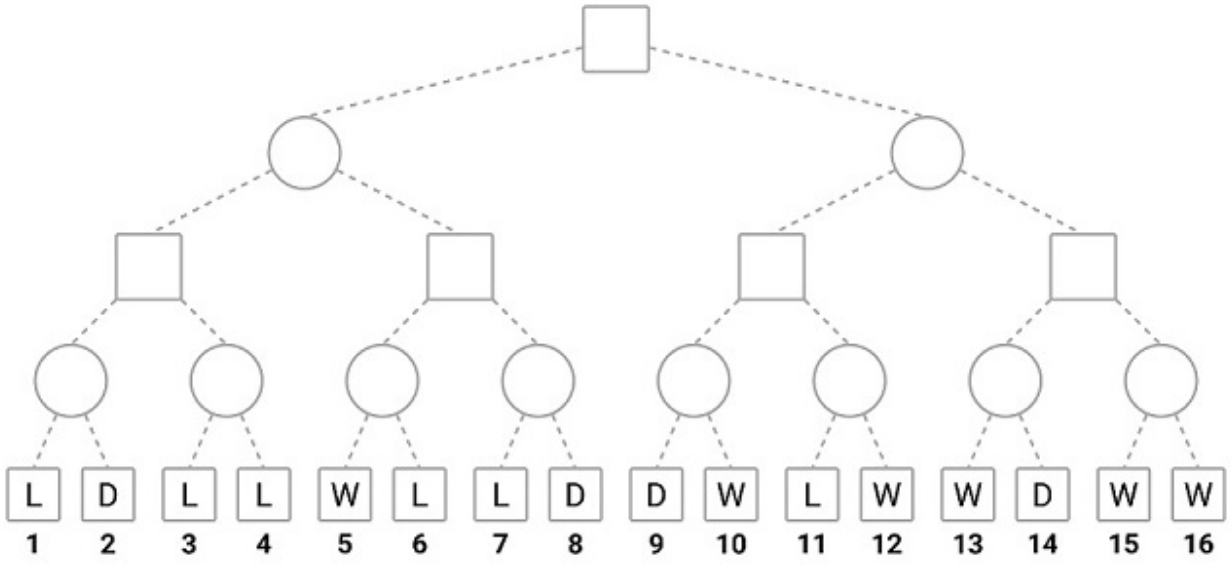
Your score : 0

Discussions (0)

Question 17 : 640653857426

Total Mark : 0.00 | Type : COMPREHENSION

The figure shows a game tree with evaluations W (win), D (draw) and L (loss) from Max's perspective. The horizon nodes carry evals (W/D/L) and node labels (1 to 16). Based on the above data, answer the given subquestions.



Your score : 0

Question 18 :
640653857427

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 19 :
640653857428

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Change the value of only one horizon node such that the outcome of the game changes. Which horizon node will you change and what will be its new value? Enter

the label of the horizon node and the new value as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 16,X

Answer (Alphanumeric):

Answer

Accepted Answer : 9,W

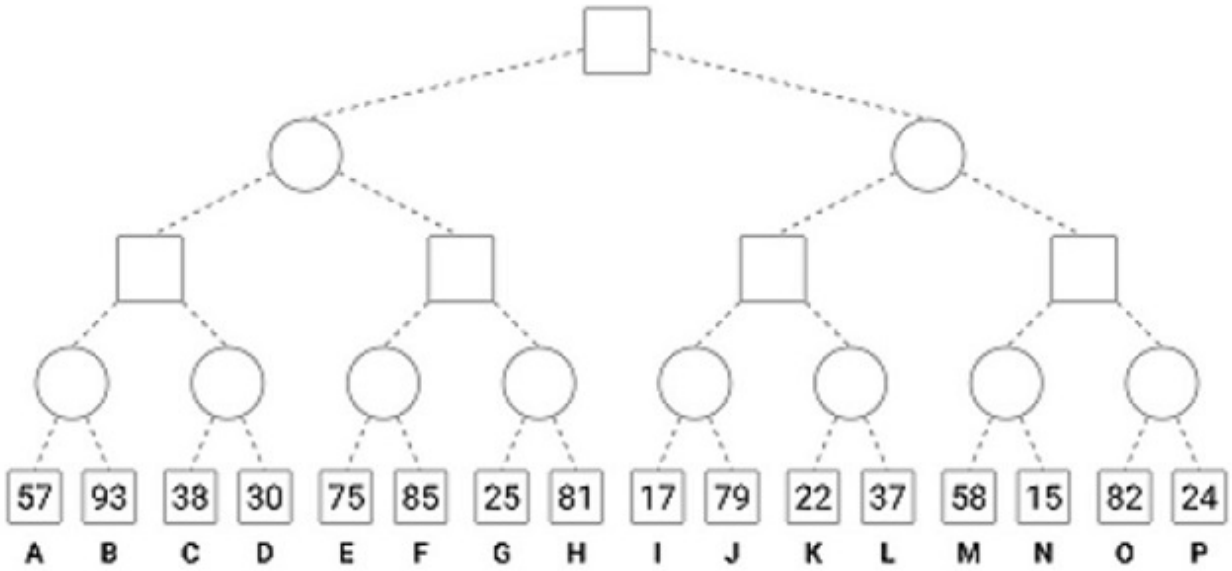
Your score : 0

Discussions (0)

Question 20 : 640653857429

Total Mark : 0.00 | Type : COMPREHENSION

The figure shows a game tree with evaluations at the horizon from Max's perspective. The horizon nodes carry evals (numbers) and node labels (A to P). Based on the above data, answer the given subquestions.



Your score : 0

Question 21 :
640653857430

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes in the best strategy. Enter the node labels. 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 22 :
640653857431

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. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : D,G,H,J,K,M,N,O,P

Your score : 0

Discussions (0)

Question 23 :
640653857432

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,C,I,K

Your score : 0

Discussions (0)

Question 24 : 640653857433

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 done

Accepted Answer : A,B,C,E,F,I,K

Your score : 0

Discussions (0)

Question 25 : 640653857434

Total Mark : 0.00 | Type : COMPREHENSION

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. Tie-breaker: When actions are chosen non-deterministically, choose actions that lead to a plan. Throw away the actions that lead to deadends and cycles. Tie-breaker: Treat the goal description, preconditions and effects as lists that are accessed from left to right. When the elements in a list are pushed one by one to a stack, the last element in the list will be at the top of the stack. It has the effect of reversing the list. A planning problem is given below, find a plan using the operators and predicates defined in the blocks-world domain.

PREDICATES

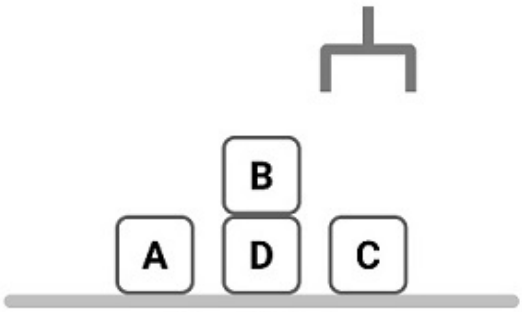
```
armEmpty    The arm is not holding any block, it is empty.
holding(X)  The arm is holding X.
onTable(X)  X is on the table.
clear(X)    X has nothing above it, it is clear.
on(X,Y)     X is directly on Y.
```

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) }
```

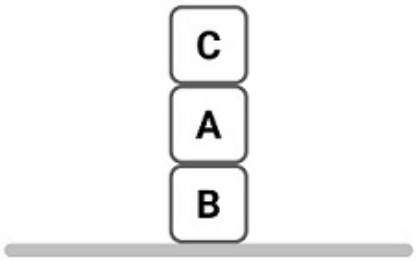
The domain description of a blocks-world with a single one-armed robot is provided below. Note: this is the same domain description used in the weekly assignments. Tie-breaker: When actions are chosen non-deterministically, choose actions that lead to a plan. Throw away the actions that lead to deadends and cycles. Tie-breaker: Treat the goal description, preconditions and effects as lists that are accessed from left to right. When the elements in a list are pushed one by one to a stack, the last element in the list will be at the top of the stack. It has the effect of reversing the list. 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.



Start State

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



Goal Description

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

Your score : 0

Question 26 :
640653857435

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 27 :
640653857436

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

Your score : 0

Discussions (0)

Question 28 :
640653857437

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

Your score : 0

Discussions (0)

Question 29 :
640653857438

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the subgoal ordering given in the goal description (and using the given tie breaking rules) which of the following can be pushed as the first four elements onto the stack by the Goal Stack Planning algorithm? In the representation below, the bottom of the stack is on the right end, marked by BOTTOM.

OPTIONS :

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

Your score : 0

Discussions (0)

Question 30 :
640653857439

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the subgoal ordering given in the goal description (and using the given tie breaking rules), which of the following is the first action popped out of the stack in Goal Stack Planning?

OPTIONS :

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

Your score : 0

Discussions (0)

Question 31 :
640653857440

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the subgoal ordering given in the goal description (and using the given 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 32 :
640653857441

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

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

OPTIONS :

- ◯ Yes
- ◯ No
- ◯ Cannot be determined

Your score : 0

Discussions (0)

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