Exam : Quiz 2
Subject : AI
Total Marks : 25.00
QP : 2023 Apr2: IIT M DEGREE AN2 EXAM QPE2

Exam Mode | Learning Mode

View Question Paper Summary

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					

TIMER

00:09

CONTROLS

SUBMIT EXAM

Your Score
0.00 / 25.00
(0%)

Question 1 : 640653521858 Total Mark : 0.00 | Type : MCQ

THIS IS QUESTION PAPER FOR THE SUBJECT **"DEGREE LEVEL : AI: SEARCH METHODS FOR** PROBLEM SOLVING" 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

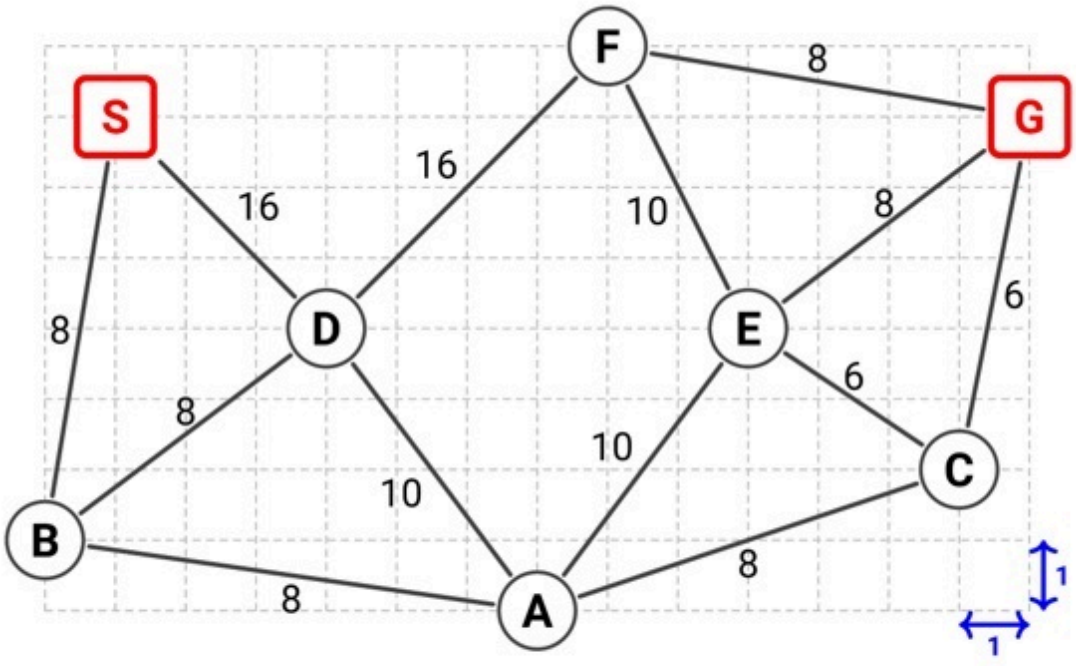
Discussions (0)

Question 2 : 640653521859

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 :
640653521860

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 4 nodes (from the 2nd to 5th 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,D,A,C

Your score : 0

Discussions (0)

Question 4 :
640653521861

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 : 28,29,30,30

Your score : 0

Discussions (0)

Question 5 :
640653521862

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,A

Your score : 0

Discussions (0)

Question 6 :
640653521863

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,Z,G

Answer (Alphanumeric):

Answer

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

Your score : 0

Discussions (0)

Question 7 :
640653521864

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,F,G

Your score : 0

Discussions (0)

Question 8 :
640653521865

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: 17

Answer (Numeric):

Answer

Accepted Answer : 30

Your score : 0

Discussions (0)

Question 9 :
640653521866

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 : 640653521867

Total Mark : 0.00 | Type : COMPREHENSION

TSP

The distance matrix and sorted edge costs for 7 cities (A to G) are provided below. Note: sorted edge costs are derived from distance matrix. Solve the given subquestions 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.

	A	B	C	D	E	F	G
A	-	57	82	53	32	27	47
B	57	-	81	69	96	45	94
C	82	81	-	32	71	42	17
D	53	69	32	-	16	17	55
E	32	96	71	16	-	60	63
F	27	45	42	17	60	-	75
G	47	94	17	55	63	75	-

16 DE	45 BF	69 BD
17 CG	47 AG	71 CE
17 DF	53 AD	75 FG
27 AF	55 DG	81 BC
32 AE	57 AB	82 AC
32 CD	60 EF	94 BG
42 CF	63 EG	96 BE

Your score : 0

Question 11 :
640653521868

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the lower bound on the cost of the tours (S0) as per the TSP BnB algorithm discussed in class? Enter a real number, round it to one decimal place. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17.3

Answer (Numeric):

Answer

Accepted Answer : 199.5

Your score : 0

Discussions (0)

Question 12 :
640653521869

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently included edges in the node (AF,CG,DE,DF) in the TSP BnB search tree. Enter the total number of permanently included edges in the text box. Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 4

Your score : 0

Discussions (0)

Question 13 :
640653521870

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Infer all the permanently excluded edges in the node (AF,CG,DE,DF) in the TSP BnB search tree. Enter the total number of permanently excluded edges in the text box. Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 7

Your score : 0

Discussions (0)

Question 14 :
640653521871

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

How many tours are represented by the node (AF,CG,DE,DF) 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 : 4

Your score : 0

Discussions (0)

Question 15 :
640653521872

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the estimated cost of the node (AF,CG,DE,DF) 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 : 260

Your score : 0

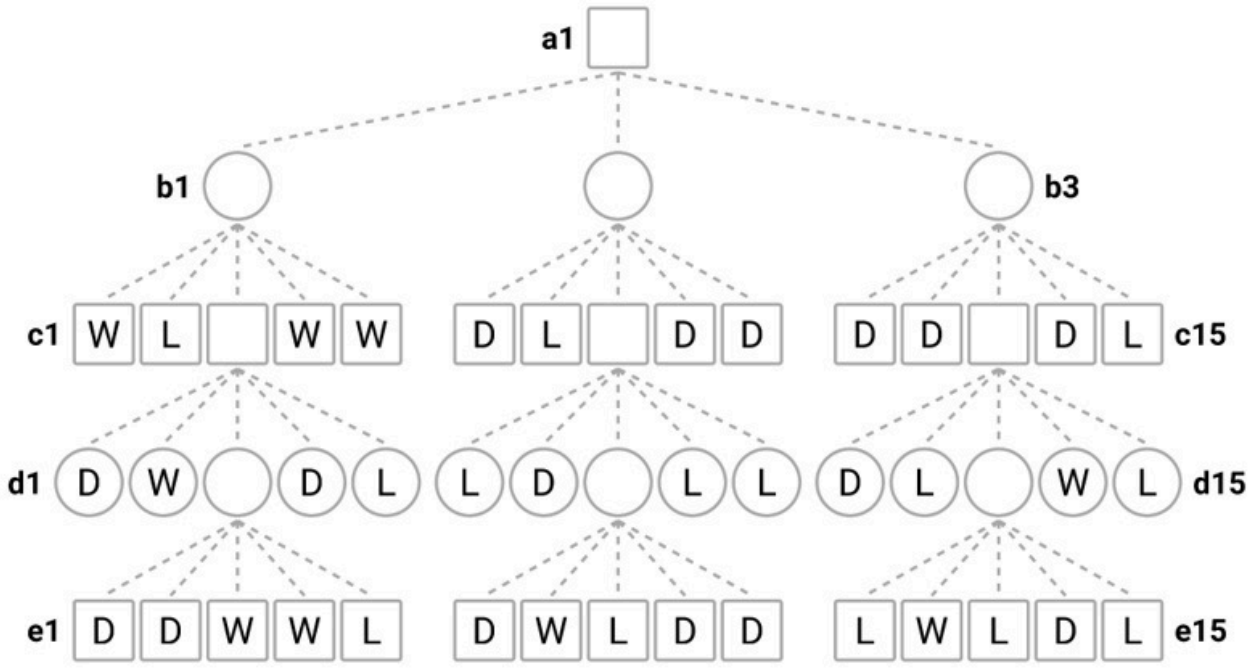
Discussions (0)

Question 16 : 640653521873

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,...) manner as indicated in the game tree. Based on the above data, answer the given subquestions.



Your score : 0

Question 17 : 640653521874

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 : L

Your score : 0

Discussions (0)

Question 18 : 640653521875

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Evaluation order matters. Evaluate the game tree in depth-first-search order (depth-first left-to-right order), for this evaluation order identify the “don’t care” nodes in level c, nodes c1 to c15. Enter one of the “don’t care” nodes and its value as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a1,X

Answer (Alphanumeric):

Answer

Accepted Answer : c3,L

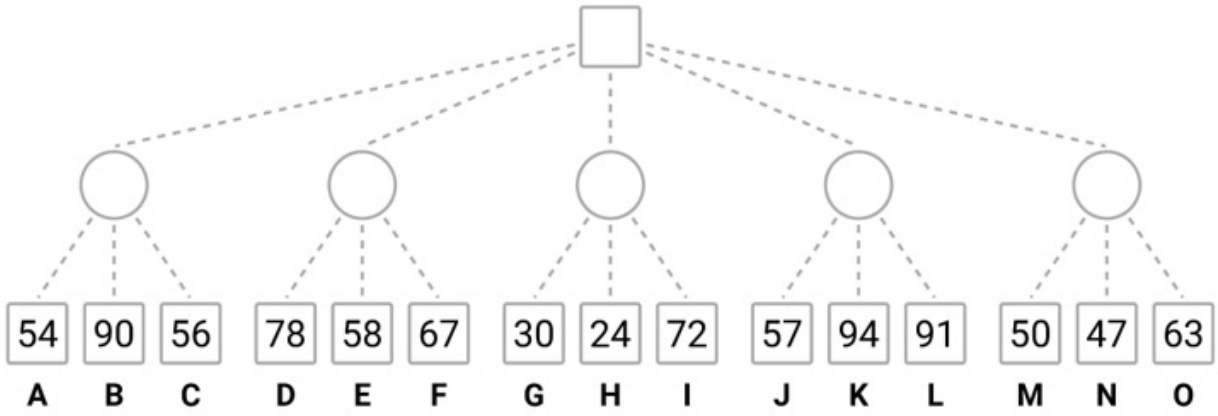
Your score : 0

Discussions (0)

Question 19 : 640653521876

Total Mark : 0.00 | Type : COMPREHENSION

Based on the above data, answer the given subquestions.



Your score : 0

Question 20 :
640653521877

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes in the best strategy. 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,E,F

Your score : 0

Discussions (0)

Question 21 :
640653521878

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 : H,I,K,L,N,O

Your score : 0

Discussions (0)

Question 22 :
640653521879

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,D,G,J,M

Your score : 0

Discussions (0)

Question 23 :
640653521880

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,D,E,F,G,J,M

Your score : 0

Discussions (0)

Question 24 : 640653521881

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. Tie-breaker for subgoal ordering: treat the start state, 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 into a stack, the last element 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, choose the 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.
```

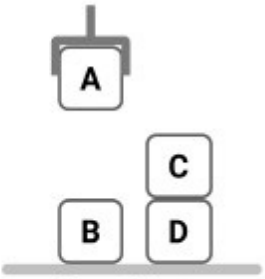
OPERATORS

```
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

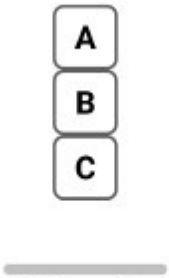
The domain description of a blocks-world with a single one-armed robot is provided below. Note: this is the same domain description used in the weekly assignments. Tie-breaker for subgoal ordering: treat the start state, goal description, preconditions and effects as lists that are accessed from left to right. When the elements in a list are pushed one by one into a stack, the last element 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, choose the 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. Based on the above data, answer the given subquestions.



Start State

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



Goal Description

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

Your score : 0

Question 25 :
640653521882

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 : 5

Your score : 0

Discussions (0)

Question 26 :
640653521883

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

Your score : 0

Discussions (0)

Question 27 :
640653521884

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

Your score : 0

Discussions (0)

Question 28 :
640653521885

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 three 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 END.

OPTIONS :

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

Your score : 0

Discussions (0)

Question 29 :
640653521886

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(A)
- ◯ Stack(A,B)
- ◯ Stack(B,C)
- ◯ Unstack(C,D)

Your score : 0

Discussions (0)

Question 30 :
640653521887

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 31 :
640653521888

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

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

OPTIONS :

- ◯ Yes
- ◯ No
- ◯ Cannot be determined

Your score : 0

Discussions (0)

SUBMIT EXAM