Assignment 7

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

BEGIN GROUP

1) In the Alpha-Beta algorithm, list the line numbers where alpha-cutoff and beta-cutoff occur, respectively.

   \texttt{ALPHA-BETA(N, \alpha, \beta)}
   \begin{align*}
   &1 \text{ if } N \text{ is a terminal node} \\
   &2 \quad \text{return } eval(N) \\
   &3 \text{ if } N \text{ is a MAX node} \\
   &4 \quad \text{for each child } C \text{ of } N \\
   &5 \quad \quad \alpha \leftarrow \max(\alpha, \text{ALPHA-BETA}(C, \alpha, \beta)) \\
   &6 \quad \text{if } \alpha \geq \beta \text{ then return } \beta \\
   &7 \quad \text{return } \alpha \\
   &8 \text{ else } N \text{ is a MIN node} \\
   &9 \quad \text{for each child } C \text{ of } N \\
   &10 \quad \quad \beta \leftarrow \min(\beta, \text{ALPHA-BETA}(C, \alpha, \beta)) \\
   &11 \quad \text{if } \alpha \geq \beta \text{ then return } \alpha \\
   &12 \quad \text{return } \beta
   \end{align*}

Enter the line numbers as a comma separated list. Enter the line number of alpha-cutoff first then beta-cutoff. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 11,6
(Type: String) 11,6

2) In the SSS* algorithm, list the line numbers where node pruning occurs.

https://onlinecourses.nptel.ac.in/noc20_cs81/unit?unit=39&assessment=198
A strategy in a two player game tree is a subtree that is chosen as below:

- Starting from the root, pick all moves for MAX and pick one move for MIN
- Starting from the root, pick one move for MAX and pick all moves for MIN
- Starting from the root, pick one move for MAX and one move for MIN
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 21

Consider a two player 4-ply game tree with a branching factor of 3 that starts with a MAX node. What is the total number of strategies in this game tree?

Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 81

The figure shows a game tree with evaluations W (win), L (loss) and D (draw) from Max's perspective. In this game tree the labels P, Q, R, S indicate strategies/moves.
5) What is the outcome (W, L or D) of the game when both players play perfectly?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) W

6) Which of the moves P, Q, R, S are best moves for Max?

Enter a comma separated list of moves in ALPHABETICAL order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) R

7) Which of the moves P, Q, R, S would be best for Min?

Enter a comma separated list of moves in ALPHABETICAL order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) Q

8) Which of the moves P, Q, R, S lead to a draw if both play perfectly after that?

Enter a comma separated list of moves in ALPHABETICAL order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) P, S

END GROUP

BEGIN GROUP

The figure shows a 4-ply game tree with evaluation function values at the horizon. The nodes in the horizon carry reference numbers (sequence numbers going left to right) at the bottom. Use these reference numbers when you want to enter a list of nodes. Where necessary assume top-down and left-to-right node order. Use this game tree to answer the following questions.
9) What is the MinMax value of the game?

Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 10

1 point

10) List the nodes (node reference numbers) in the best strategy.

Enter the reference numbers as a comma separated list in ASCENDING order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 3,4,7,8,11,12
(Type: String) 3, 4, 7, 8, 11, 12

1 point

11) Simulate AlphaBeta algorithm on Game Tree 1. What is the number of alpha-cuts and the number of beta-cuts induced by the AlphaBeta algorithm?

Note: a single cut may prune away multiple branches or multiple leaves, but it is still a single cut.

List the number of cuts as a comma separated list. Alpha-cuts followed by beta-cuts. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 3,2
(Type: String) 3, 2

1 point

12) How many nodes are pruned (unexplored) by AlphaBeta algorithm? Count only the horizon nodes.

Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 14

1 point

13) List the nodes pruned by alpha-cuts. Count only the horizon nodes.

Enter the reference numbers of the nodes pruned by alpha cuts as a comma separated list in ASCENDING order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 14,16,17,18,19,20,21,22,23,24
(Type: String) 14, 16, 17, 18, 19, 20, 21, 22, 23, 24

1 point

14) List the nodes pruned by beta-cuts. Count only the horizon nodes.
Enter the reference numbers of the nodes pruned by beta cuts as a comma separated list in ASCENDING order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 7,8,11,12
(Type: String) 7, 8, 11, 12

15) What is the total number of strategies in Game Tree 1?
Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 16

16) In Game Tree 1, what is the number of initial clusters formed by SSS*?
Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 4

17) List the horizon nodes in the initial clusters formed by SSS*?
Enter the reference numbers of the nodes in the initial cluster as a comma separated list in ASCENDING order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 1,3,13,15
(Type: String) 1, 3, 13, 15

18) Simulate SSS* algorithm on Game Tree 1. When h-values are equal then select the leftmost deeper node in the tree to break the tie. What is the total number of horizon nodes moved to SOLVED status by SSS*?
Enter a natural number. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 10

19) What are the first 7 horizon nodes that are assigned SOLVED status by SSS*? When h-values are equal then select the leftmost deeper node in the tree to break the tie.
Enter the node reference numbers as a comma separated list in ASCENDING order. DO NOT enter extraneous characters like spaces, dots, brackets, extra commas, etc.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) 1,2,3,4,5,13,15
(Type: String) 1,3,13,15,2,4,5
(Type: String) 1,2,3,4,5,13,15
(Type: String) 1, 3, 13, 15, 2, 4, 5

20) A second game tree is shown below. Run Minimax and AlphaBeta on this game tree.
What can you say about Game Tree 1 and Game Tree 2? Select all the correct options.

- Each tree represents a different game
- The possible games played in the two trees are the same
- The MinMax values are the same
- The MinMax values are different
- The amount of pruning done by AlphaBeta algorithm is the same in both game trees

No, the answer is incorrect.

Score: 0

Accepted Answers:
The possible games played in the two trees are the same
The MinMax values are the same

END GROUP