K.G.C.E.
Karjat - Raigad

Page No. :
Date :

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CLASS : B.E. IT

ROLL NO. 49

SUBJECT : IS lab

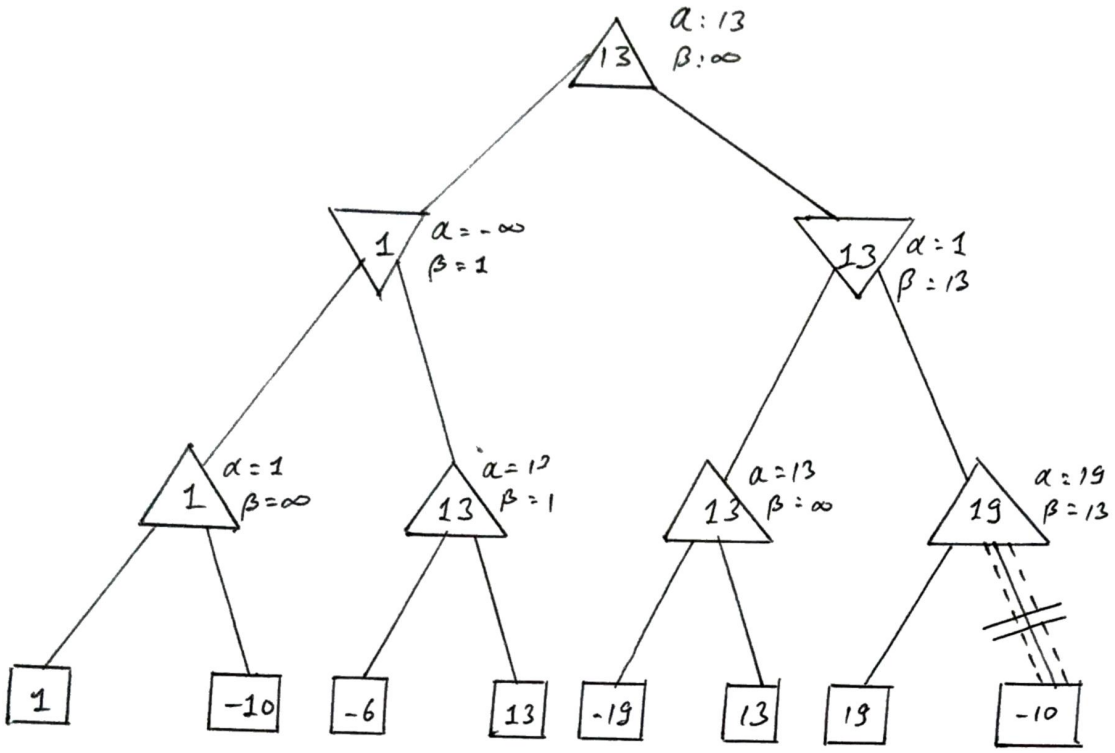
DOP	DOC	MARKS	SIGN

* Alpha Beta Pruning

→ Alpha-Beta pruning is a search algorithm that seeks to decrease the number of nodes that are evaluated by the minimax algorithm in the search tree.
→ Alpha is the best value that the maximizer currently can guarantee at that level or above.
→ Beta is the value that the minimizer currently can guarantee at that level or above.

Rules and conditions

→ The max player will only update the value of alpha.
→ The min player will only update the value of beta.
→ We will only pass the alpha, beta values to the child nodes.
→ Node values will be passed to upper nodes instead of values of alpha and beta
→ Condition to prune : $a \geq b$ or $b \leq a$
→ ~~When alpha~~


13
α : 13
β : ∞
1
α = -∞
β = 1
13
α = 1
β = 13
1
α = 1
β = ∞
13
α = 1
β = 1
13
α = 13
β = ∞
19
α = 19
β = 13
1
-10
-6
13
-19
13
19
-10

Max nodes at depth level 2

1. $\alpha(-\infty, 1) = 1$
   $\alpha(-\infty, -10) = -10$
   $\alpha(1, -10) = 1$

2. $\beta(\infty, 1) = 1$

3. $\alpha(-\infty, -6) = -6$
   $\alpha(-\infty, 13) = 13$
   $\alpha(-6, 13) = 13$

4. $\alpha(1, 13)$

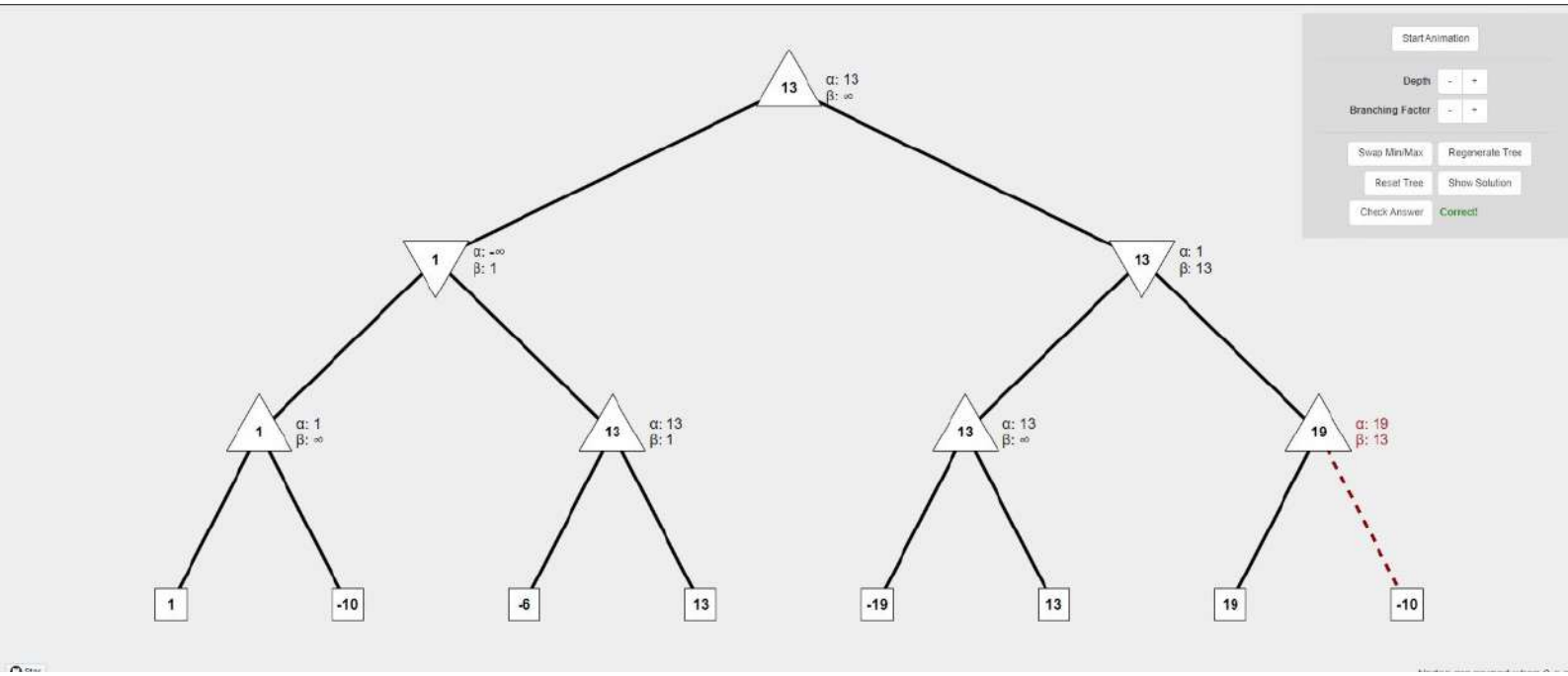
5. $\alpha(-\infty, -19) = -19$
   $\alpha(-\infty, 13) = 13$
   $\alpha(-19, 13) = 13$

6. $\alpha = 19 \quad \beta = 13$
   $\because \alpha > \beta$ the next child is pruned.

7. Min nodes
7. $\alpha = -\infty \quad \beta = 1$
   β becomes 1 here as it is a min node and gets the value from the max node below.

8. $\alpha = 1 \quad \beta = 13$
   β becomes 13 as it is a min node and gets the value from the max node below.

9. Max node (top): $\alpha = 13, \beta = \infty$


Start Animation
Depth - +
Branching Factor - +
Swap Min/Max
Regenerate Tree
Reset Tree
Show Solution
Check Answer
Correct!
13
α: 13
β: ∞
1
α: -∞
β: 1
13
α: 1
β: 13
1
α: 1
β: ∞
13
α: 13
β: 1
13
α: 13
β: ∞
19
α: 19
β: 13
1
-10
-6
13
-19
13
19
-10