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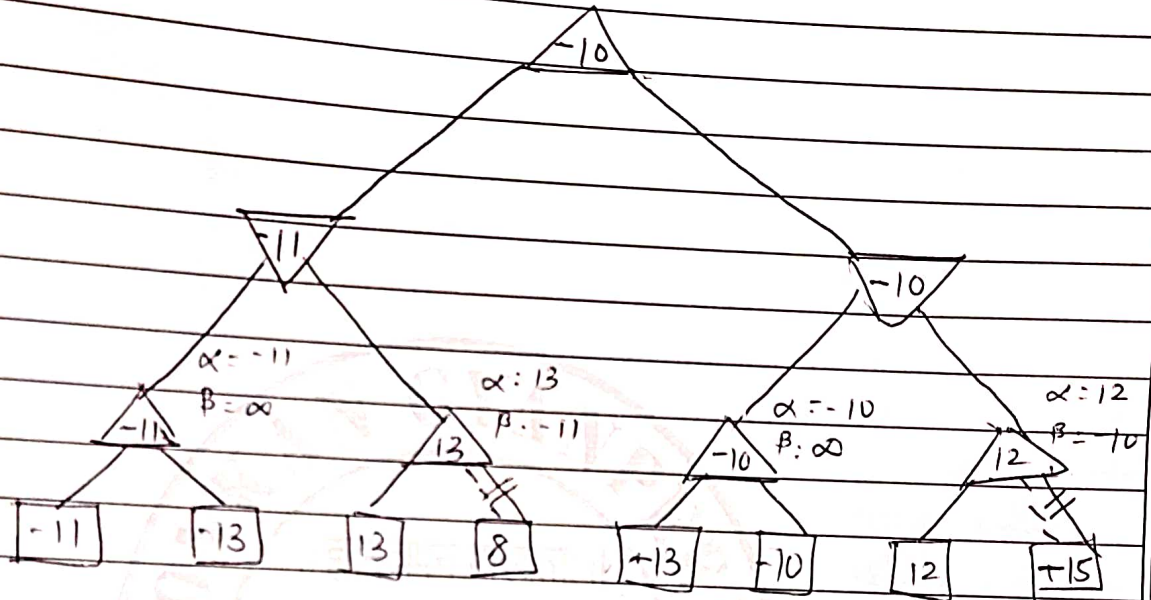
Subject : IS Lab.

DOP	DOA	Remark	Sign.

→ Alpha - Beta Pruning.

Alpha Beta Pruning :- Alpha-beta pruning is a modified version of the min-max algorithm. It is an optimization technique for the minimax algo.

- Alpha (α) : The best (highest value)
: Initial value of alpha is $-\infty$.
- Beta (β) : The best (highest value)
: Initial value is Beta is $+\infty$
- Rules and conditions :
 - 1) The max player will only update the value of alpha.
 - 2) The min player will only update the value of Beta.
 - 3) We will only pass the alpha, beta values to the child nodes.
 - 4) Node values will be passed to upper nodes instead of values of alpha and beta.
- Condition to prune : $a \geq b$ as $b \leq a$
- When alpha is greater than or equal to beta.



$$1) \alpha(-\infty, -11) = -11$$

$$\alpha(-\infty, -13) = -13$$

$$\alpha(-11, -13) = -11$$

- Max (Bottom left)

$$2) \beta(\infty, -11) = -11$$

- Min (left).

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

$$\alpha(-\infty, 8) = 8$$

$$\alpha(13, 8) = 13$$

$$\alpha = 13, \beta = -11$$

- Max (Bottom left)

$$4) \beta(-11, 13) = 13 \text{ As, } \alpha > \beta,$$

so the next node is pruned.

$$4) \alpha(-\infty, -13) = -13$$

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

$$\alpha(-13, -10) = -10$$

- Max (bottom right).

$$5) \alpha(-\infty, 12) = 12$$

$$\alpha(-\infty, -15) = -15$$

$$\alpha = 12, \quad \beta = -10$$

As $\alpha \geq \beta$, the next node is pruned.

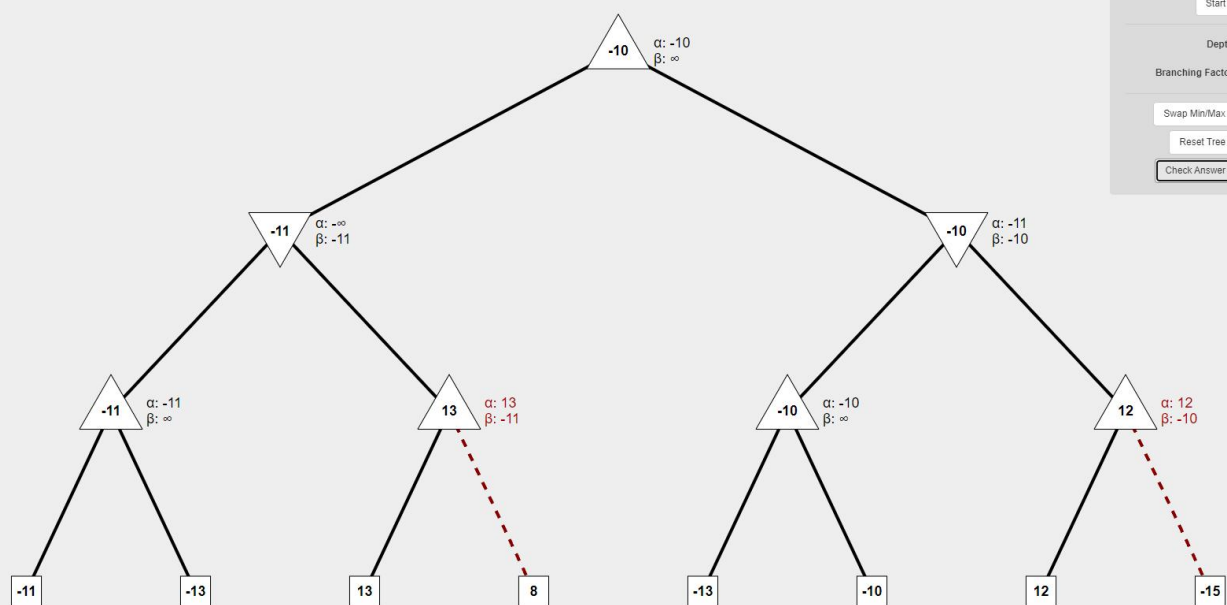
$$6) \beta(-11, 13) = -11 \quad - \text{Min}$$

$$7) \beta(-10, 12) = -10 \quad - \text{Min}$$

$$8) \alpha(-10, \infty) = -10$$

$$\alpha(-11, -10) = -10$$

~~Max~~
solution (Max)



Start Animation

Depth - +

Branching Factor - +

Swap Min/Max Regenerate Tree

Reset Tree Show Solution

Check Answer Correct!