Alpha - Beta Pruning

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Subject :- AI / ISLAB

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 min-max algorithm.

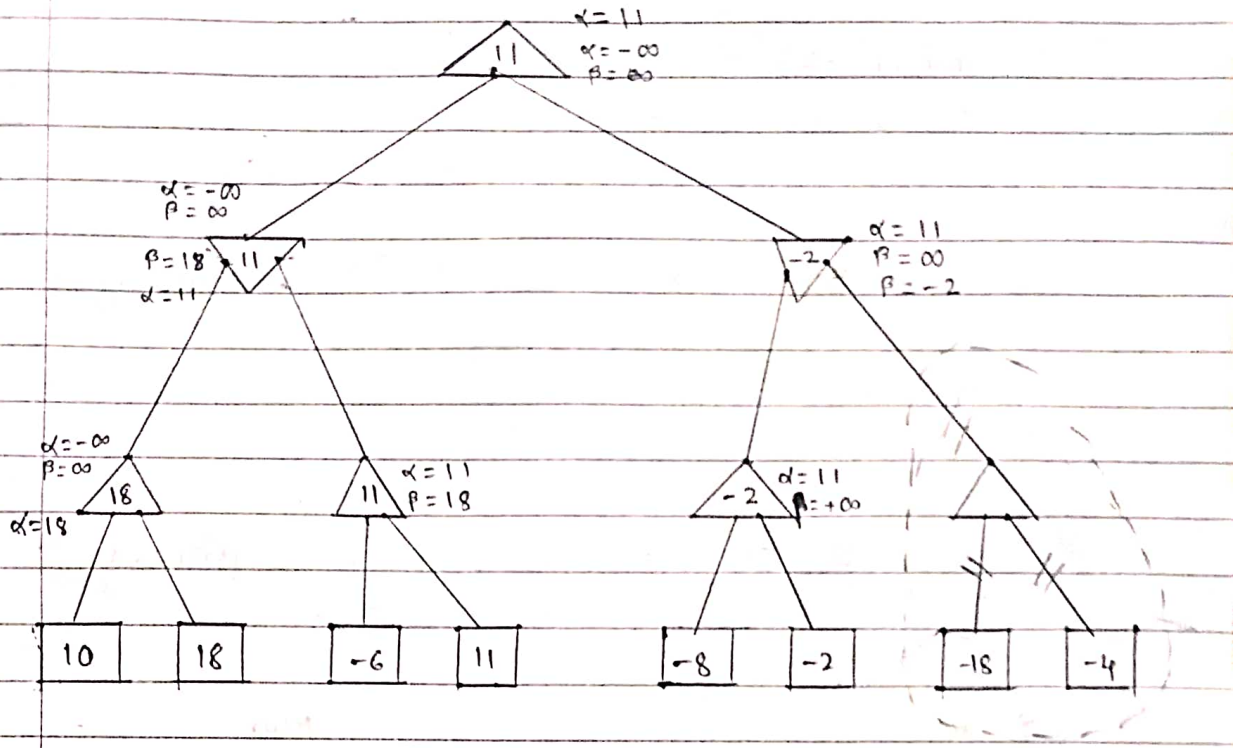
Alpha (α) = The best (high value)
= Initial value of alpha is $-\infty$

Beta (β) = The best (highest value)
= Initial value is Beta is $+\infty$

* Rules & conditions
① The max player will only update the value of alpha.
② The min player will only update the value of β.
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 & beta.

- Condition to prune : $a \geq b$ or $b \leq a$

- when alpha is greater than or equal to beta.



① $\alpha(-\infty, 10) = 10$

$\alpha(-\infty, 18) = 18$

$\alpha(10, 18) = 18$

② $\beta(\infty, 18) = 18$

③ $\alpha(-\infty, -6) = -6$

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

$\alpha(-6, 11) = 11$

④ $\alpha(11, -2)$

⑤ $\beta(18, 11) = 11$

⑥ $\beta(\infty, -2) = -2$

⑦ $\alpha(11, -8) = 11$

$\alpha(11, -2) = 11$

$\alpha(-8, -2) = -2$

⑧ $\beta(\infty, -8) = -8$ ∴ Min (right)

$\alpha = 11$

$\beta = -2$

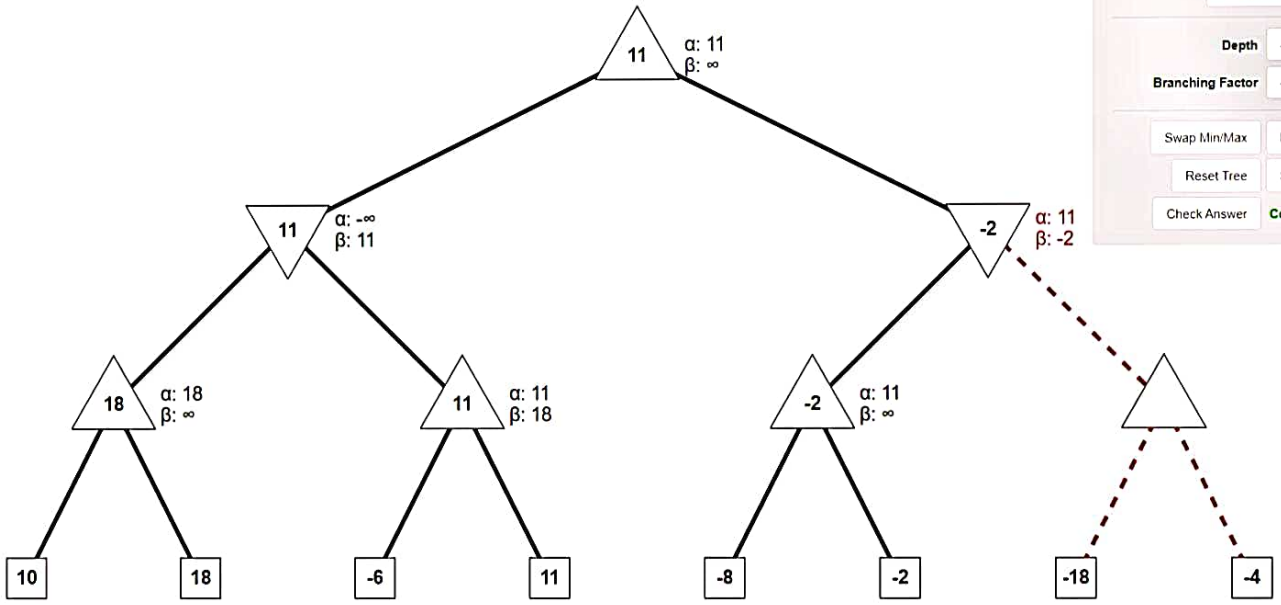
$\alpha \geq \beta$. So the next node is pruned.

⑨ $\alpha = 11$ - Max

$\beta = \infty$

$\alpha(11, -2) = 11$

The answer is ∴ $\alpha(11, -2) = 11$.



Start Animation

Depth - +

Branching Factor - +

Swap Min/Max | Regenerate Tree

Reset Tree | Show Solution

Check Answer | Correct!

Star

Nodes are pruned when β ≤ α