

Name :- Bhanesh Panchal

Class - BE I.T

Roll no - 42.

Subject - ISLAB

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Alpha-Beta Pruning:-

- Alpha beta pruning - Alpha beta pruning is a modified version of the min-max algo, it is an optimization technique for min max algo.

Alpha (α) - The first (highest) value

- Initial value of alpha is $-\infty$

Beta (β) - The first (lowest) value

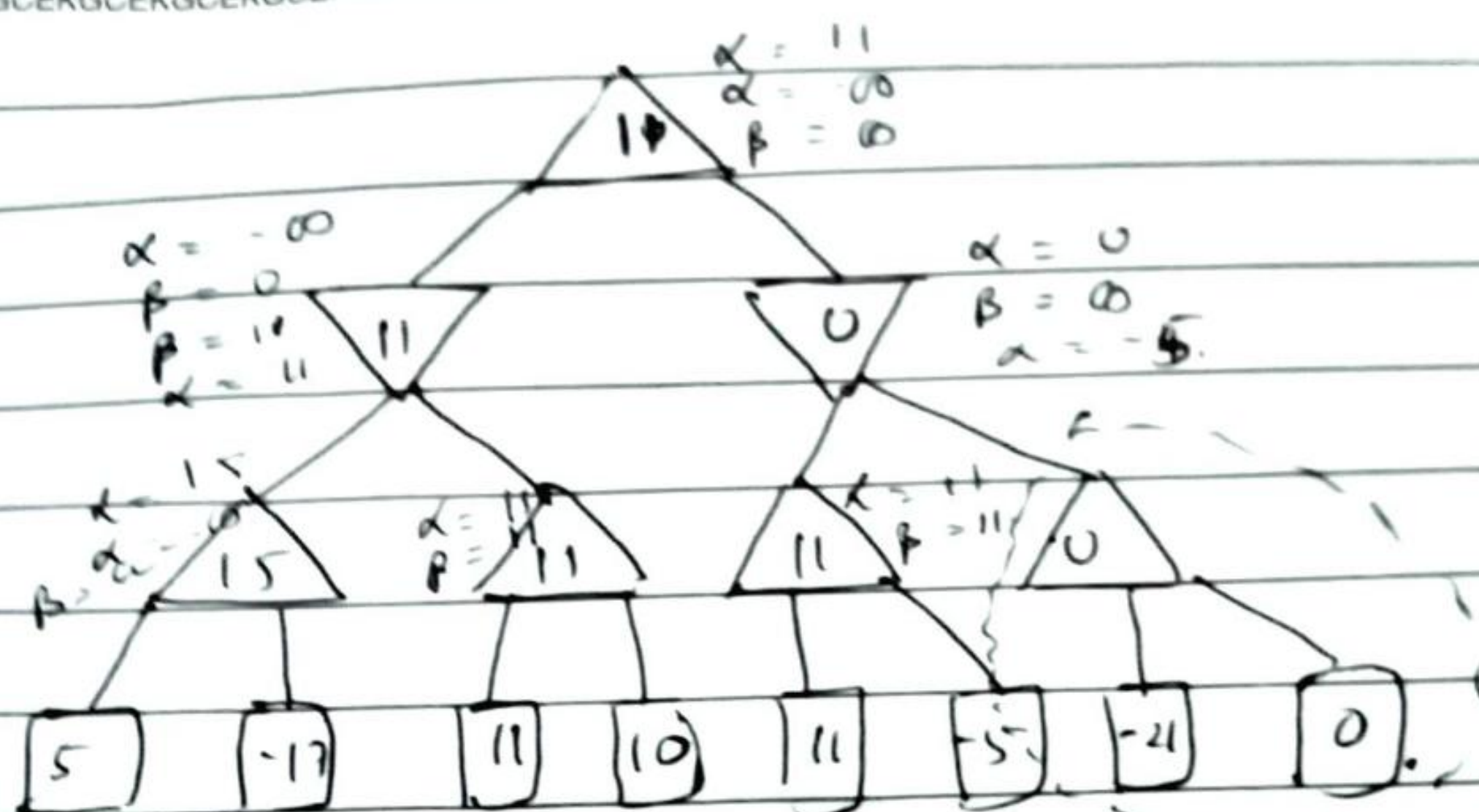
- Initial value of beta is $+\infty$

- Rules and condition:-

- 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 value to child nodes
- 4) Nodes value will be passed to upper nodes instead of value of alpha & beta

1) Condition to prune - $a \geq b$ or $b \leq a$

- when alpha is greater or equal to beta



$$1) \alpha(-\infty, 15) = 15$$

$$\alpha(-\infty, -17) = -17 \quad \dots \text{max (Bottom left)}$$

$$\alpha(15, -17) = 15$$

$$\beta(0, 15) = 15$$

- min (left)

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

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

- max (Bottom left node)

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

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

- stop (max)

$$\beta(15, 11) = 11$$

- min (Right)

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

- max (Bottom right)

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

$$\alpha(11, -5) = 10$$

$$\alpha(11, -5) = 11$$

$$\beta(0, -5) = -5$$

$$\alpha = 11$$

min (Right)

$$\beta = -5$$

- stop

$\therefore \alpha \geq \beta$ so the node is pruned

$$2) \alpha = 11, \beta = 0$$

$$\alpha(11, 0) = 11$$

solution

