

Subject : TS Lab

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Min - Max Algorithm :

Min max algorithm :

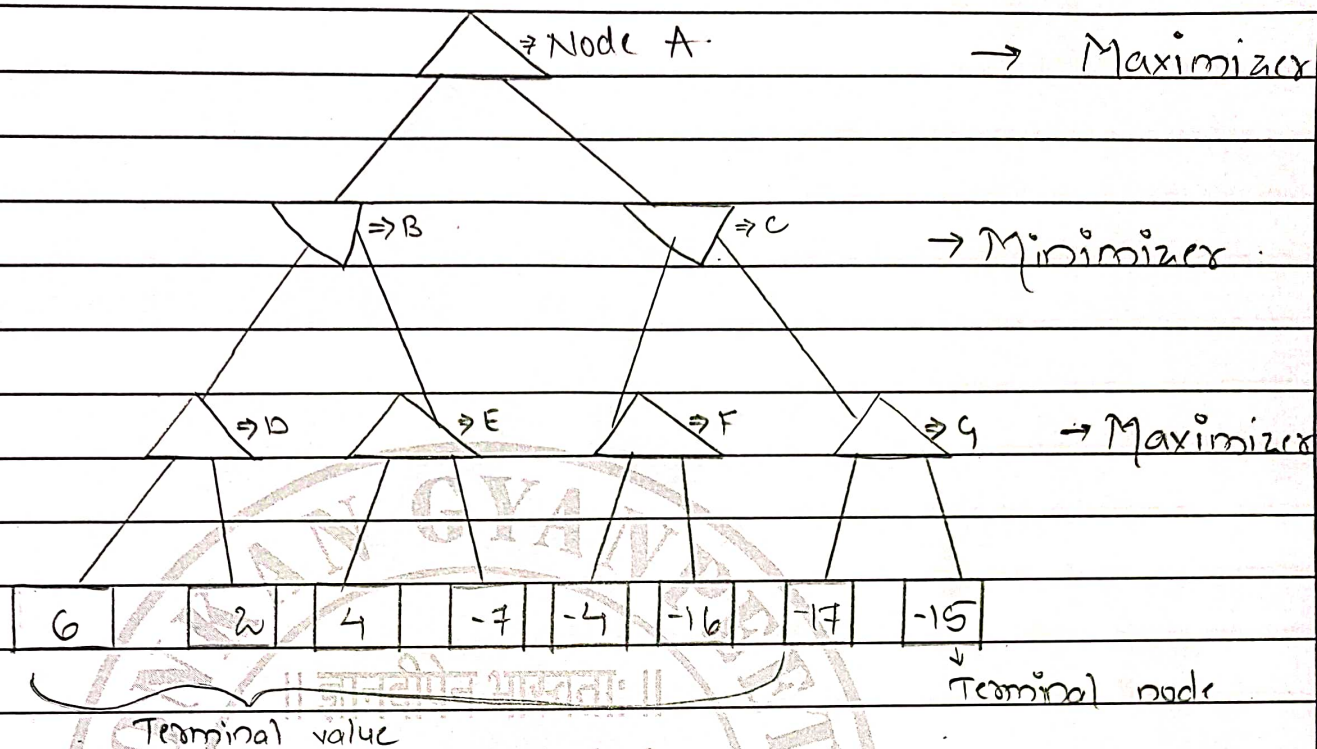
Min-max algorithm is a recursive or backtracking algo which is used in decision-making and game theory. It provides an optimal move for the player assuming that opponent is also playing optimally.

- Min max algo uses recursion to search through the game-tree.
- In this algo two players play the game, one is called MAX and other is called MIN.
- Min-Max algo is mostly used for game playing in AI.

Step 1 :

Let's take A is the initial value = $-\infty$ and mini

Let's take A is the initial state of the tree. Suppose maximizer takes first turn (when α) which has worst-case initial value = $-\infty$, and maxi minimizer will take next turn which has worst-case initial value = $+\infty$.



- Step 2 :

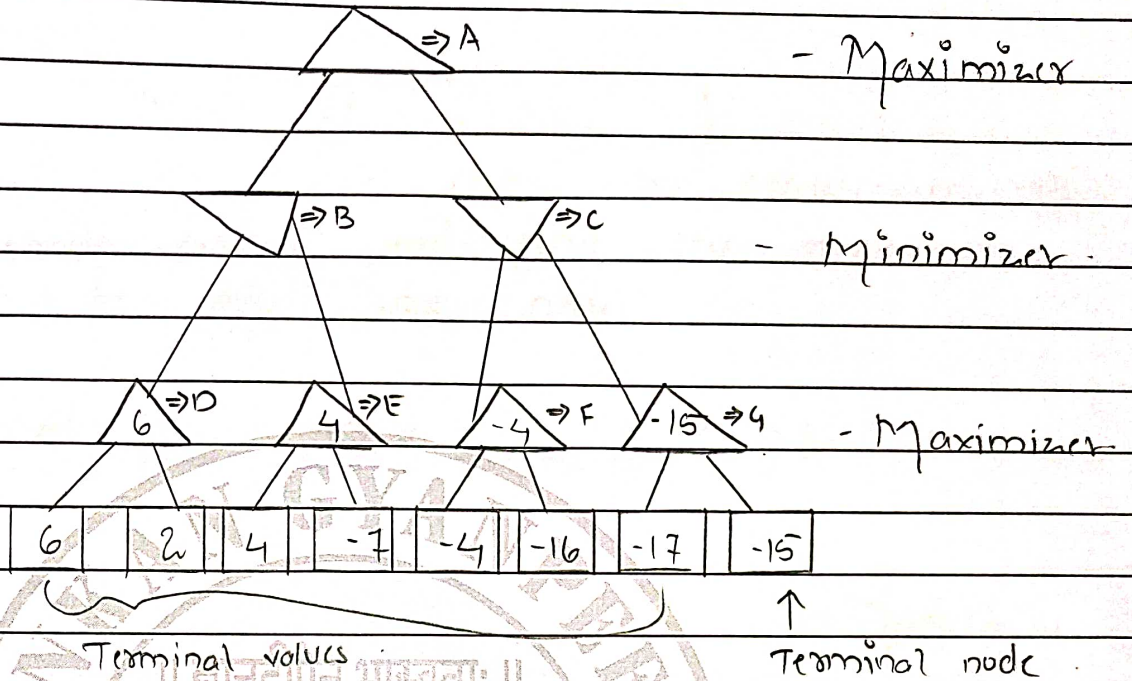
First we find the utilities value for the maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determines the higher nodes values. It will find the maximum among all.

For node D : $\max(6, -\infty) \Rightarrow \max(6, 2) = 6$

For node E : $\max(4, -\infty) \Rightarrow \max(4, -7) = 4$

For node F : $\max(-4, -\infty) \Rightarrow \max(-4, -16) = -4$

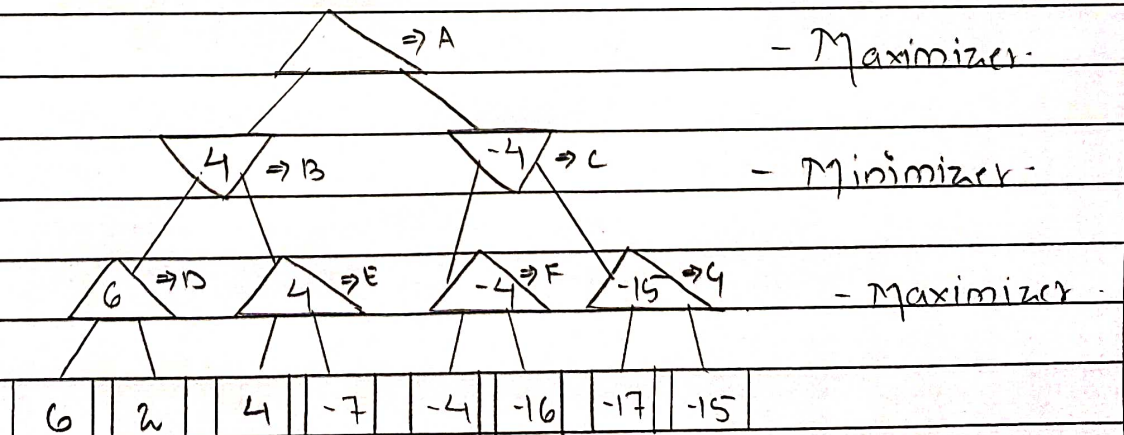
For node G : $\max(-17, -\infty) \Rightarrow \max(-17, -15) = -15$



- Step 3 : In the next step, it's a turn for minimize, so it will compare all nodes value with two, and will find the 3rd layer node value.

For node B - $\min(6, 4) = 4$

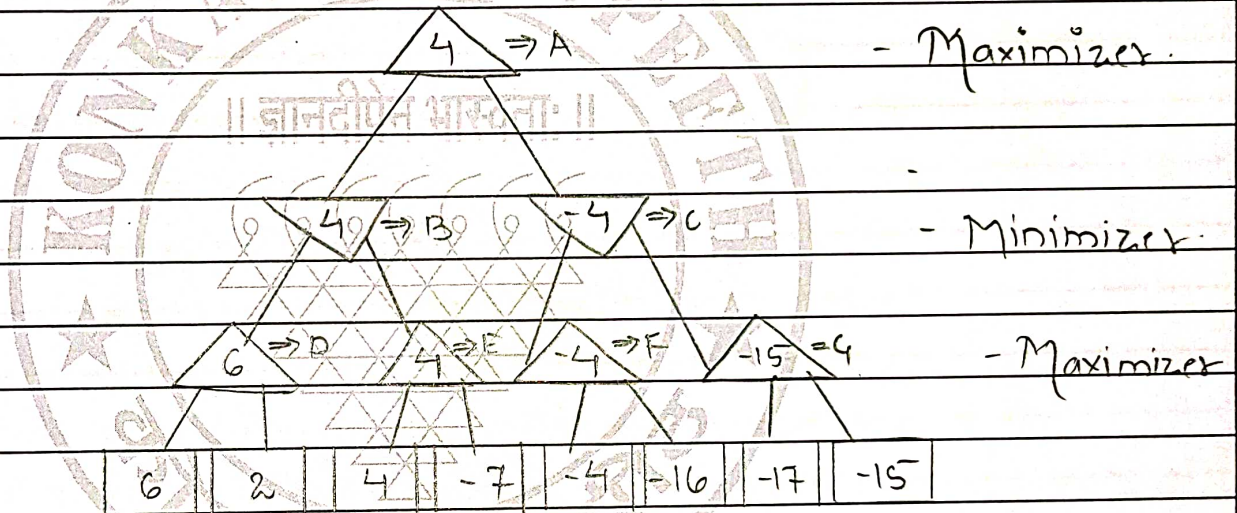
For node C - $\min(-4, -15) = -4$



- Step 4 :

Now its a turn for maximizer, and it will again choose the maximum of all nodes values and find the maximum value for the root node.

For node A : $\max(4, -4) = 4$



Hence, it was the complete workflow of the minimax algorithm with two player game.