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Min-Max algorithm:

Min-max algorithm is a recursive or backtracking algorithm that is used as decision making and game theory to find the optimal move for a player assuming that your opponent also plays optimally.

Min-max algorithm uses recursion to search through game tree.

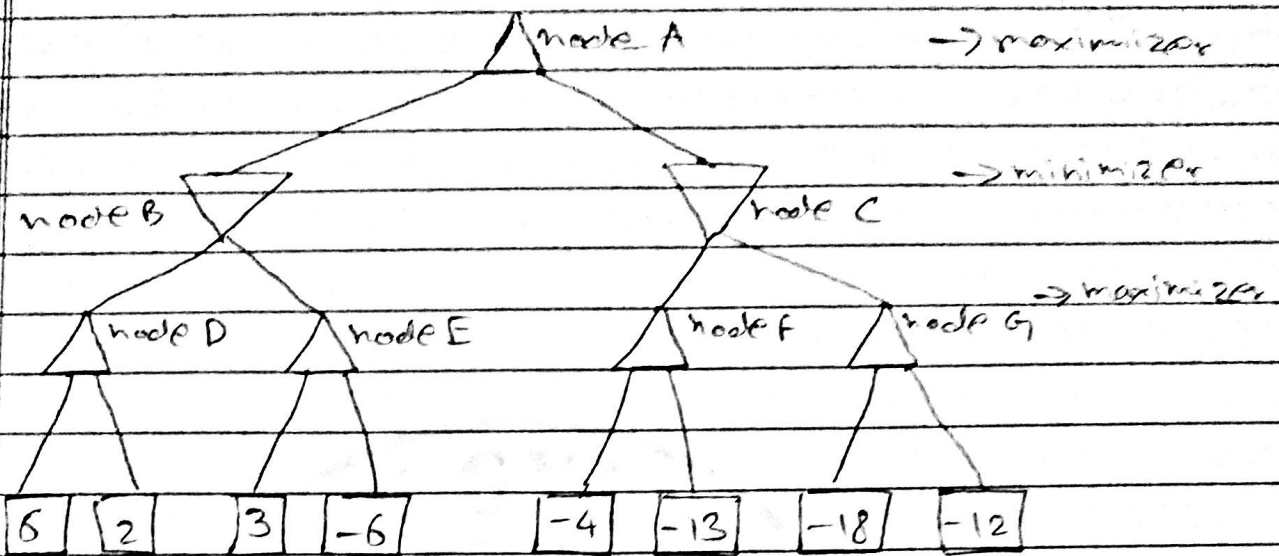
In minmax two players are called minimizer and maximizer.

The maximizer tries to get the highest score possible.

The minimizer tries to get the lowest possible score.

If the minimizer has the upper value in the board state then it will tend to be some negative value.

Step 1 :- Lets take A is the initial state of the tree. Suppose maximizing takes first then which has the worst-case initial value = $-\infty$ and minimize will next turn which has worst case initial value = $+\infty$.



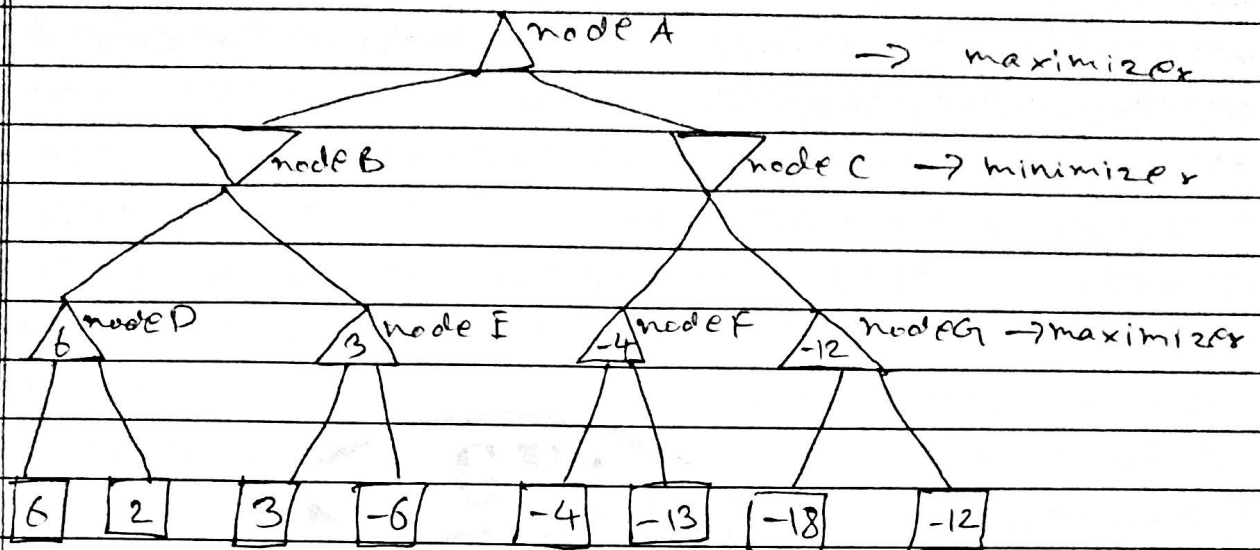
Step 2:- First we find utility value for the maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determine the higher nodes values. It will find the maximum among all.

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

For node E: $\max(3, -\infty) \Rightarrow \max(3, -6) = 3$

For node F: $\max(-4, -\infty) \Rightarrow \max(-4, -13) = -4$

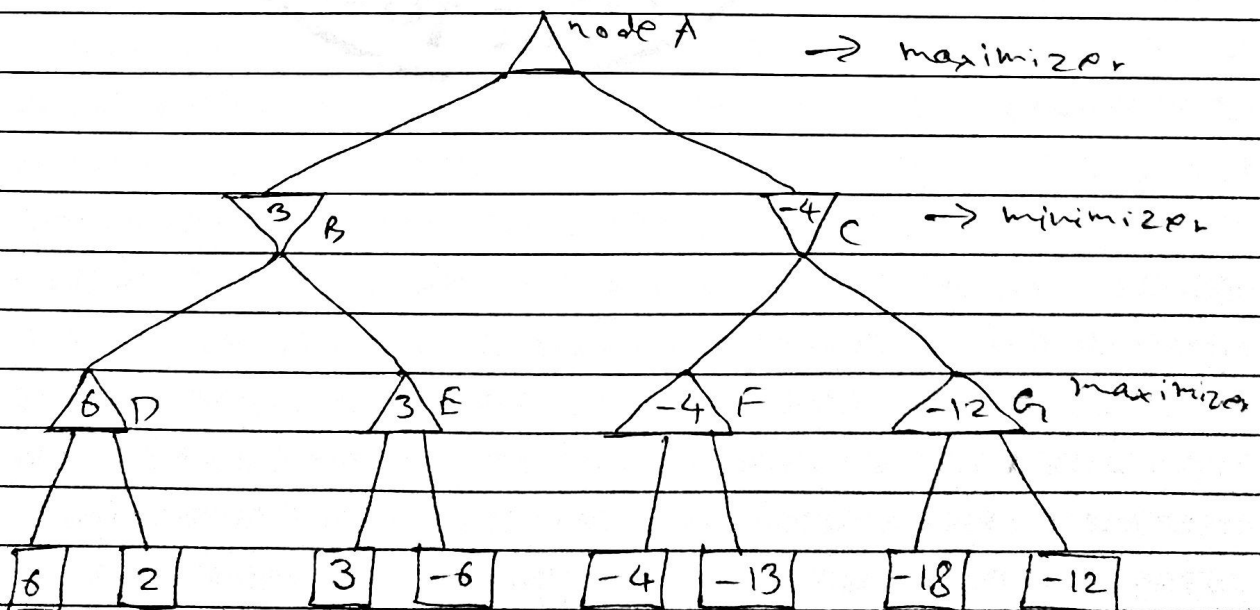
For node G: $\max(-18, -\infty) \Rightarrow \max(-18, -12) = -12$



Step 3:- In the next step it is a turn for minimizer, so it will compare all nodes value with two, and will find the 3rd larger node value.

For node B : $\min(6, 3) = 3$

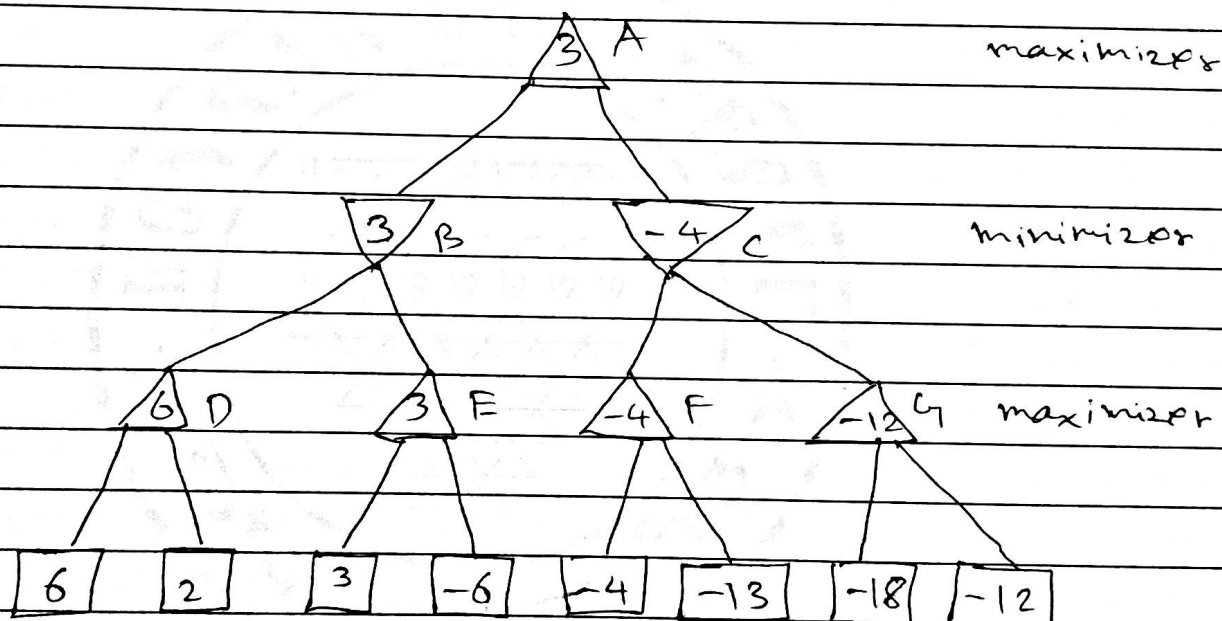
For node C : $\min(-4, -12) = -4$



Step 4 :

Now it is 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 : $\max(3, -4) = 3$



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