K.G.C.E.
Karjat - Raigad

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# Min-Max Algorithm:

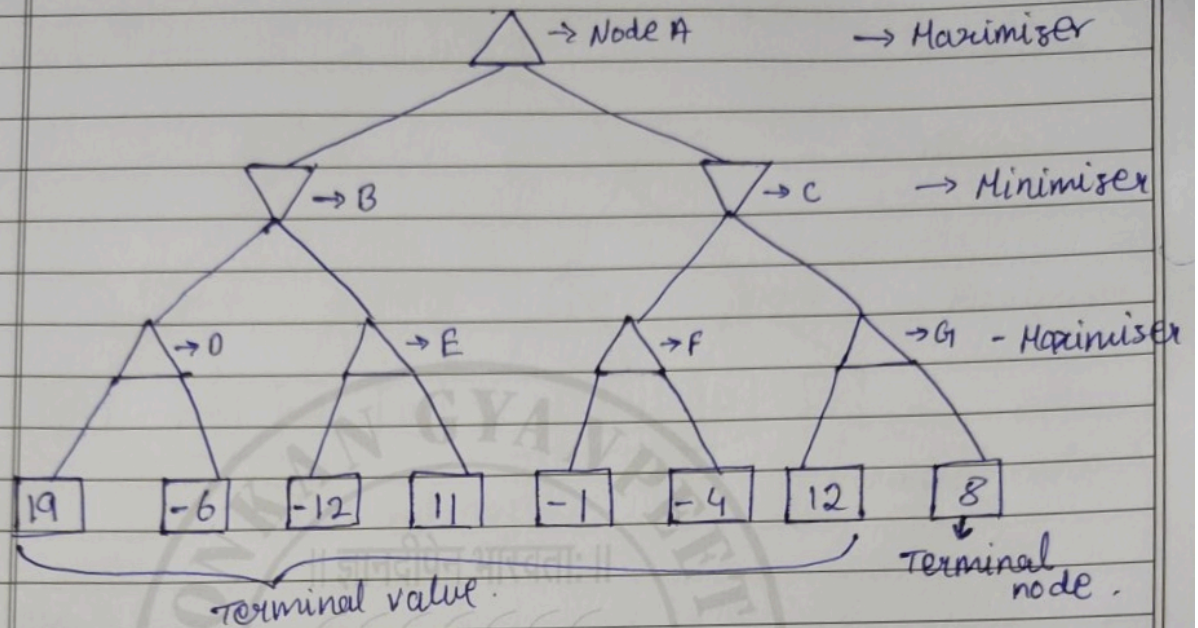
## Min max algorithm:

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

- Min max algo uses recursion to search through the game-tree.
- In this algo 2 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.

Lets take A is the initial state of the tree. suppose maximizer takes first turn which has worst-case initial value = -infinity, and minimize will take next turn which has worst case intial value = +infinity.




- Step 2 :-

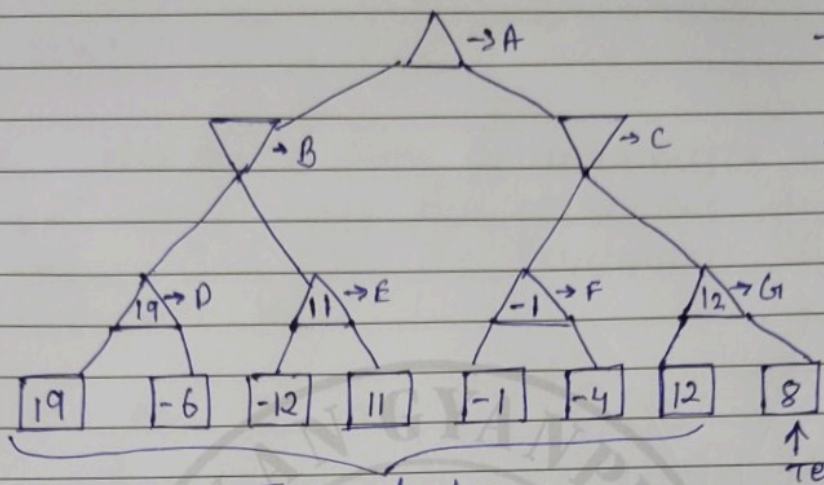
First we find the utilities value for the maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determines the higher nodes values. It will find the maximum among all.

For node D : $\max(19, -\infty) \rightarrow \max(19, -6) = 19$.

For node E : $\max(11, -\infty) \rightarrow \max(-12, 11) = 11$

For node F : $\max(-1, -\infty) \rightarrow \max(-1, -4) = -1$

For node G : $\max(12, 8 -\infty) \rightarrow \max(12, 8) = 12$

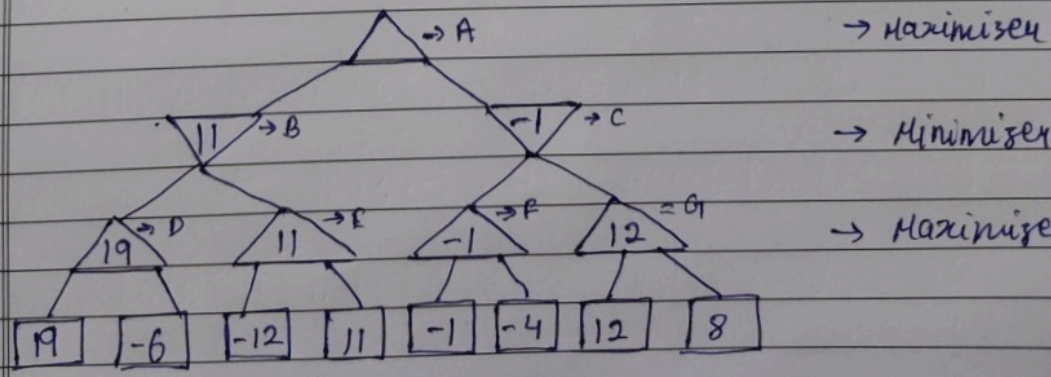



Step 3 :-

In the next step, it's a turn for minimizer, so it will compare all nodes value with 2, and will find the 3rd layer node value.

For node B = min (19, 11) = 11

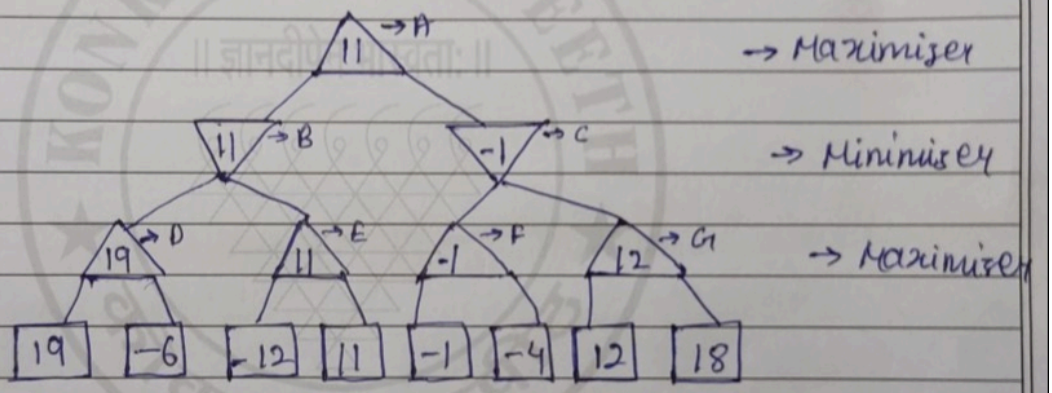
For node C = min (-1, 12) = -1



- 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 (11, -1) = 11




Hence, it was the complete work flow of the minmax algorithm with 2 player game.