

DOP	DCA	Remark	Sign.

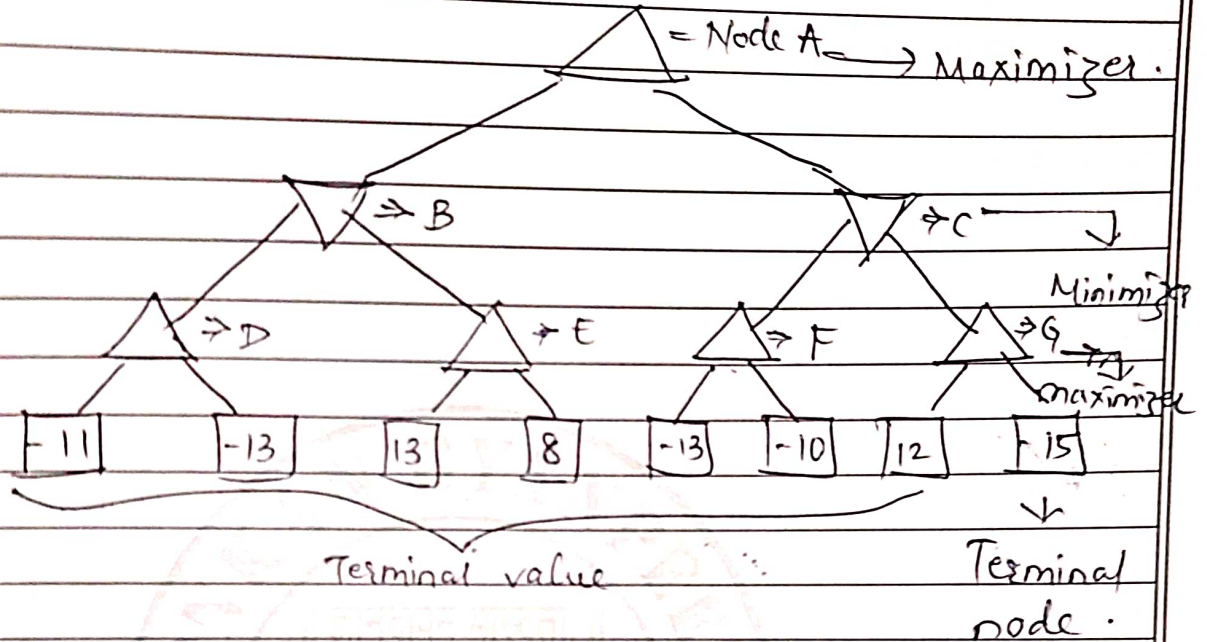
→ Min-Max Algorithm

Min-Max Algorithm :

Min-max algorithm is a recursive a 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 state of the tree. Suppose maximizer takes first turn (when or) which has worst-case initial value = $-\infty$, and minimizer will take next turn which has worst-case initial value = $+\infty$.



Step 2:

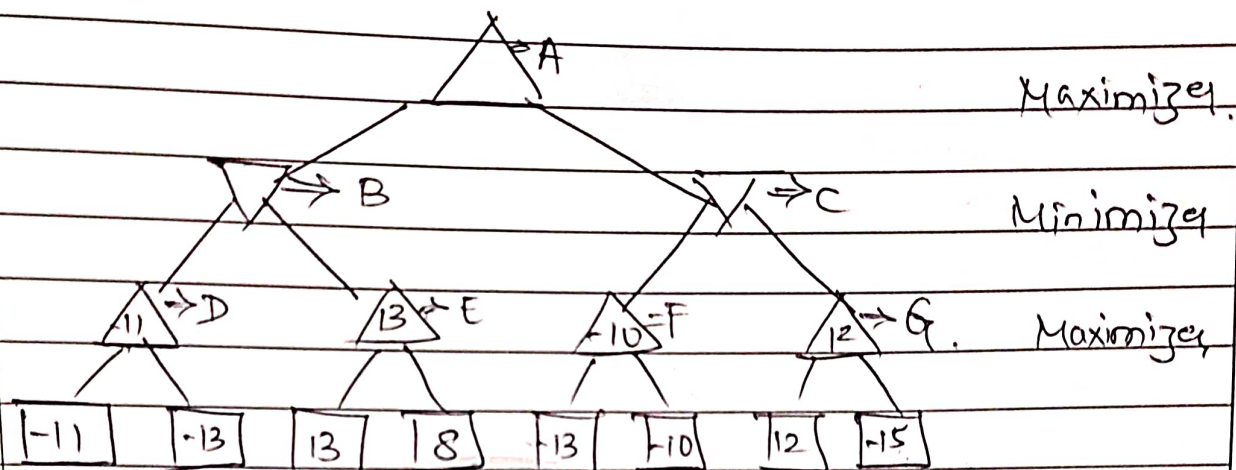
First we find the utilities value for the maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determines the higher nodes values. It will find the maximum among all.

$$\text{for node D : } \max(-11, -\infty) \Rightarrow \max(-11, -13) = -11$$

$$\text{for node E : } \max(13, -\infty) \Rightarrow \max(13, 8) = 13$$

$$\text{for node F : } \max(-10, -\infty) \Rightarrow \max(-10, -13) = -10$$

$$\text{for node G : } \max(12, -\infty) \Rightarrow \max(12, -15) = 12$$

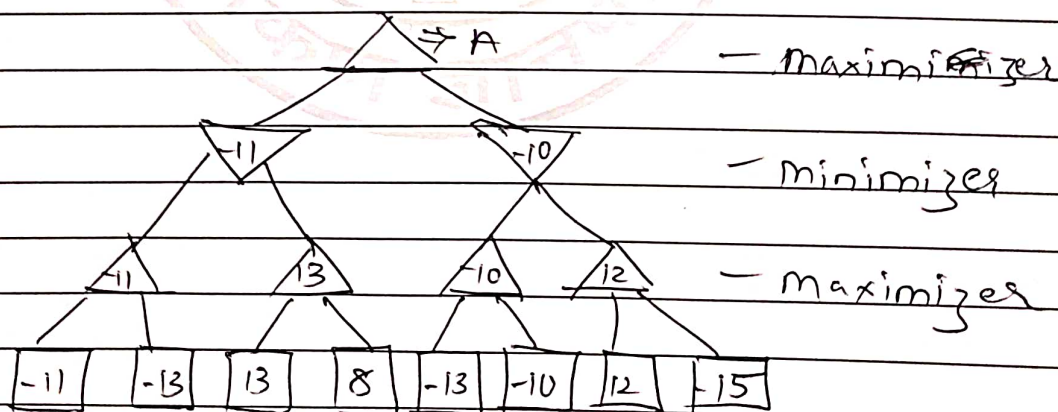


Step 3:

In the next step, it's a turn for minimize
or it will compare all nodes values with
too, and will find the 3rd layer node value.

For node B $\Rightarrow \min(-11, 13) = -11$

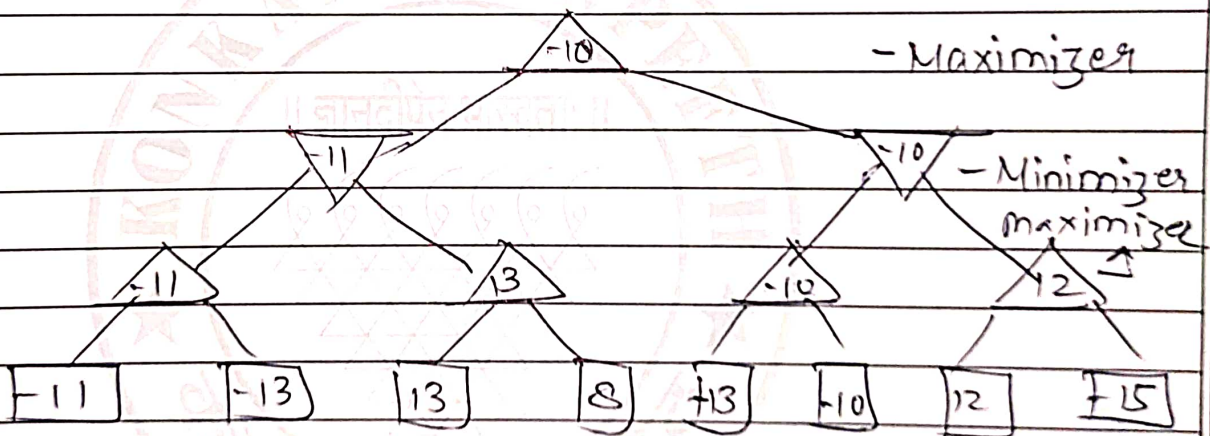
For node C $\Rightarrow \min(-10, 12) = -10$,



- 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 : $\max(-11, -10) = -10$



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