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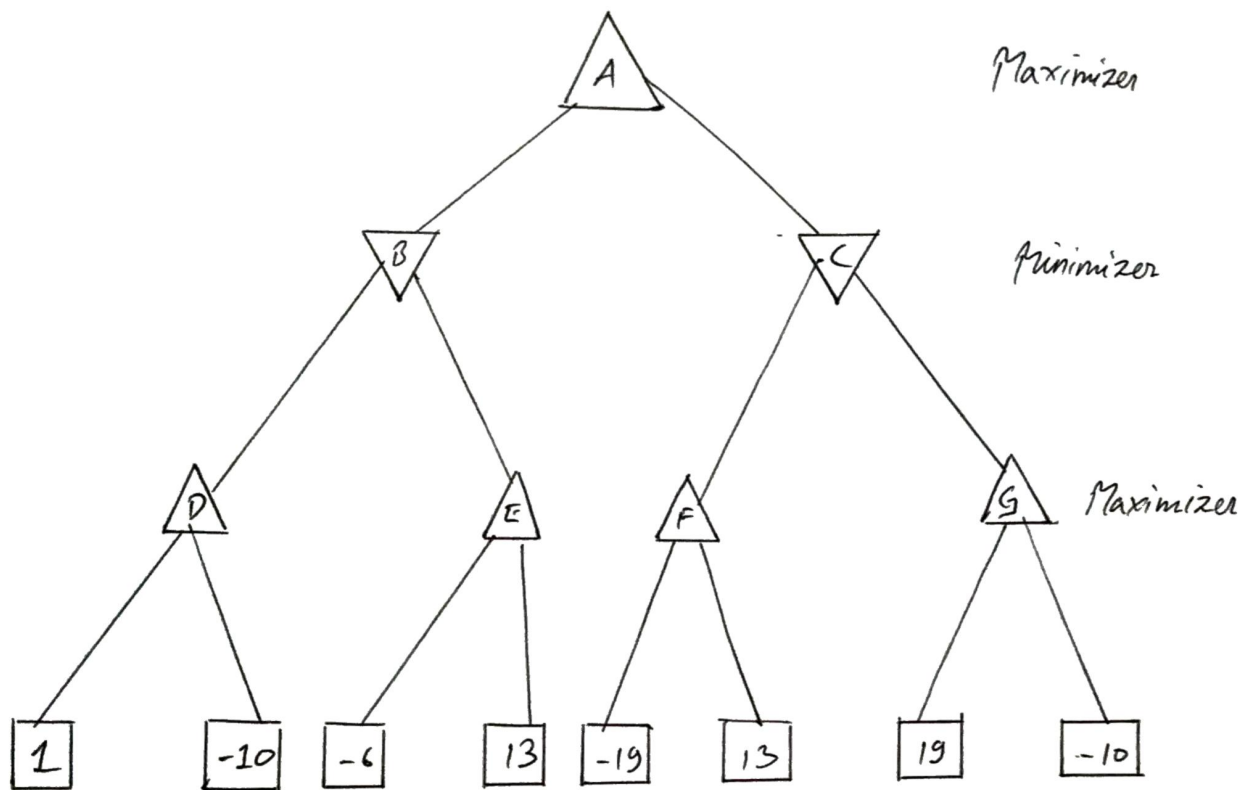
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SUBJECT: IS Lab

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## Minimax Algorithm

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

- > Minimax algorithm uses recursion to search through the game tree.
- > In this algorithm, two players play the game, one is called Max, while the other is called Min.
- > Minimax algorithm is mostly used for game playing in AI.

### Step 1:

Let's take A as the initial state of the tree. Suppose maximizer takes first turn which has worst case initial value  $= (-\infty)$  and minimizer takes 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 node values. It will find the maximum amongst all.

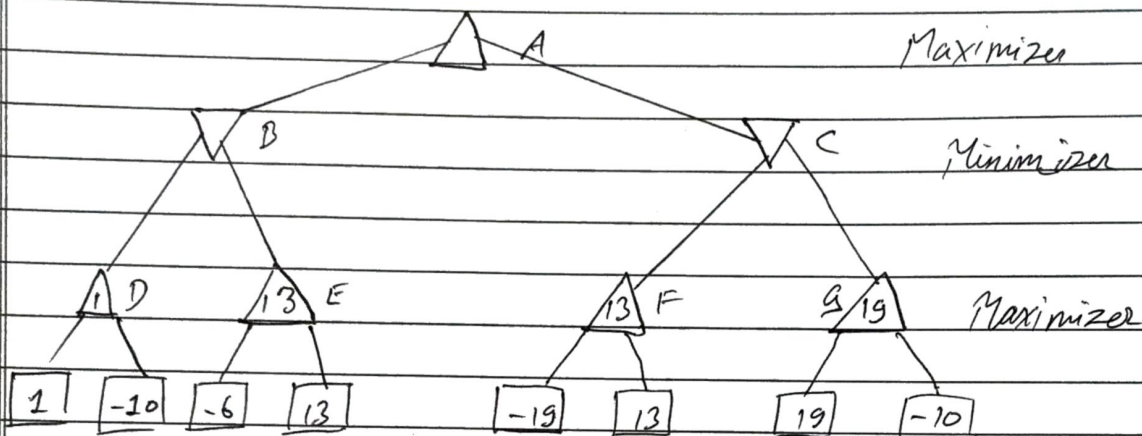


Node A:  $\max(1, -10) = 1$

Node B:  $\max(-6, 13) = 13$

Node F:  $\max(-19, 13) = 13$

Node G:  $\max(19, -10) = 19$



Step 3:

Now it is minimizer's turn, and hence it will compare the node values and will find the third layer node value.

Node B:  $\min(1, 13) = 1$

Node C:  $\min(13, 19) = 13$

Step 4:

Finally, the maximizer will choose the max of the node values below its level

So, Node A:  $\max(1, 13) = 13$

