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Subject :- IS Lab

DOP	DOA	Remark	Sign

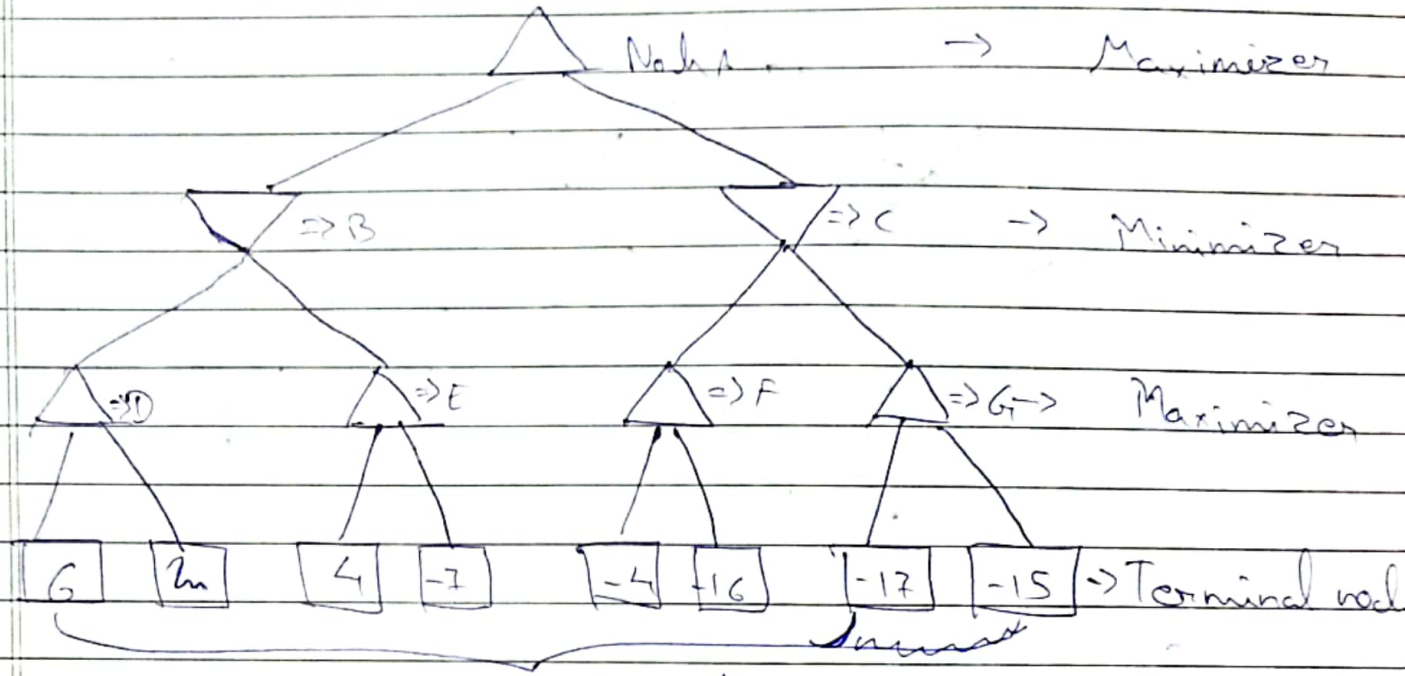
Min - Max Algorithm

-> 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 for game playing in AI

- Step :-

Lets take A is the initial state of the tree. Suppose maximizer takes first turn (take as) which has worst-case initial value = -infinity minimizers will take next turn which has worst case initial value = +infinity



step 2:-

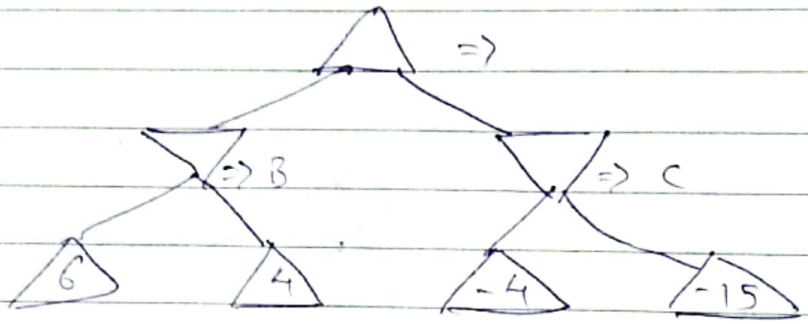
First we fix the utilities value for maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determines the higher nodes values. It will find the maximum among all.

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

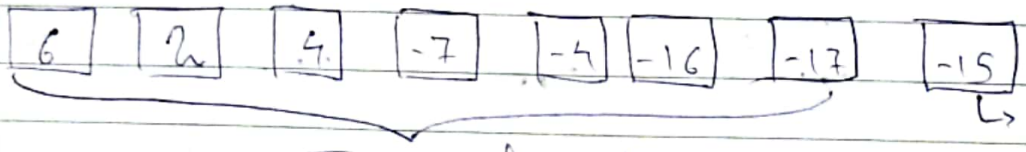
For node E : $\max(4, -\infty) \Rightarrow \max(4, -7) = 4$

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

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



- Maximizer
- Minimizer
- Maximizer



↳ Terminal node

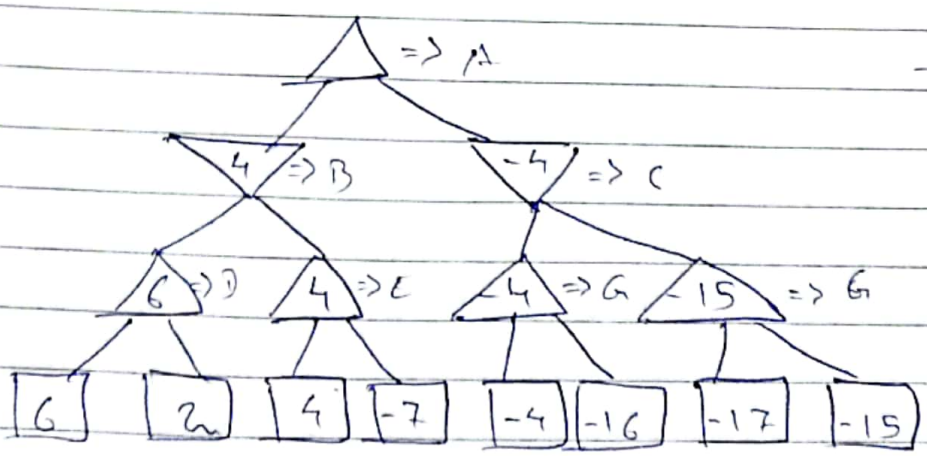
Terminal value

step 3:-

In the next step its 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

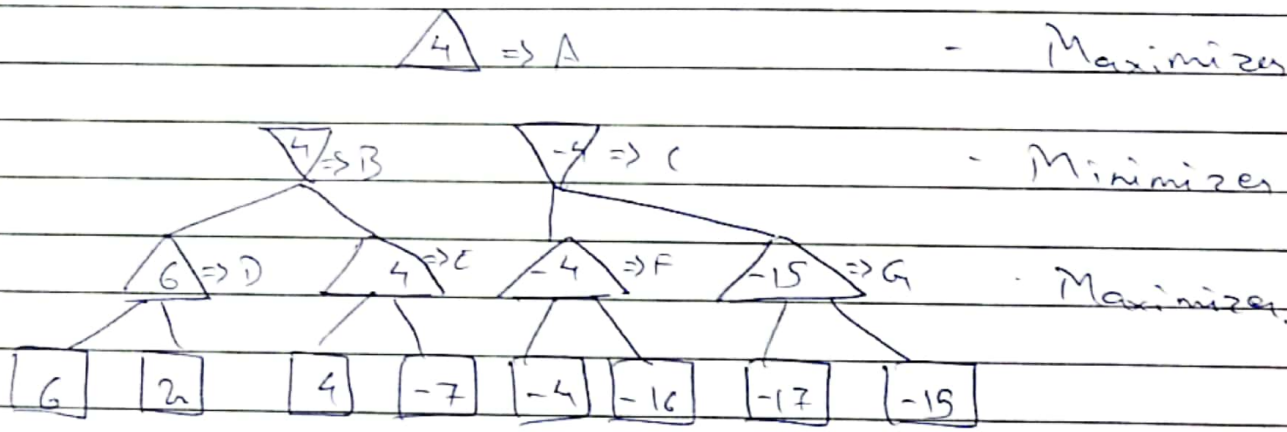


- Maximizer
- Minimizer
- Maximizes

step 4

Now its a turn for maximizer & it will again choose the maximum of all nodes value & find the maximum value for the root node

For node A = max (4, -4) = 4



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