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Subject : IS lab

DOP	DOA	Remark	Sign

Min - Max Algorithm :

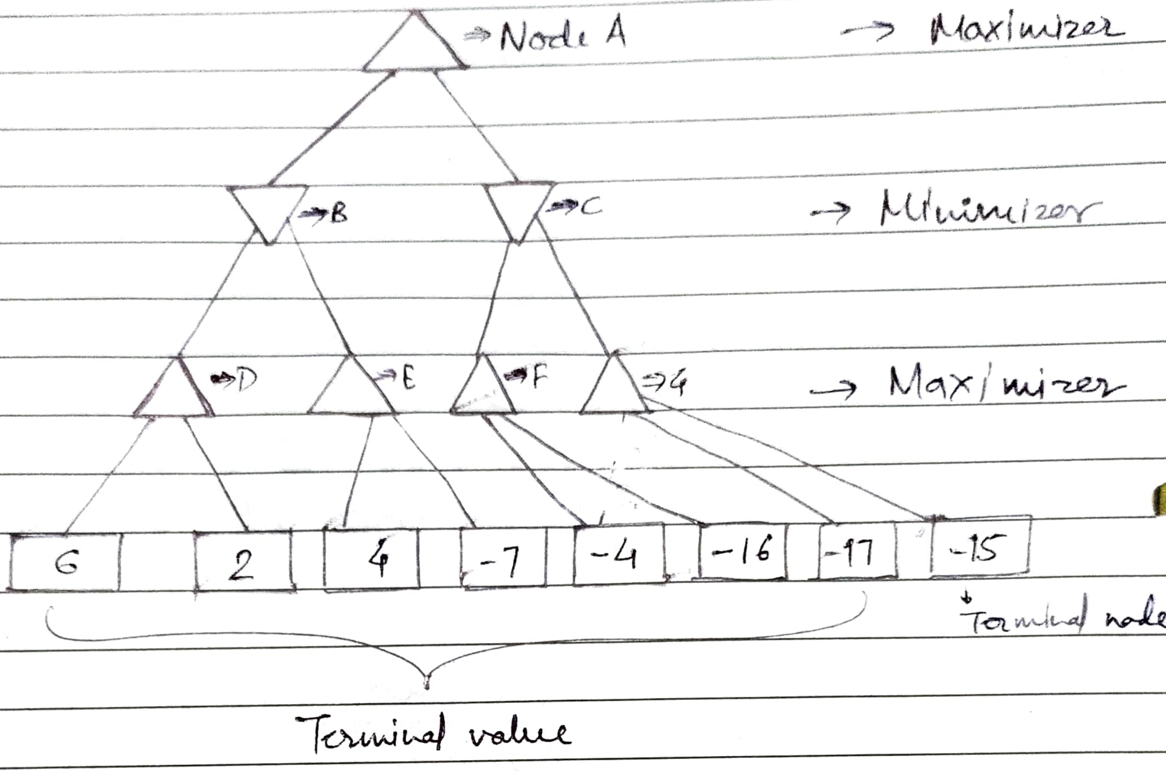
Min max algorithm :

Min - max algorithm is a recursive or back tracking 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 :**

  Lets take A is the initial state of the tree. Suppose maximizes takes first turn (worst case) which has worst - case initial value = - infinity, and minimizes will take next turn which has worst - case initial value = + infinity.



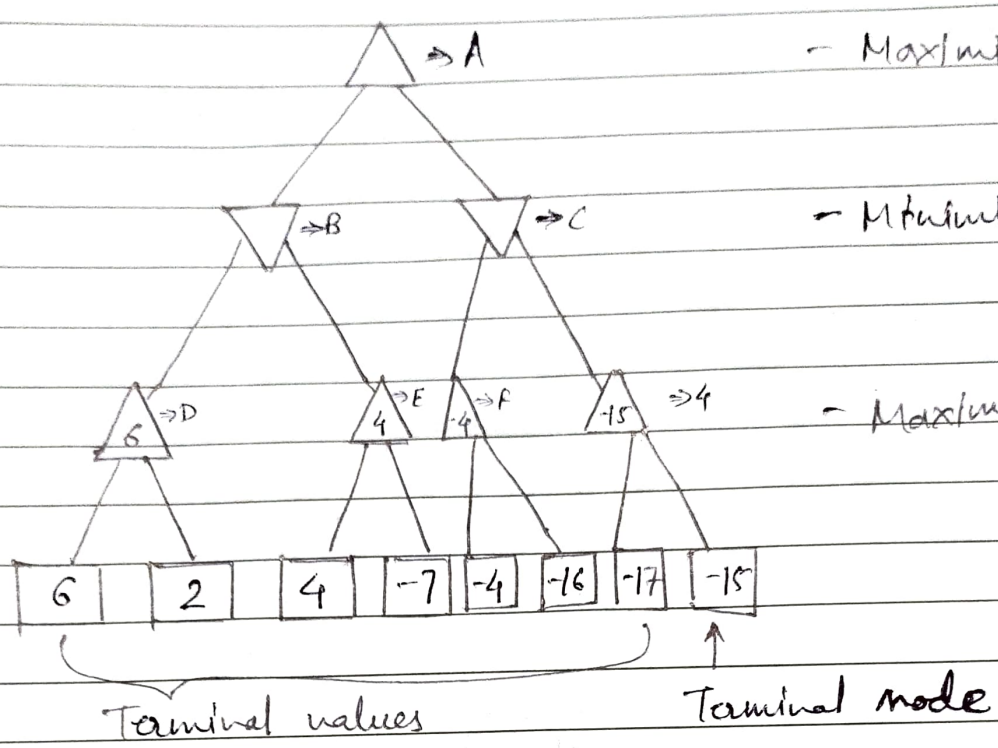
– Step 2 : First we find the utilities value for the maximizes, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizes and determines the higher ~~nodes~~ nodes values - It will find the maximum among all.

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

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

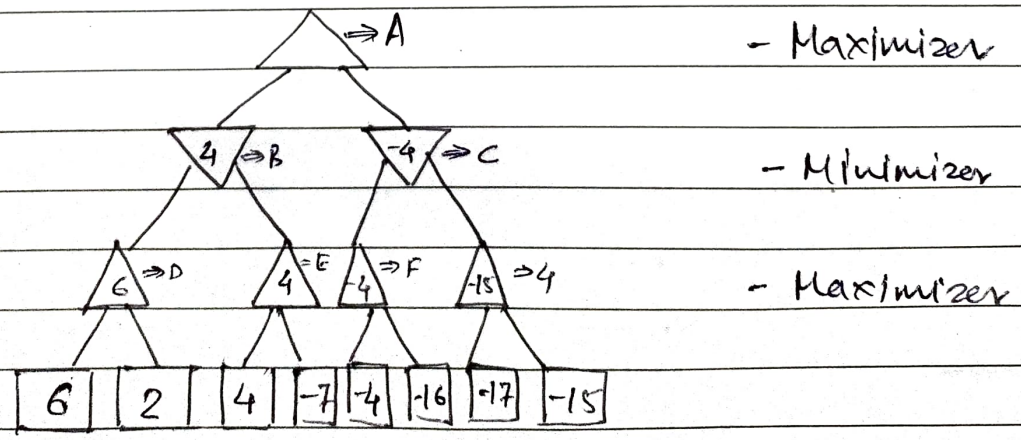
For node F : max $(-4, -\infty) \Rightarrow$ max $(-4, -16) = -4$

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



- Step 3: In the next step, it's a turn for minimize, so it will compare all nodes value with ~~two~~ too, and will find the 3rd layer node value.

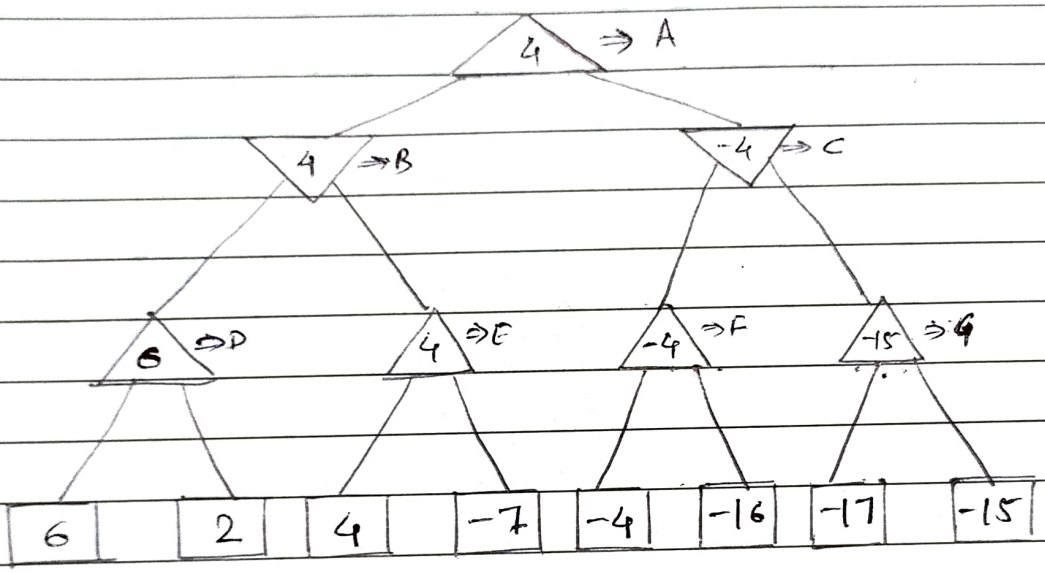
For node B - Min (6, 4) = 4
For node C - Min (-4, -15) = -4



- 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 (4, -4) = 4



- Maximizer
- Minimizer
- Maximizer

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