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class - BEIT

subject .IS Lab

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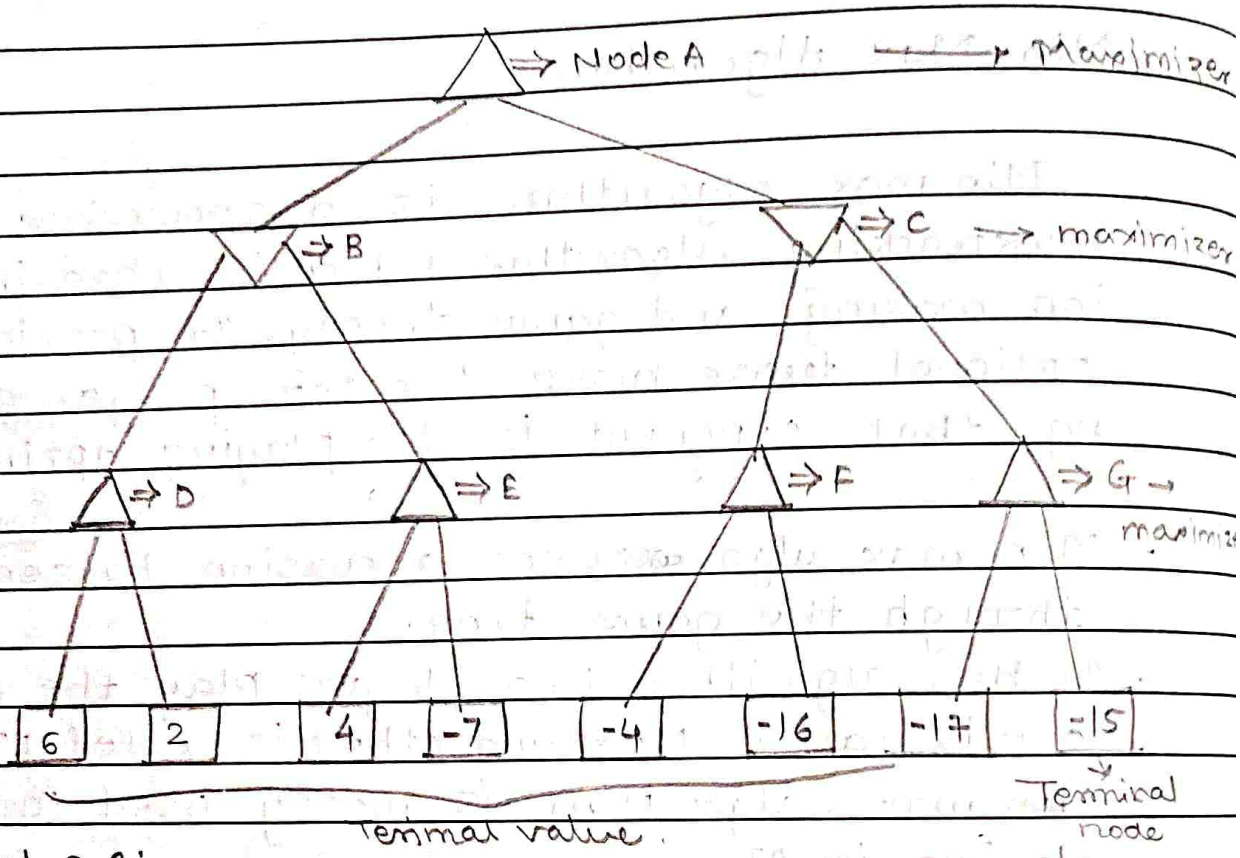
Min Max Algorithm

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

- Min max algo uses recursion to search through the game-tree.
- In this algorithm two players play the game, one is called MAX and other is called MIN.
- Min max algorithm is mostly used for game playing in AI.

- Step1:

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



step 2:

first we find the utilities value for the ~~maximizer~~ maximizer. its initial 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 (6, 2) ⇒ max(6, 2) = 6~~

~~for node B : max(4, -7, -∞) ⇒ max (4, -∞) = 4~~

~~for node F : max(-4, -16) ⇒ max(-4, -16) = -4~~

~~for node G : max(-17, -15)~~

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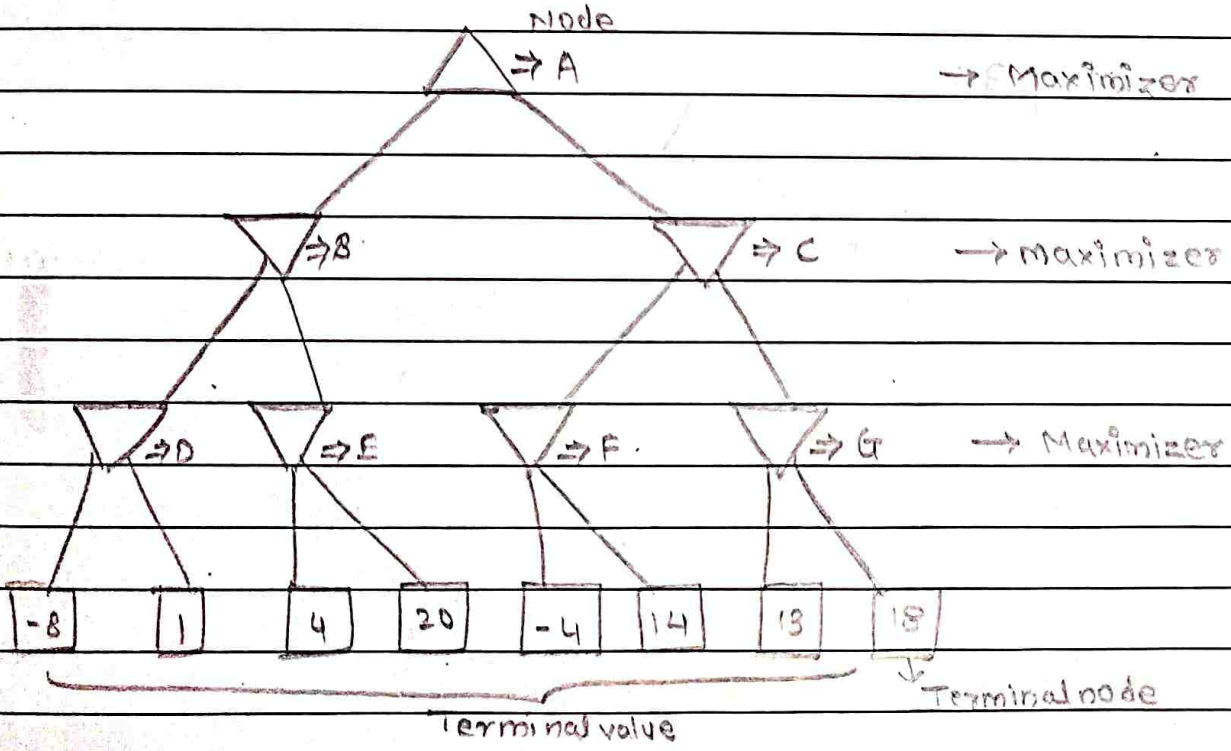
for node D : max(-8, -∞) ⇒ max(-8, 1) = 1

for node E : max(4, -∞) ⇒ max(4, 20) = 20

for node F : max(-4, -∞) ⇒ max(-4, 14) = 14

for node G : max(13, -∞) ⇒ max(13, 18) = 18



step 3 :

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

for node B : min(1, 20) = 1

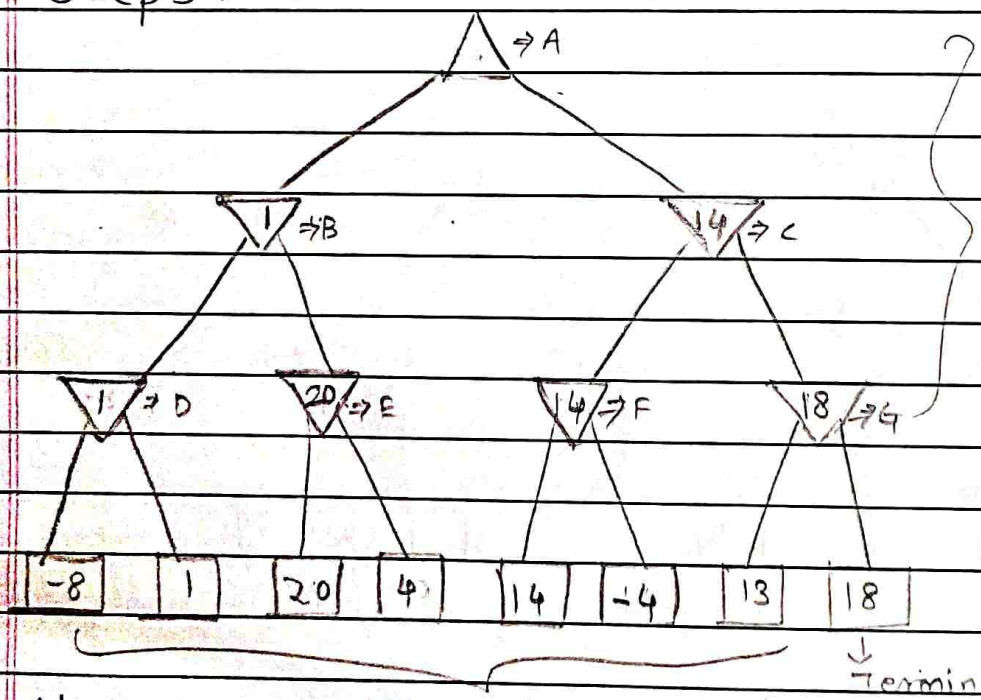
for node C: min(14, 18) = 14.

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 (1, 14) = 14

step 3:



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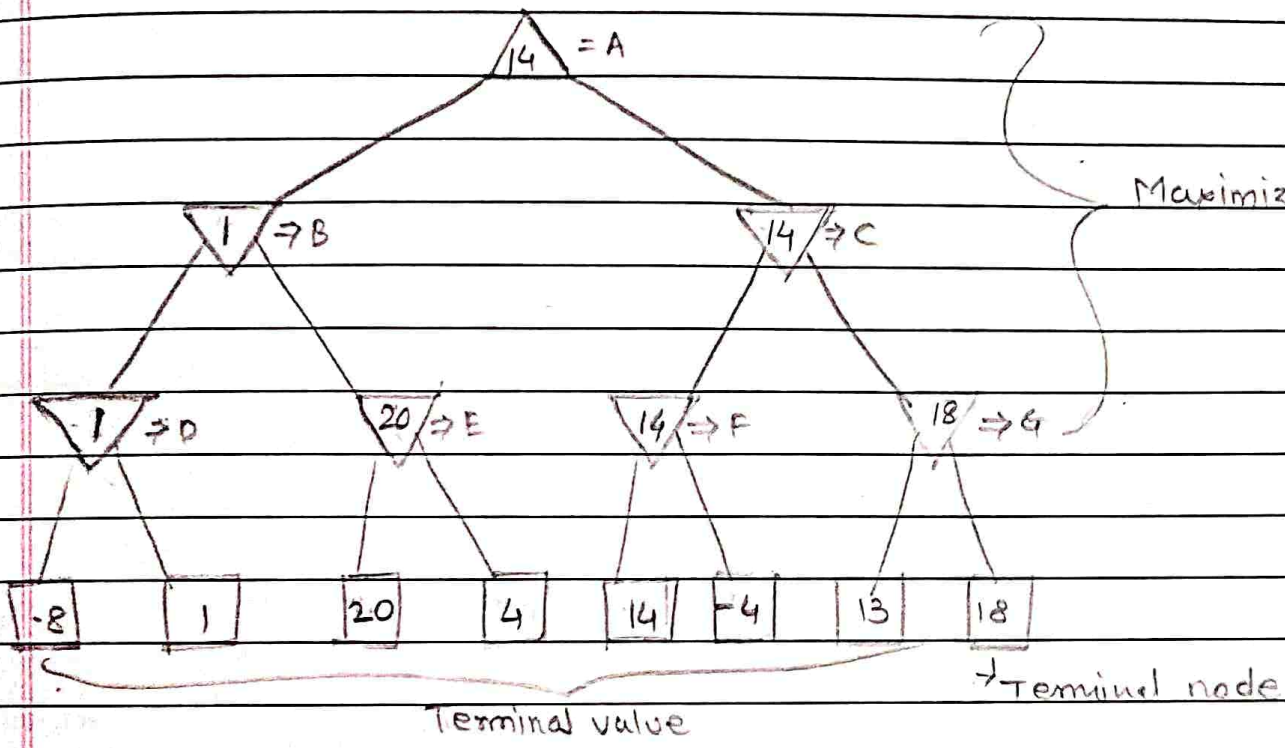
Step 4 :



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