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Name :- Nishad N. Shinde

class :- B.E/I.T

Roll No. :- 63

Subject :- IS Lab

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Min - Max Algorithm :

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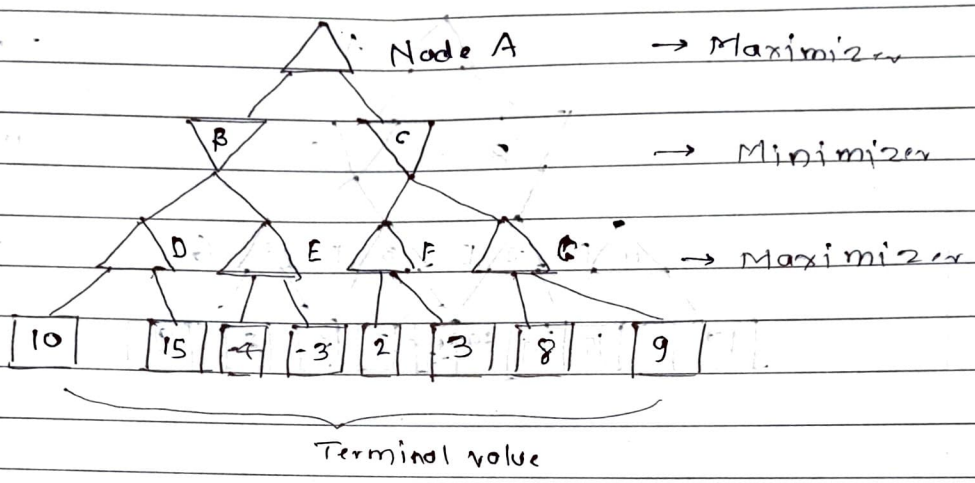
Min max algorithm :

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 playing in AI.

- Step 1 :

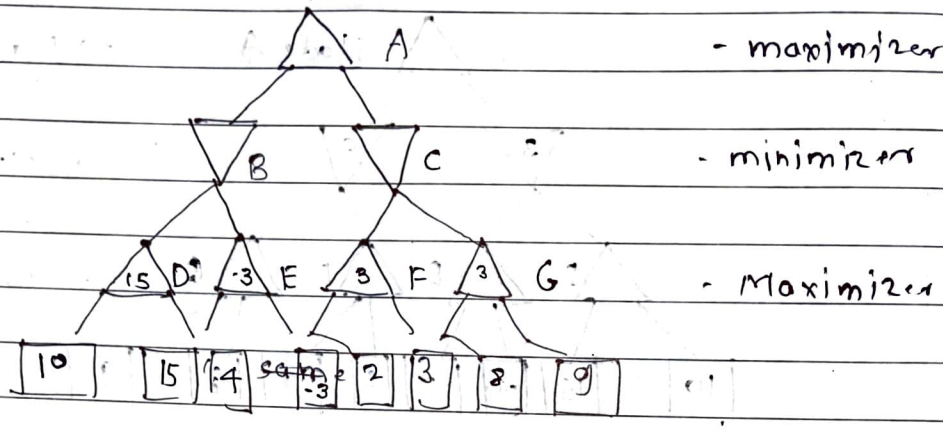
Let's take A is the initial state of the tree. Suppose maximizer takes first two (when A) which has worst-case initial value = - infinity, and minimizer will take next turn which has worst case initial value = + infinity



- Step 2 :

first we find the utility value for the maximizer. its initial value is $-\infty$ so we use 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 $\max(10, -\infty) \Rightarrow \max(10, 15) \Rightarrow 15$
for node E $\max(-4, \infty) \Rightarrow \max(-4, -3) \Rightarrow -3$
for node F $\max(2, -\infty) \Rightarrow \max(2, 3) \Rightarrow 3$
for node G $\max(8, \infty) \Rightarrow \max(8, 9) \Rightarrow 9$

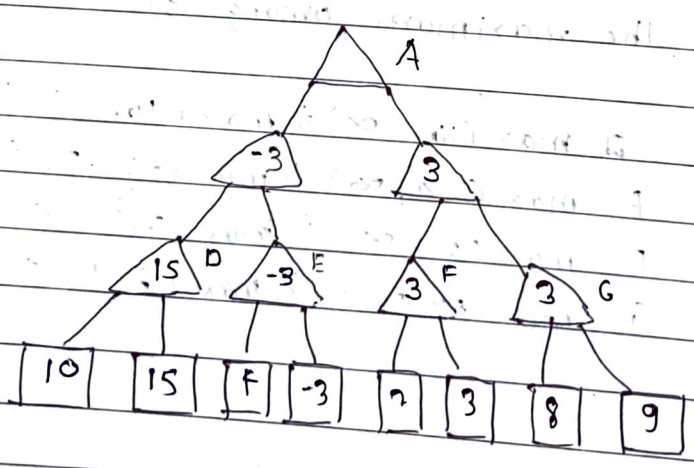


- Step 3:

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

For node B $\min(15, -3) \Rightarrow -3$

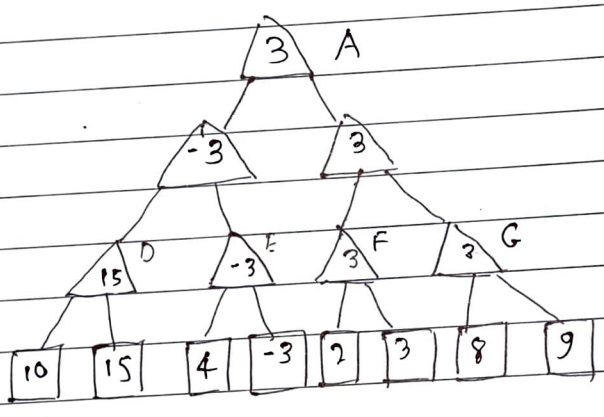
For node C $\min(3, 9) \Rightarrow 3$



- Step 4:

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

for node A max (-3, 3) ⇒ 3



- Maximizer
- Minimizer
- Maximizer

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