Page No. :
Date :

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Class :- B.E. IT

Subject : ISLAB

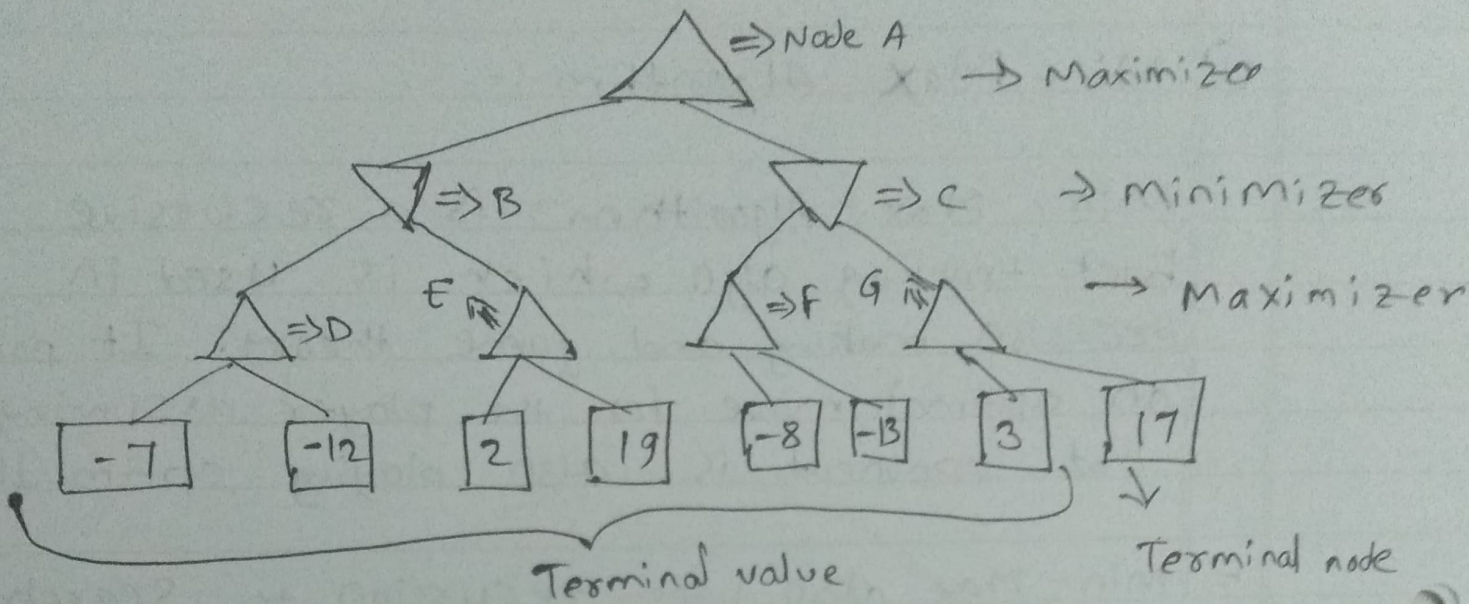
① Min-Max Algorithm :-

Min-Max Algorithm : is a recursive 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 also uses recursion to search through the game-tree.
- In this algo two players play the game ; one is called Max & other is called MIN.
- MIN-MAX algo is mostly used for game playing in AI.

Step 1 :

Lets take A in the initial state of the tree. suppose minimizer take first turn (which 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 ut

Step 2:

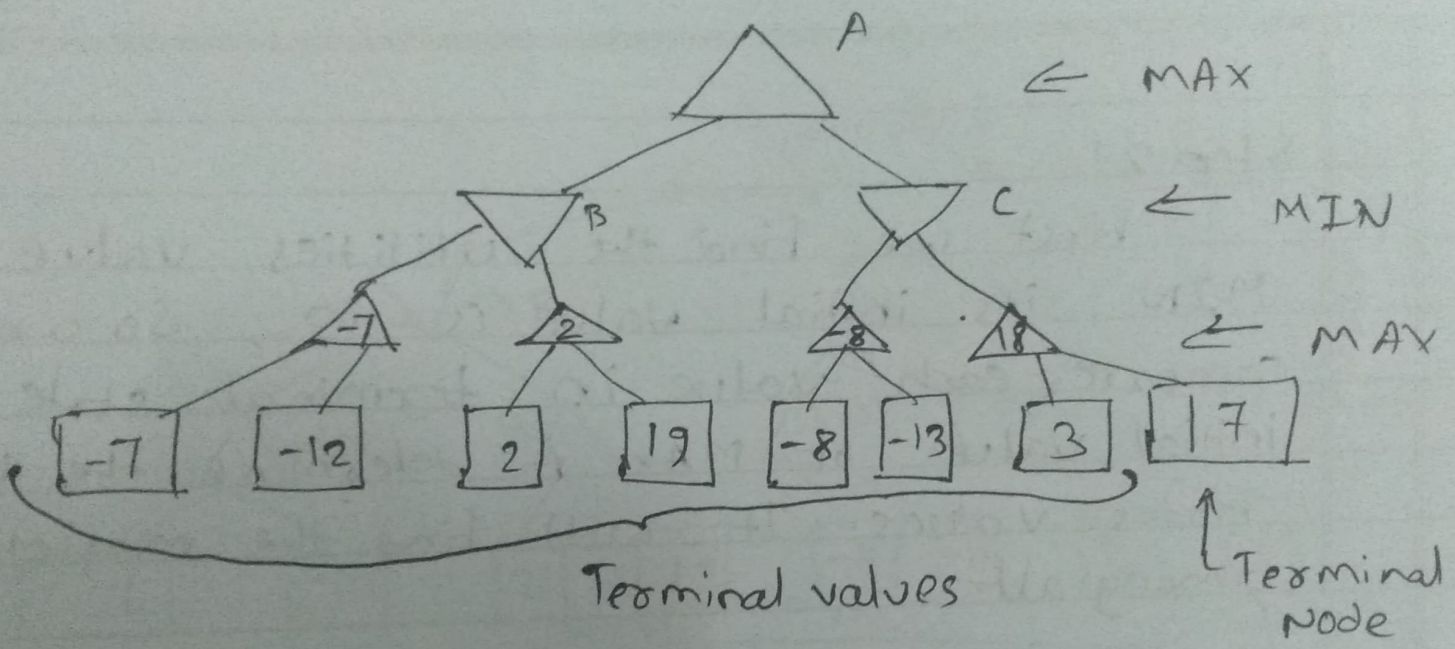
First we find the utilities value for MIN, its initial value is $-\infty$, So we will compare each value in terminal state with initial value of MAX. & determine the highest nodes values. It will find the maximum among all.

for node D: $\max(-7, -\infty) \Rightarrow \max(-7, -12) = -7$

for node E: $\max(2, -\infty) \Rightarrow \max(2, 19) = 19$

for node F: $\max(-8, -\infty) \Rightarrow \max(-8, -13) = -8$

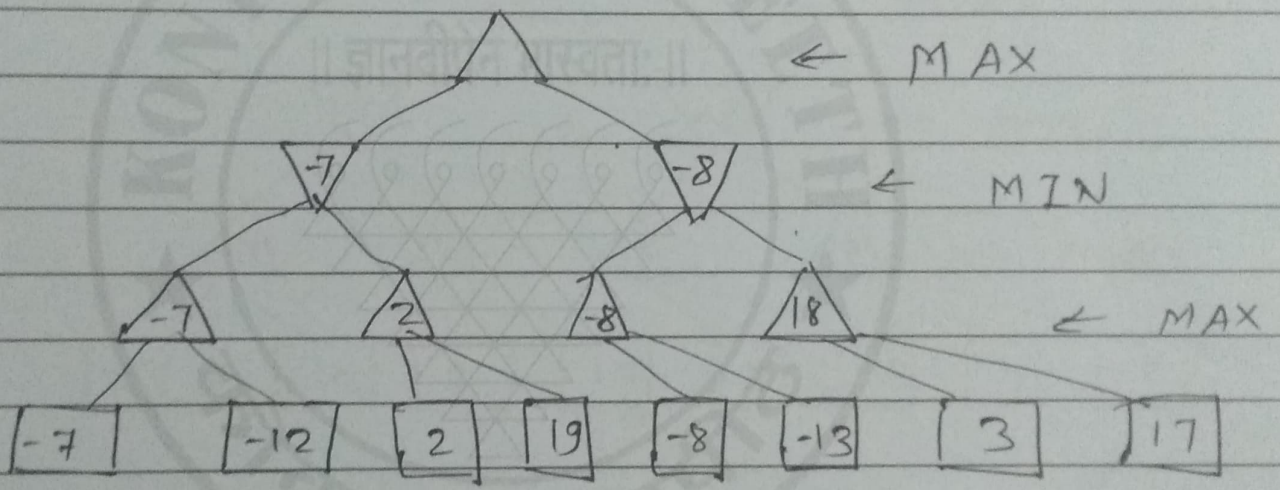
for node G: $\max(3, -\infty) \Rightarrow \max(3, 17) = 17$ [7]


A
MAX
B
C
MIN
-7
2
-8
18
MAX
-7
-12
2
19
-8
-13
3
17
Terminal values
Terminal Node

Step 3:

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

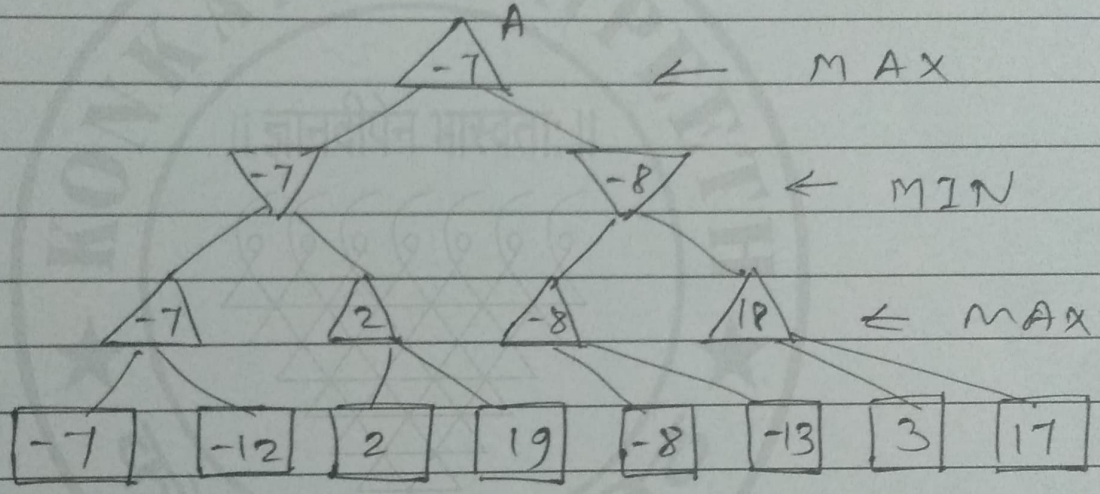
for node B: min (6, -7, 2) = -7
for node C: min (-8, 18) = -8



Step 4:

Now its a turn for MAX and it will again choose the maximum of all node values & find the maximum value for the root node

For node A: max: (-7, -8) = -7



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