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Batch : I3

SEM : 7/17.

SUBJECT : TS LAB.

DOP	DOB	REMARK	SIGN

Min-max Algorithm.

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.

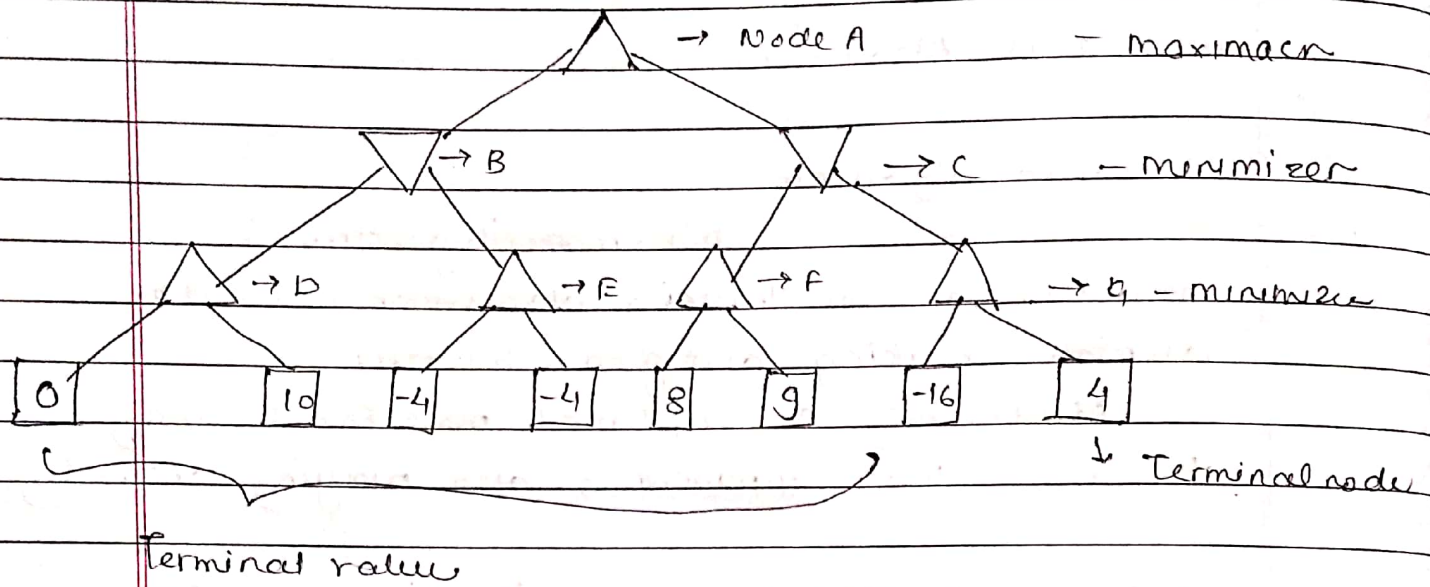
- min max algo uses recursion to search through the game-tree.

- In this algo two players play the game, one is called MAX and other is called MIN.

- min-max algo is mostly used for game playing in AI.

STEP 1 :

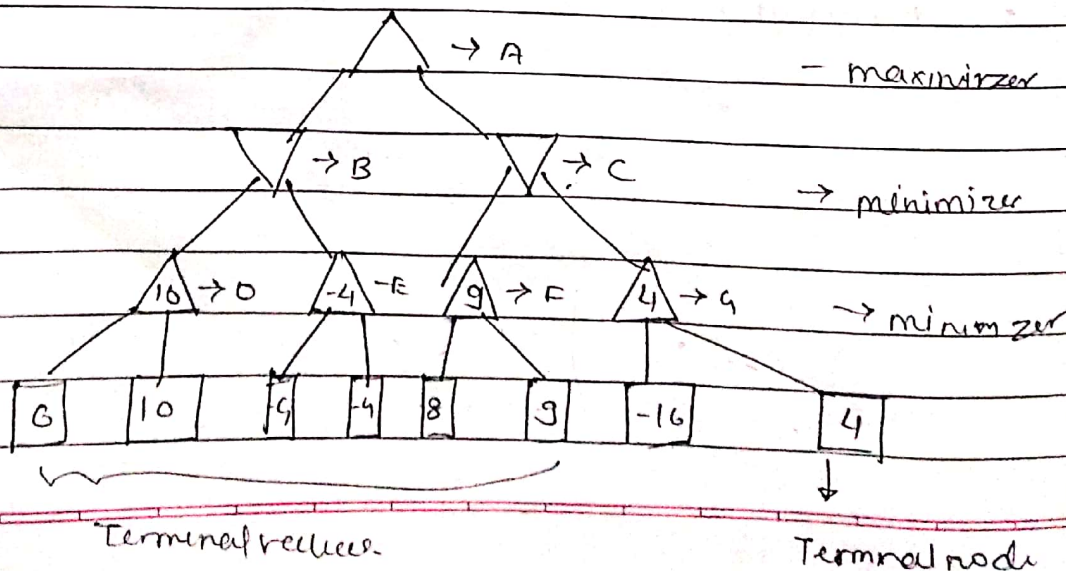
lets take A is the initial state of the tree. Suppose maximize takes first turn (when $-\infty$) which has worst case initial value, and minimize will take next turn which has worst case initial value $= +\infty$.



STEP 2:

First we find the utilities value.
 For the minimizer, its initial value is $-\infty$
 so we will compare such at maximizer & determine the higher node values. It will find the maximum among all.

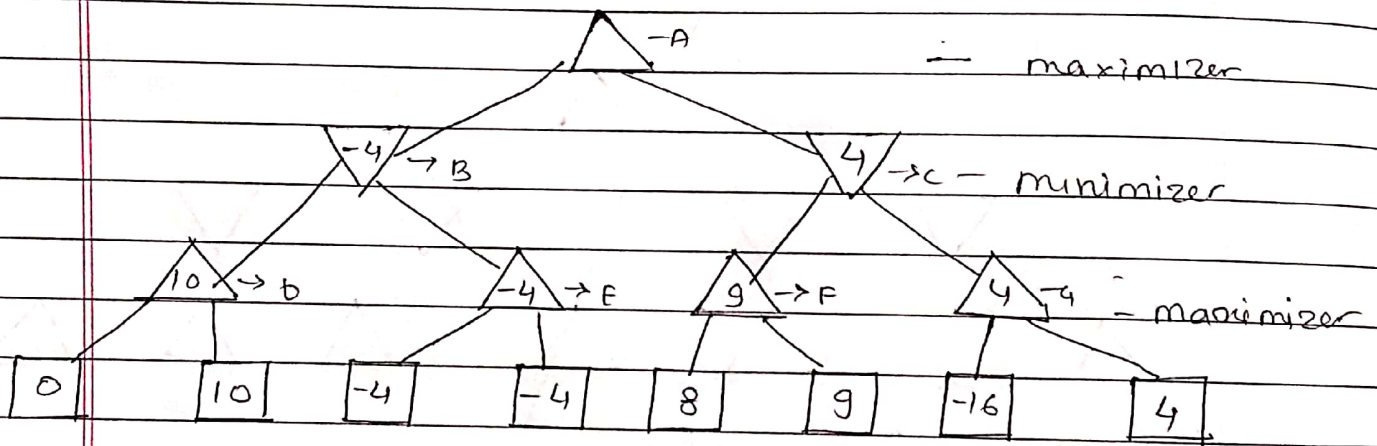
For node D = $\max(0, -\infty) \rightarrow \max(0, 10) = 10$
 For node E = $\max(-4, -\infty) \rightarrow \max(-4, -4) = -4$
 For node F = $\max(8, -\infty) \rightarrow \max(8, 9) = 9$
 For node G = $\max(-16, -\infty) \rightarrow \max(-16, 4) = 4$



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

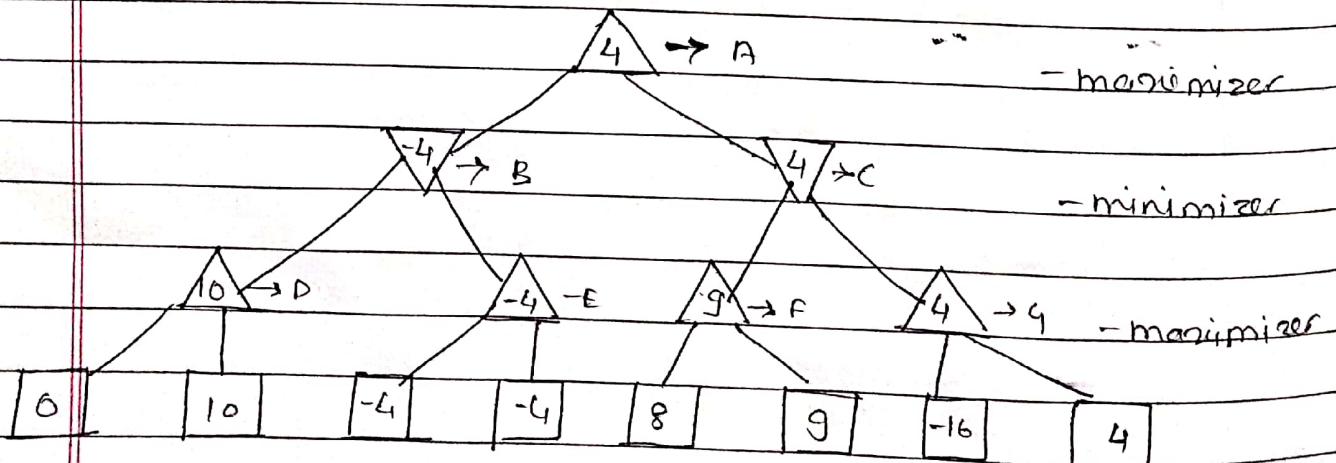
For node B : $\min(10, -4) = -4$

For node C : $\min(9, 4) = 4$



STEP 4 : Now it's a turn for maximizer and it will choose the maximum of all node values and find the maximum value to the root value.

For node A : $\max(-4, 4) = 4$



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

