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subject :- IS Lab.

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Min Max Algorithm :-



Min max algorithm:

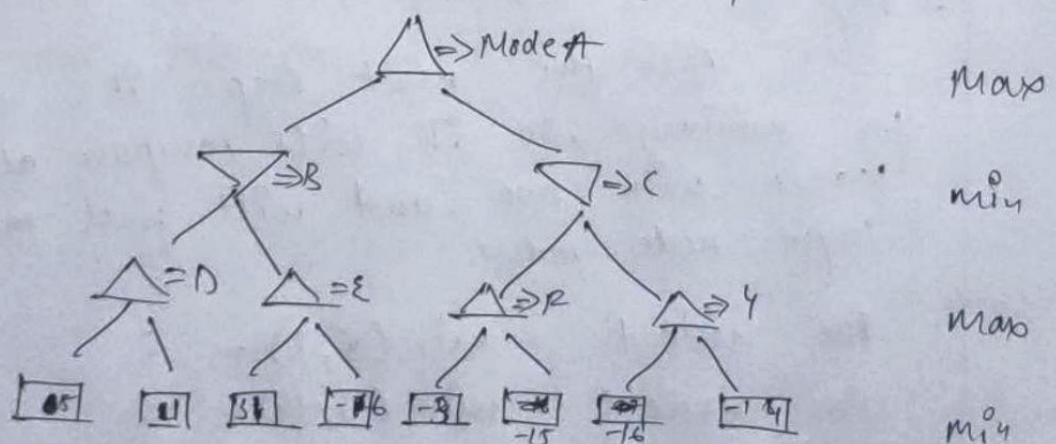
Min-max algorithm is a recursive backtracking algo which is used in decision-making & game.

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 & other is called MIN.
- Min-Max algo is mostly used for game playing in AI.

- Step 1:-

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



- step 2:-

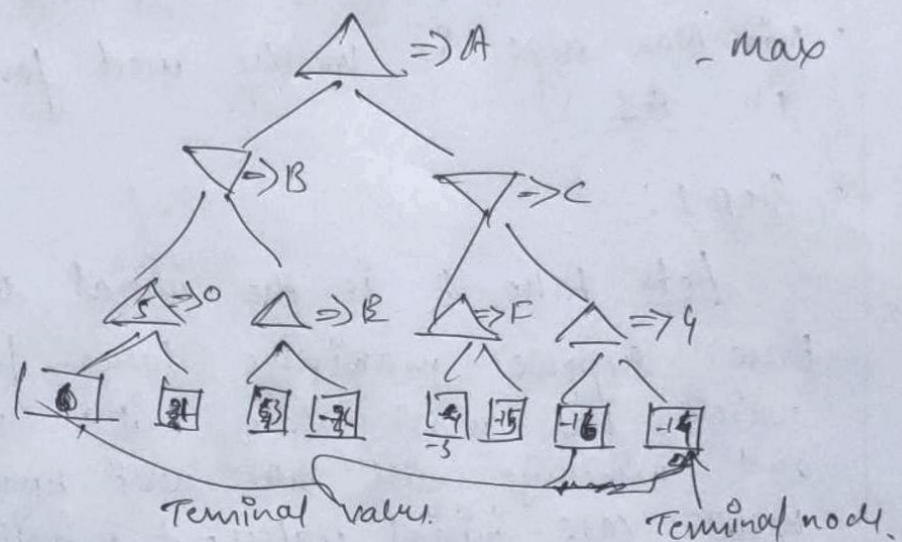
first we find the utilities value for the maximize its initial value is $-\infty$ so we will compare each value in terminal state with initial value of maximize & determines the higher value & it will find the maximum among all

For node D: $\max(5, -\infty) \Rightarrow \max(5, 1) = 6$

For node E: $\max(3, -\infty) \Rightarrow \max(3, -6) = 3$

For node F: $\max(-5, -\infty) \Rightarrow \max(-5, -15) = -5$

For node G: $\max(-16, -\infty) \Rightarrow \max(-16, -14) = -14$

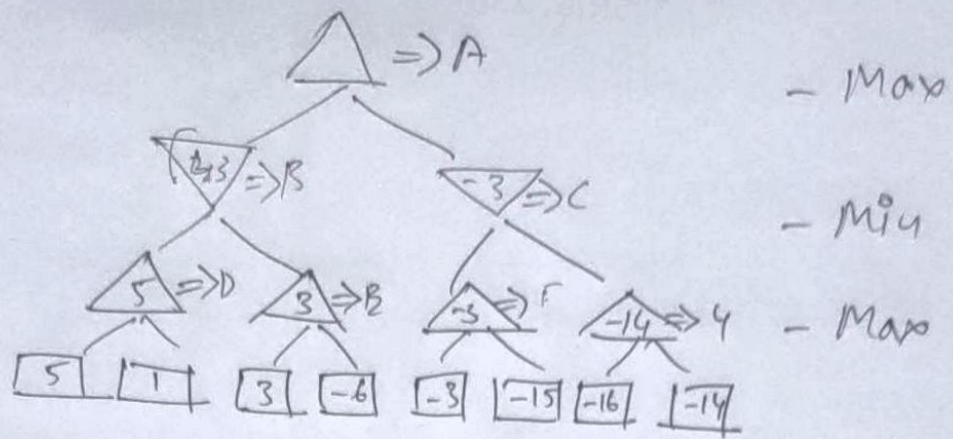


- step 3:

In the next step, it's a turn for minimize, so it will compare all nodes value with two, and will find the 2nd layer node value.

For node B: $\min(6, 3) = 3$

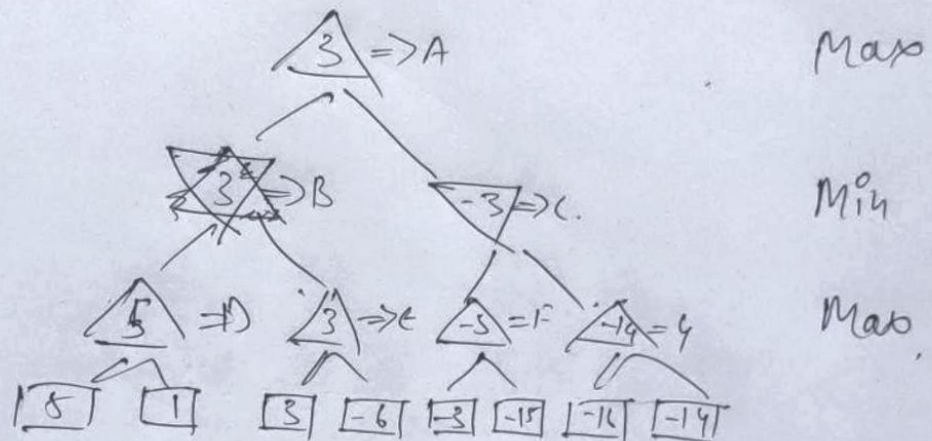
For node C: $\min(-5, -14) = -5$



- Step 4:

Now it's a turn for maximize and it will again choose the maximum of all node values & find the maximum value for the root node.

For node A: $\max(3, -3) = 3$



Hence it was the complete workflow of the minimax algorithm with two players game.