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DOP	DoA	Remark	Sign

Min - Max Algorithm

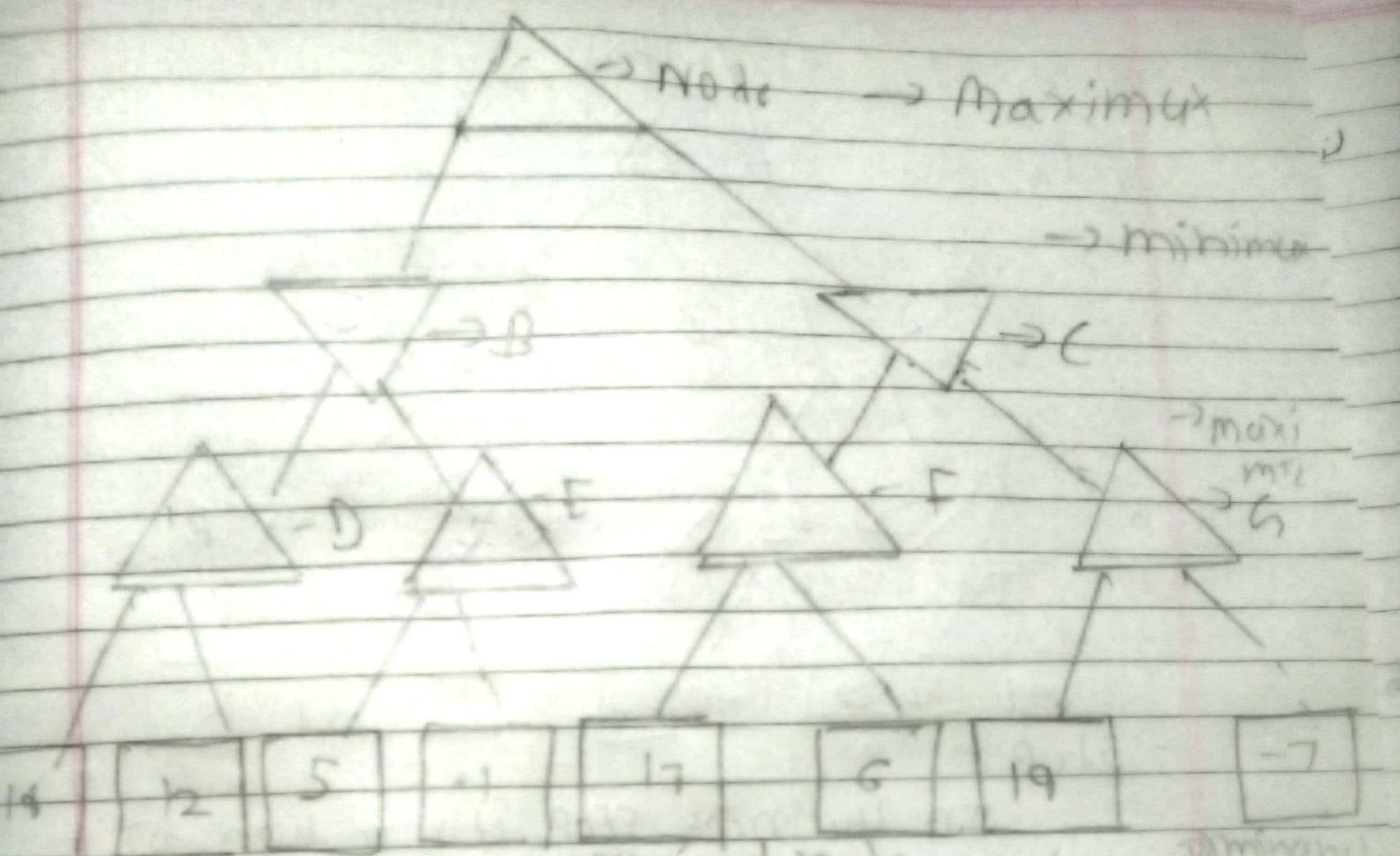
Min Max algorithm.

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 for game playing in AI.

- Step 1:

Let's take P is the initial state of the tree. Suppose maximizer takes first turn (when ∞) which has worst first initial value $= -\text{initially}$ and minimum will take next turn which has worst-case initial value $= +\text{infinity}$.



- step 2: terminal node

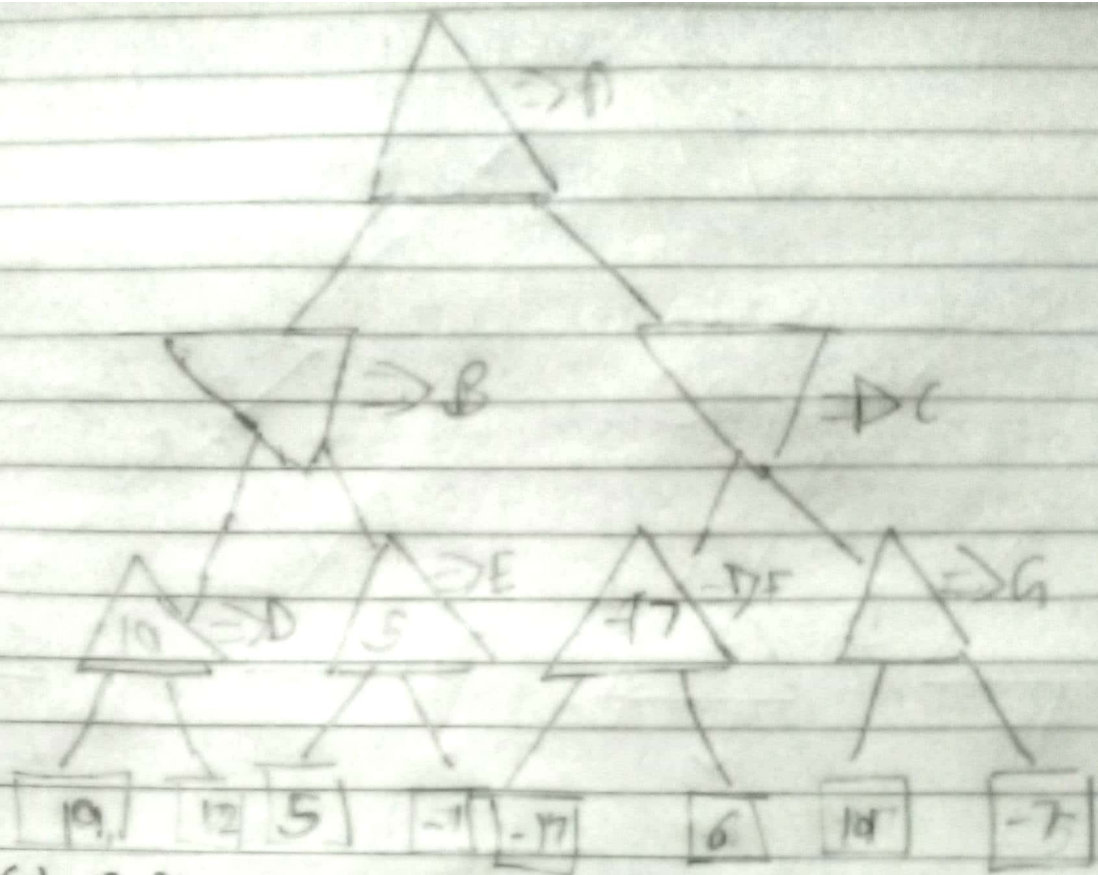
first we find the utilities value for the maximizer. its initial is $-\infty$, so we will compare each value in terminal state with initial value of maximizer and determining the higher node values, it will find the minimum among all

$$\text{For node D: } \max(19, -\infty) \Rightarrow \max(19, 12) = 19$$

$$\text{For node E: } \max(5, -\infty) \Rightarrow \max(5, -1) = 5$$

$$\text{For node F: } \max(-17, -\infty) \Rightarrow \max(-17, 6) = -17$$

$$\text{For node G: } \max(19, -\infty) \Rightarrow \max(19, -7) = 19$$

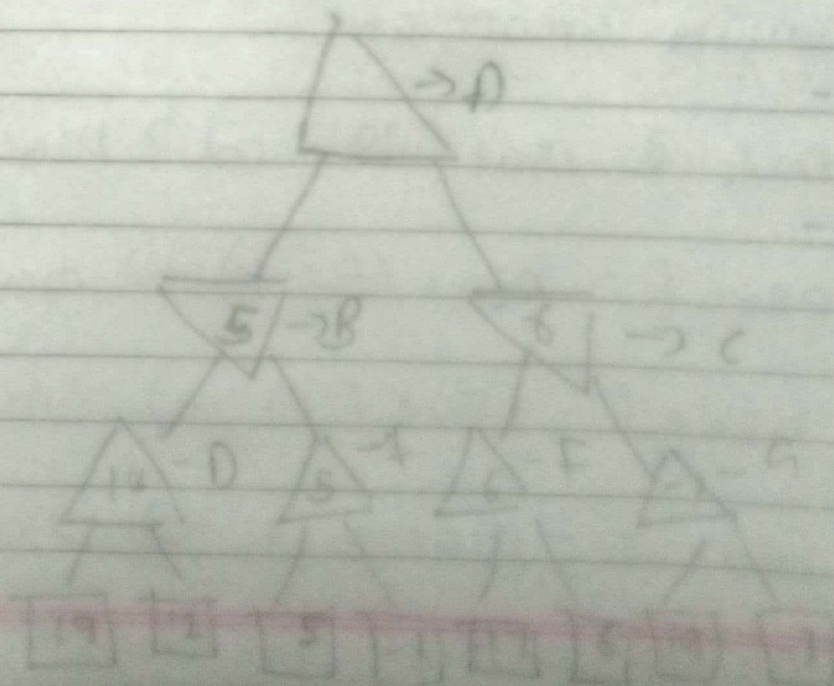


- Step 3:

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

$$\text{For node B} = \min(19, 5) = 5$$

$$\text{For node C} = \min(6, 18) = 6$$



- maximize

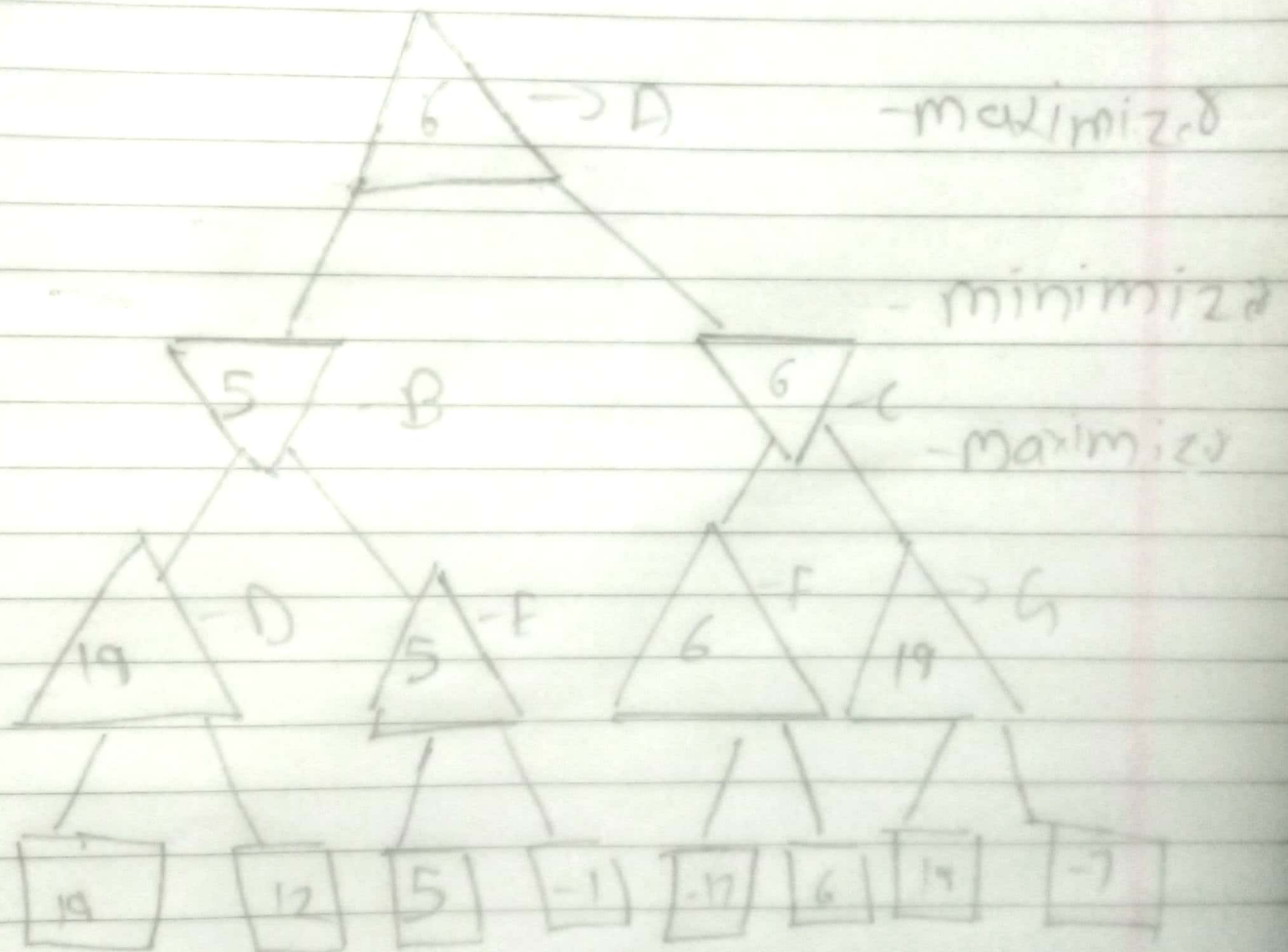
- minimize

maximize

Step 4:

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

for node A : $\max(5, 6) = 5$



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