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Answer to the question no: 1

My id last two digit: 07 $\xrightarrow{\text{binary}}$ 0111

0000|0111
0000|0000

~~0001|0000~~ ~~000|0000~~ ~~crossover~~

00000000
00000111 > crossover

Answer to the question no: 2

$T_1 = (07 \% 4) + 3 = 6$

$T_2 = (07 \% 7) + 4 = 4$

$T_3 = (07 \% 3) + 2 = 3$

$T_4 = (07 \% 8) + 1 = 8$

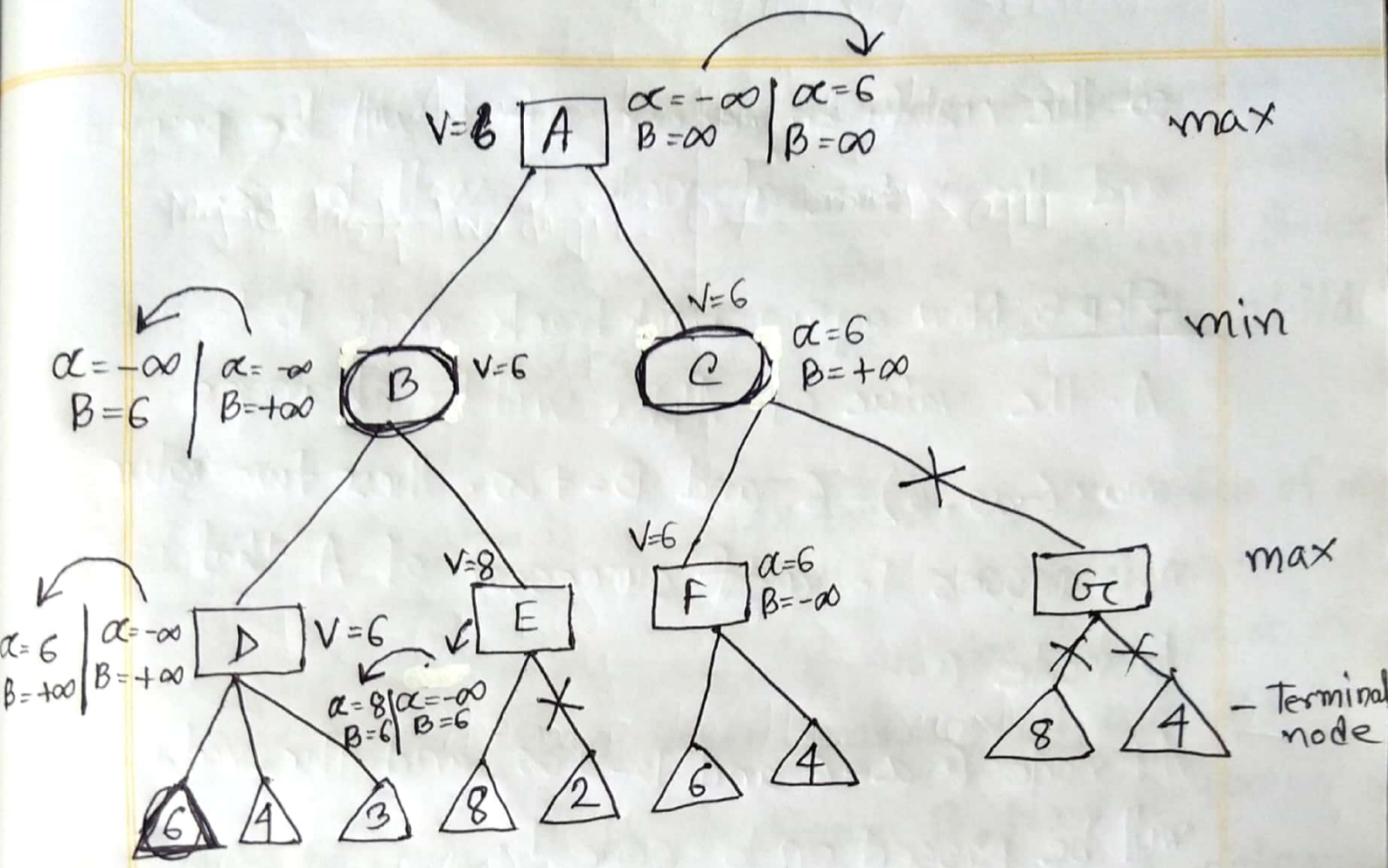
$T_5 = (07 \% 6) + 1 = 2$

$T_6 = (07 \% 2) + 5 = 6$

$T_7 = (07 \% 5) + 2 = 4$

$T_8 = (07 \% 9) + 1 = 8$

$T_9 = T_3 + 1 = 3 + 1 = 4$



Let's assume,

$\Delta \rightarrow$ Terminal.

$\square \rightarrow$ max

$\bigcirc \rightarrow$ min

Step 1: Max will start first move from node A where $\alpha = -\infty$, $\beta = \infty$, these value of α and β passed to node B where again $\alpha = -\infty$ and $\beta = +\infty$ and Node B passes the same value to its child D.

Step-2: At node D, it's MAX turn, so the value of α will be compared with firstly 6, then 4 and then 3. and then $\max(6, 4, 3) = 6$ will be the value of α at node D and node value will also be 6.

Step-3 Next backtrack to Node B. Now $\beta = +\infty$ will compare with the available subsequent nodes value, i.e $\min(\infty, 6) = 6$, so at node B the value of $\alpha = -\infty$, and $\beta = 6$.

Step-4: Now next successor is Node E and the value of $\alpha = -\infty$ and $\beta = 6$ will also be passed to node E.

At node E, it's max turn and current value of α will be compared with left child (8). so $\max(-\infty, 8) = 8$ so at E node $\alpha = 8$ and $\beta = 6$

Here, $\alpha \geq \beta$.

so the right successor of E will be pruned. and the value at node E will be 8.

Step-5: Now again back-track node B to node A. the value of Alpha will be changed. $\max(-\infty, 6) = 6$ and $B = +\infty$. these two value now passes to right successor of A that is to node C.

At node C $\alpha = 6$ and $B = +\infty$ and the values will be passed on to node F.

Step-6: At node F, again the value of α will be compared with left child which is 6. and $\max(6,6) = 6$ and then compared with right child which is 4 and $\max(6,4) = 6$. Still α remains 6 and the node value will become 6 at node F.

Step-7: Node F return the node value 6 to node C, at C $\alpha = 6$ and $B = +\infty$. As it's min, value of B will be change $\min(\infty, 6) = 6$

Now at C, $\alpha = 6$ and $\beta = 6$. and again it satisfies the condition $\alpha >= \beta$, so the right child of C which is G will be pruned. So, the algorithm will not compute the entire sub-tree G.

Step-8: Now, C returns the value of 6 to A. Here A is max so $\max(6,6) = 6$.

The final game tree is showing the nodes which are computed and which has never computed.

Thus, the optimal value for the maximizer is 6 for this example.