

Topics to discuss

Solve $T(n) = \begin{cases} 1 & , n=0 \\ 2T(n-1) + 1 & , n>0 \end{cases}$

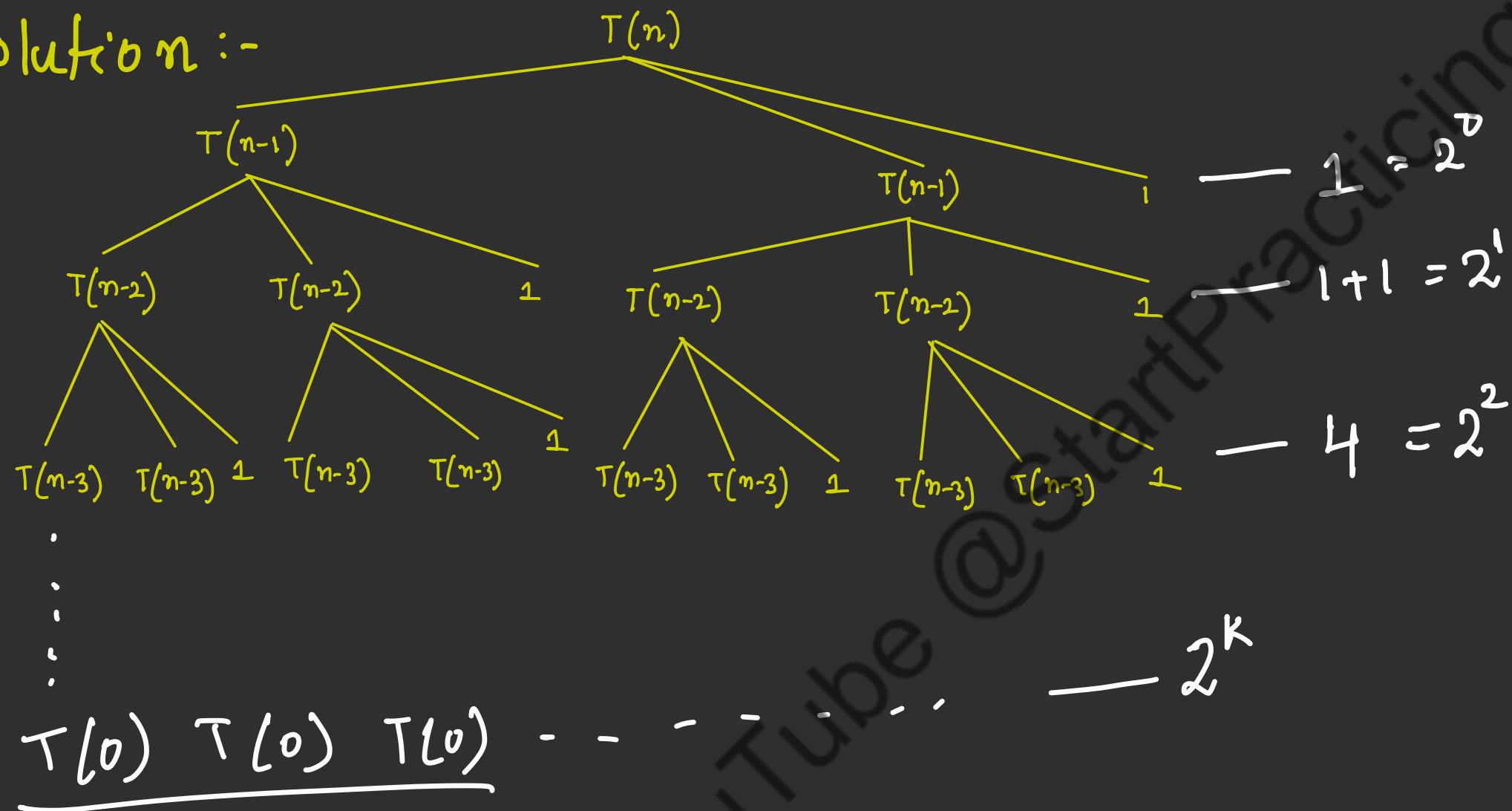
by Recursion Tree Method

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Solve $T(n) = \begin{cases} 1 & , n=0 \\ 2T(n-1) + 1 & , n>0 \end{cases}$

$$T(n) = 1, n = 0$$
$$T(0) = 1$$

Solution :-



Assume, $n - k = 0$

$$n = k$$

$$\Rightarrow k = n$$

$$\begin{aligned} T.C &= 2^0 + 2^1 + 2^2 + \dots + 2^n \\ &= \frac{2^0 (2^{n+1} - 1)}{2 - 1} \end{aligned}$$

$$T.C = 2^{n+1} - 1$$

$$T.C = O(2^n)$$

$$S_{GP} = \frac{a(x^n - 1)}{x - 1}$$

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