

Topics to discuss

Solve $T(n) = \begin{cases} 2T\left(\frac{n}{2}\right) + n & , n > 1 \\ 1 & , n = 1 \end{cases}$

by Recursion Tree Method

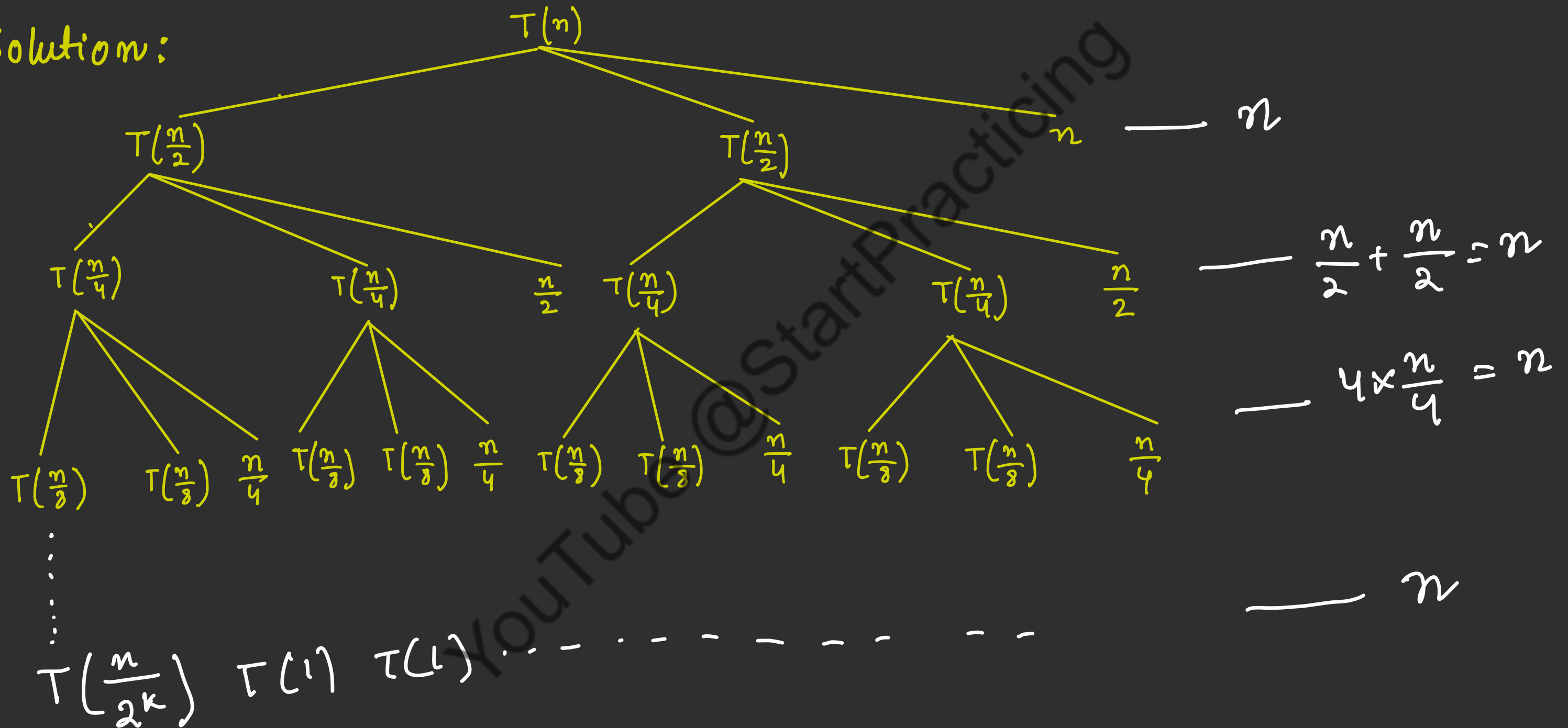
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$$\text{Solve } T(n) = \begin{cases} 2T(\frac{n}{2}) + n & , n > 1 \\ 1 & , n = 1 \end{cases}$$

$$T(n) = 1 \quad ; \quad n = 1$$

$$T(1) = 1$$

Solution:



assume,

$$\frac{n}{2^k} = 1$$

$$n = 2^k$$

$$\log_2 n = k \log_2 2$$

$$k = \log n$$

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

$$= O(n \log n)$$

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