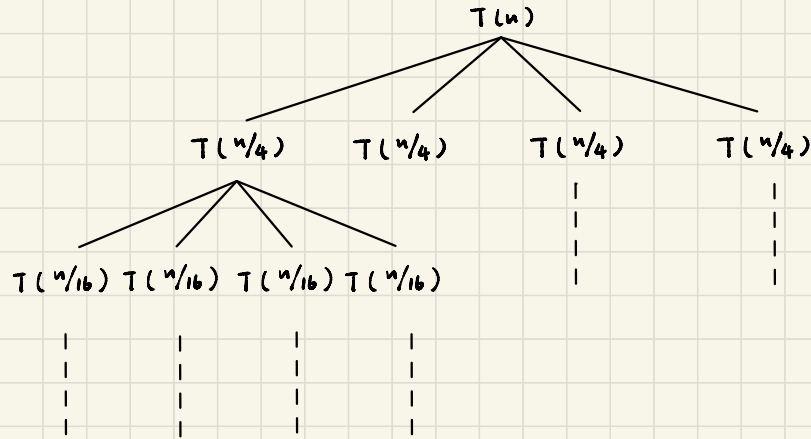


A)

$$T(n) \leq 4T(n/4) + O(n)$$



$$\begin{aligned} T(n) &\geq (n + n + n + \dots + n) \cdot \log_4 n \\ &\geq C \cdot n \cdot \log_4 n \\ &\geq O(n \log n) \end{aligned}$$

$$\text{level 1} = C \cdot n$$

$$\text{level 2} = 4 \cdot n/4 = C \cdot n$$

$$\text{level 3} = 16 \cdot n/16 = C \cdot n$$

$$\text{depth of tree} = \log_4 n$$