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The time complexity of our algorithm will be $O(\log^2 N)$, because at each step n is divide by 2 and j is multiplied by ~~to~~ 2. So for each we have $\log_2 N \Rightarrow \log_2 N * \log_2 N = \log^2 N$.

$$T(n) = \begin{cases} 1 \\ T(\frac{n}{2}) + 1 \end{cases}$$