# Challenge 1 – Proof by Induction

Prove by induction that

when n is an exact power of 2, the solution of the recurrence

$$T(n) = \begin{cases} 2 & if\ n = 2, \\ 2T\left(\dfrac{n}{2}\right) + n & if\ n = 2^k, for\ k > 1 \end{cases}$$

is $T(n) = n\ lg\ n$.