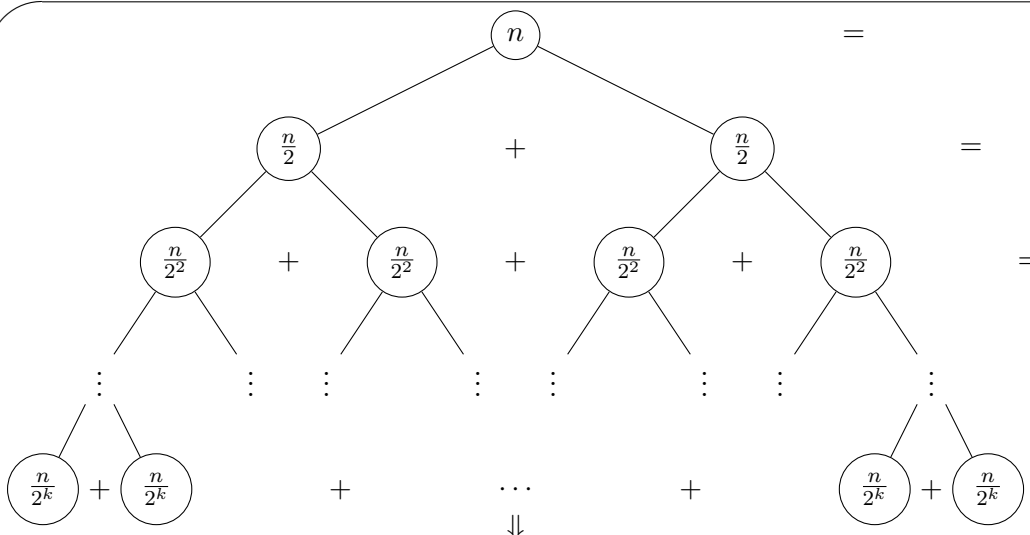

$$= O_0(n)$$
$$+$$
$$= O_1(n)$$
$$+$$
$$= O_2(n)$$
$$+$$
$$\cdots$$
$$\vdots$$
$$+$$
$$= O_{k=\lg n}(n)$$
$$=$$

$$\Downarrow$$

$$O\left(\sum_{i=0}^{k} 2^i \cdot \frac{n}{2^i}\right) = O\left(\sum_{i=0}^{k} n\right) = O(k \cdot n) \Leftrightarrow O(n \cdot \lg n)$$