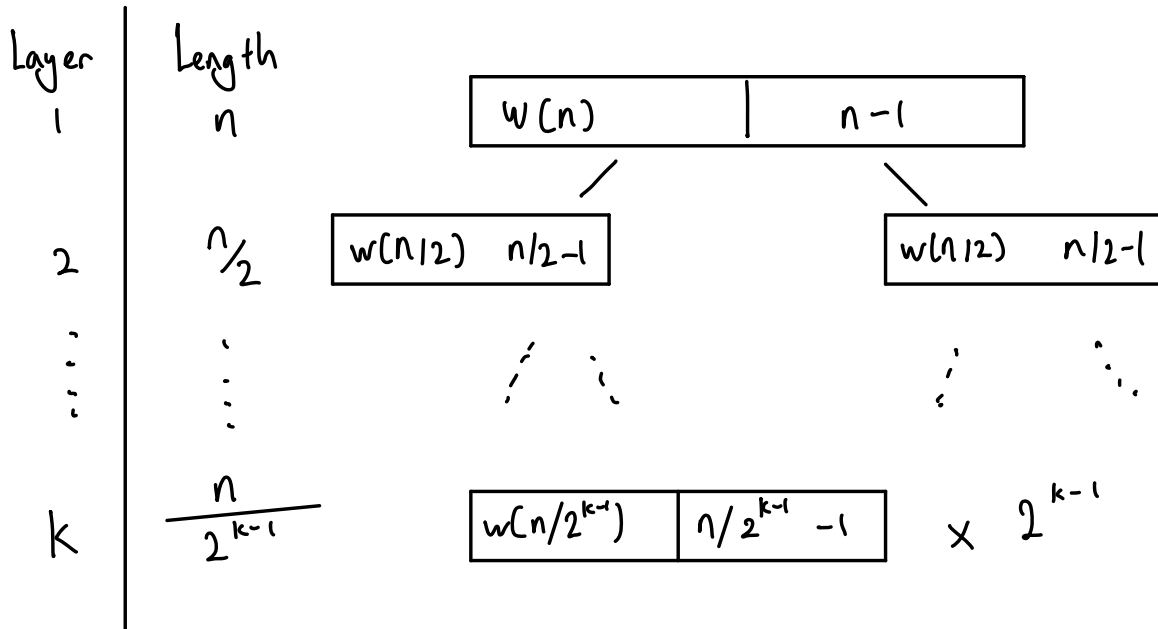


Complexity of hybrid sort

S = optimal value

N = length of array



if we stop when length = S :

$$\frac{n}{2^{k-1}} = S \quad - (1)$$

$$\frac{n}{S} = 2^{k-1} \quad - (2)$$

$$\log \frac{n}{S} = k-1$$

$$k = \log \frac{n}{S} + 1 \quad - (3)$$

Hence, we will stop at layer $\log \frac{n}{s} + 1$.

At the layer we stop at, there are 2^{k-1} array.
where each of them length is $\frac{n}{2^{k-1}}$

Hence, complexity of hybrid sort :

$$\begin{aligned} & n \left(\log \frac{n}{s} + 1 \right) + (2^{k-1}) \left(\frac{n}{2^{k-1}} \right)^2 \\ = & n \left(\log \frac{n}{s} + 1 \right) + \left(\frac{n}{s} \right) (s)^2 \\ = & n \left(\log \frac{n}{s} + 1 \right) + ns \quad // \end{aligned}$$