Resolução da Recorrência

$$T(n) = 2T(n/2) + 1$$
$$T(1) = 1$$

$$T(n) = 2T(n/2) + 1 \qquad \mathrm{i} = 1$$

$$2.\ T(n/2) = 2.\,2T(n/4) + 1.2 \qquad i = 2$$

$$4.\ T(n/4) = 4.\,2T(n/8) + 1.4 \qquad i = 3$$

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$$2^{k-1}.T(2) = 2^{k-1}.2T(1) + 1.2^{k-1} \qquad i = \log n$$

$$2^k.T(1) = 2^k.1$$

Genericamente, tem-se:

$$T\left(\frac{n}{2^{k-1}}\right) = 2\,T\left(\frac{n}{2^k}\right) + 1$$

Para $T(2) = \frac{n}{2^{k-1}} = 2 \ \Rightarrow\ a = 2^k \ \Rightarrow\ k = log\, n$

Somando:

$$T(n) = 2^k + \sum_{j=0}^{k} 2^j - 1$$

$$k = \log n \ \Rightarrow\ T(n) = n + \sum_{i=0}^{\log n - 1} 2^i - 1$$

$$n + 2^{\log n} - 2 - 1$$

$$2n - 3$$