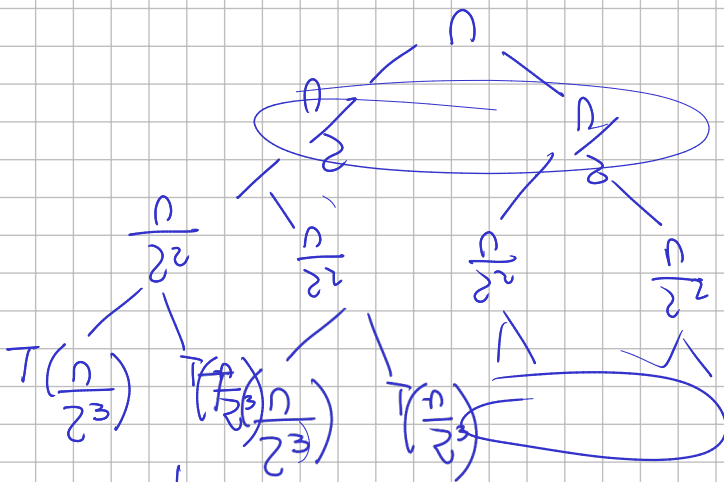
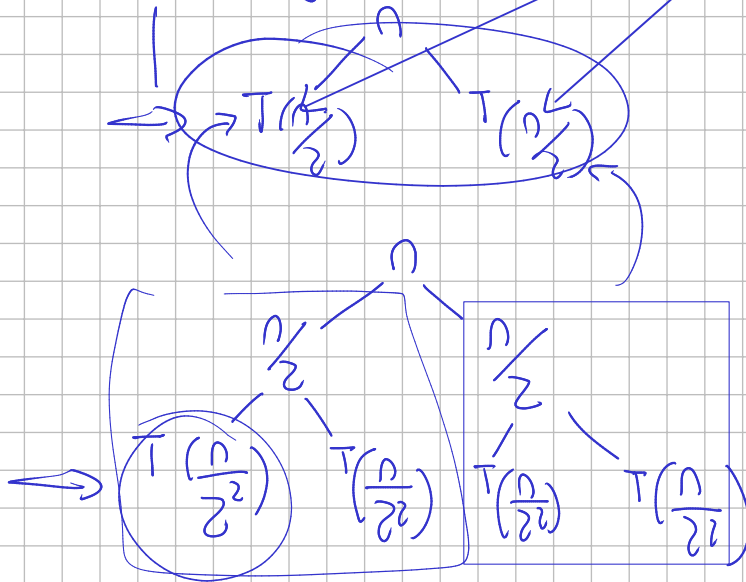


$$T(n) = cT(n/2) + f(n)$$

Divide y vencerás

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

$$T(n/2) = 2T(n/2^2) + \frac{n}{2}$$



$$T\left(\frac{n}{2^i}\right)$$

$$T(1) = O(1)$$

0	n
1	n
2	n
3	n

$$O(1) = c$$

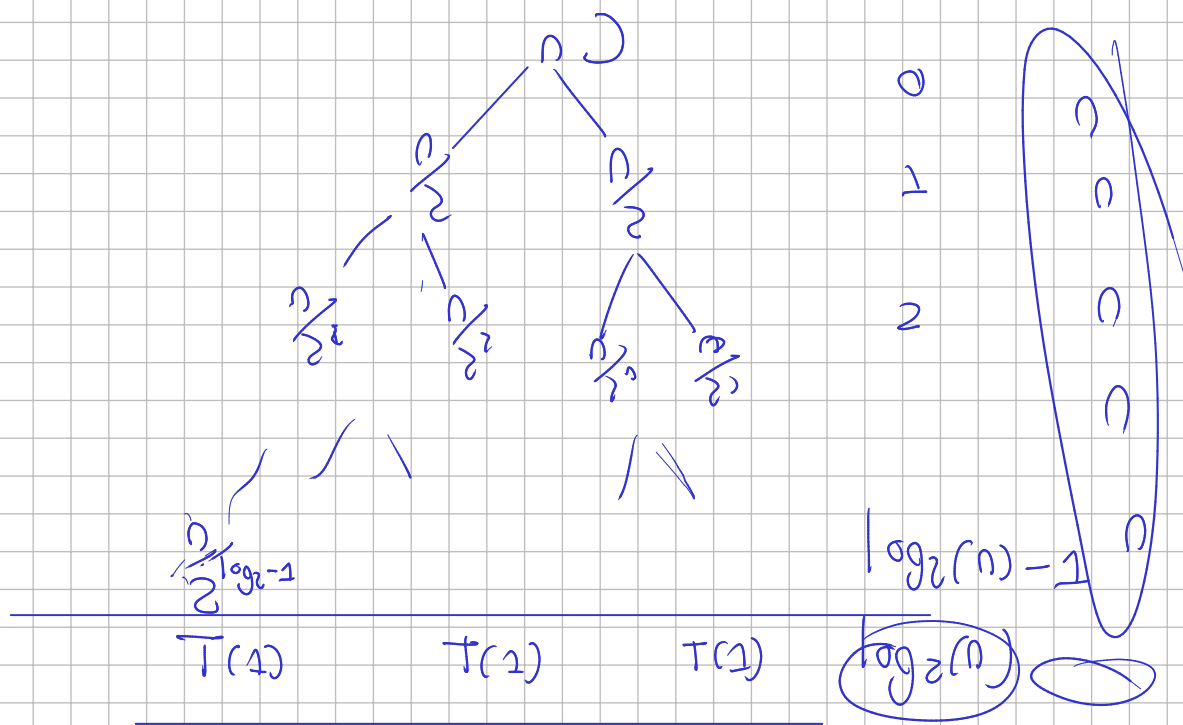
$$\log_2(n)$$

$$\frac{n}{2^i} = 1$$

$$n = 2^i$$

$$\log_2(n) = \log_2(2^i)$$

$$\log_2(n) = i$$



$$T(n) = \sum_{i=1}^{\log_2(n)-1} n + T(1) \times 2^{\log_2(n)}$$

Below the equation, a small tree diagram shows a root node $\frac{n}{2^{\log_2(n)-1}}$ branching into two children, both labeled $T(1)$. The $T(1)$ node is circled.

$$T(n) = n(\log_2(n) - 1) + T(1)n$$

$$T(n) = n \log_2(n) - n + C \times n$$

$$O(n \log_2(n))$$

Dado $T(n) = aT(n/b) + f(n)$, donde $a \geq 1, b > 1$, se puede acotar asintóticamente como sigue:

1. $T(n) = \Theta(n^{\log_b a})$

Si $f(n) = O(n^{\log_b a - \varepsilon})$ para algún $\varepsilon > 0$

2. $T(n) = \Theta(n^{\log_b a} \lg n)$

Si $f(n) = \Theta(n^{\log_b a})$ para algún $\varepsilon > 0$

3. $T(n) = \Theta(f(n))$

Si $f(n) = \Omega(n^{\log_b a + \varepsilon})$ para algún $\varepsilon > 0$ y si $af(n/b) \leq cf(n)$ para algún $c < 1$

$$T(n) = 2T\left(\frac{n}{2}\right) + n \quad a=2 \quad b=2 \quad f(n)=n$$

1) n es $O(n^{\log_2 2 - \varepsilon})$

n es $O(n^{1-\varepsilon})$

$\varepsilon > 0$ ✗

2) n es $\Theta(n^{\log_2 2})$

n es $\Theta(n)$

$\Theta(n^{\log_2 2} \lg n)$

$\Theta(n \lg n)$

$T(n/2) + 1$

$T(2) = 1$

