Time Complexity Analysis 🤔

[2 , 10] : 6 ,
[8 , 12] : 8-4=4
[9 , 11] : 9-4
[9 , 9] : 9-9=0
inclusive
& excluded
[9 , 8] : 8-4=-1

$\log_2 100 = 2 \quad \log_{10} 100 = 2$

$\log_2 n^k = k \log_2 n$

$\log_2 n^k = \log_{10} n^k$

x range → 100,000,000
y range → ∞

2 × 10^8

for func(for n){

for i=1; i<n; i++{ func(n-1); }

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

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

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

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

$T(n) = 2T(n-3) + n$

$T(n) = 2T(n-k) + n$

$T(n) = 2^k T(n-k) + k2^k$

$n - k = 1$

$k = n-1$

$2^k T(1) + k2^k$

$2^{n-1} T(1) + (n-1)2^{n-1}$

$2^{n-1}(T(1) + n - 1)$

$2^{n-1}(1 + n - 1)$

$2^{n-1} \cdot n$

2^n

$\frac{2^n}{2}$

$\frac{2^n}{2^2}$

$\frac{2^n}{2^k}$

$\frac{2^n}{2^{n-1}}$

$\frac{2^n}{2^n}$

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

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