PREGUNTA ①

FUNCIÓN ALGORITMO (n)

```
Cont ← 2^n ——— 1 → O(1)
for ← 1 to n do ——— n veces
    S ← Cont ——— 1 → O(1)
    while S > 1 do
        S ← S/2 ——— log2(2^n) = n veces
    end while                O(n²)
end for
return S
```

$t(n) = n \cdot O(n) = O(n^2)$

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PREGUNTA ②

$t(n) = 2T(\frac{n}{2}) + n, \quad T(1) = 1$

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

$t(\frac{n}{2}) = 2t(\frac{n}{4}) + \frac{n}{2}$

$t(n) = 2[2t(\frac{n}{4}) + \frac{n}{2}] + n$

$t(n) = 4t(\frac{n}{4}) + 2n$

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$t(n) = 8t(\frac{n}{8}) + 3n$

$\vdots$

$t(n) = 2^k t(\frac{n}{2^k}) + kn$

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

$n = 2^k$

$\log n = k$

$t(n) = 2^k t(1) + \log n \cdot n$

$t(n) = n \cdot 1 + n \log n$

$t(n) = O(n \log n)$

$O(F(n)) = O(n \log n)$