Estructuras de datos
2024-06-11

Matrices esparcidas

¡Buenos días!

$$T(N) = \cancel{T(asig)} + T(for_x) + \cancel{T(ret)} = 2t + \cancel{T(ini_x)} + v_x\left(\cancel{T(cond_x)} + T(cuerpo_x) + \cancel{T(fin_x)}\right)$$

$$= \cancel{3t + t} + v_x\left(2t + \cancel{T(asig)} + T(for_y) + \cancel{T(asig)}\right)$$

$$= 3t + v_x\left(4t + \cancel{T(ini_y)} + v_y\left(\cancel{T(cond_y)} + \cancel{T(cuerpo_y)} + \cancel{T(fin_y)}\right)\right)$$

$$= 3t + v_x\left(5t + v_y(3t)\right) = 3t + 5v_x t + 3v_x v_y t$$

$$v_x = ? = K$$

$$v_y = ? = K-1$$

$$= 3t + 5Kt + 3K(K-1)t = 3t + 5Kt + 3K^2 - 3Kt$$

$$T(N) = 3 + 2K + 3K^2$$

$$\Rightarrow O(N) = O(3 + 2K + 3K^2)$$

* R. suma

$$= \max\left(O(3), O(2K), O(3K^2)\right) = O(3K^2)$$

* R. constantes

$O(N) = K^2$ constante #

$$\Rightarrow O(N) = K$$

$$
\begin{aligned}
Loc(A[i_1, i_2, \ldots, i_k]) = \alpha + \; & (i_1 - n_1)(m_2 - n_2 + 1)(m_3 - n_3 + 1) \ldots (m_{k-1} - n_{k-1} + 1)(m_k - n_k + 1) \\
+ \; & (i_2 - n_2)(m_3 - n_3 + 1) \ldots (m_{k-1} - n_{k-1} + 1)(m_k - n_k + 1) \\
+ \; & \vdots \\
+ \; & (i_{k-1} - n_{k-1})(m_{k-1} - n_{k-1} + 1)(m_k - n_k + 1) \\
+ \; & (i_k - n_k)(1)
\end{aligned}
$$

$$T(N) = \cancel{T(asig)} + \cancel{T(asig)} + T(for_x) + \cancel{T(ret)}$$

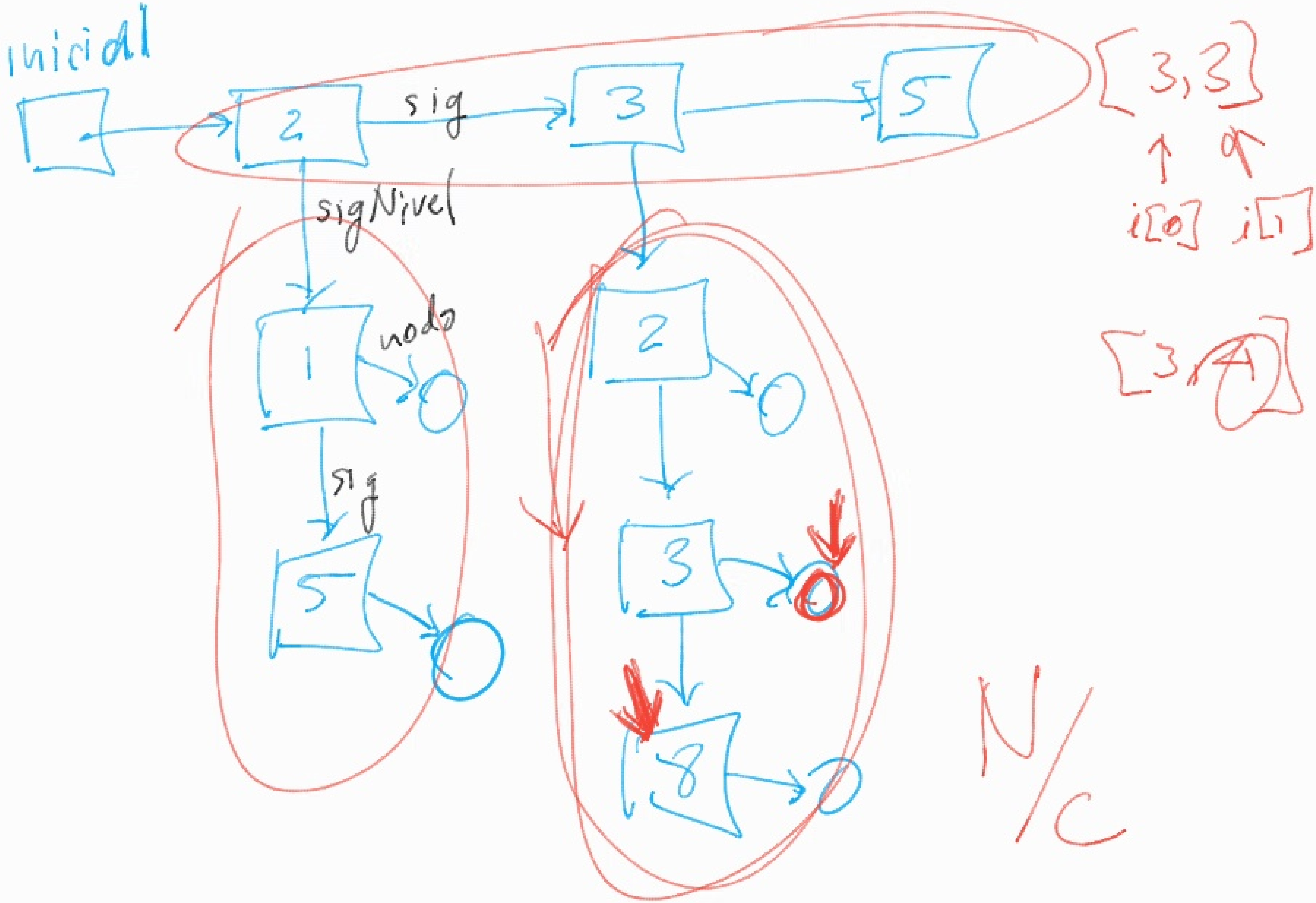
$$= 3t + \cancel{T(ini_x)} + v_x \left(\cancel{T(cond_x)} + T(cuerpo_x) + \cancel{T(fin_x)} \right)$$

$$= 4t + v_x \left(2t + \cancel{T(asig)} + \cancel{T(asig)} \right) = 4t + v_x\, 4t$$

$$v_x = K - 1$$

$$\Rightarrow T(N) = 4t + (K-1)4t = \cancel{4t} + 4Kt - \cancel{4t} = 4K$$

$$O(4K) = K \;//$$


inicial
2
sig
3
5
sigNivel
1
nodo
sig
5
2
3
8
[3, 3]
i[0]
i[1]
[3, 4]
N/C

[1..1 # 1..100]

[1, 100]

$$T(N) = T(\cancel{asig}) + T(for) + T(\cancel{asig}) + T(\cancel{ret}) = 3t + T(\cancel{ini}) + v\left(T(\cancel{cond}) + T(cuerpo) + \cancel{T(fin)}\right)$$

$$= 4t + v\left(2t + T(\cancel{asig}) + T(while) + T(if)\right)$$

$$= 4t + v\left(3t + v_w\left(T(\cancel{cond_w}) + T(\cancel{cuerpo_w})\right) + T(\cancel{cond_{if}}) + \max\left(\cancel{T(t)}, \cancel{T(e)}\right)\right)$$

$$= 3t + v\left(3t + 4 v_w t\right)$$

$$T(N) = 3 + 3v + 4 v v_w$$

$$v = K$$

$$v_w = N/c$$

$$\Rightarrow T(N)\ 3 + 3K + 4KN = \boxed{O(N) = KN/c}$$

sublineal.