$$\begin{cases} \dfrac{\partial C}{\partial t} = D\dfrac{\partial^2 C}{\partial x^2} \\ C(x,0) = C_0 \\ C(L,t) = C_s \\ \dfrac{\partial C(0,t)}{\partial x} = 0 \end{cases}$$

$$\left.\frac{dy(x)}{dx}\right|_{x_i} \cong \frac{y(x_i+\Delta x) - y(x_i-\Delta x)}{2\cdot\Delta x}$$

$$\left.\frac{d^2y(x)}{dx^2}\right|_{x_i} \cong \frac{y(x_i+\Delta x) - 2\cdot y(x_i) + y(x_i-\Delta x)}{(\Delta x)^2}$$ — x_i indo de x_1 a x_N

$$\left.\frac{dy(x)}{dx}\right|_{x=x_0=0} \cong \frac{1}{\Delta x}\left(-\frac{3}{2}\cdot y_0 + 2\cdot y_1 - \frac{1}{2}y_2\right)$$

$$\left.\frac{dy(x)}{dx}\right|_{x=x_n=1} \cong \frac{1}{\Delta x}\cdot\left(\frac{1}{2}\cdot y_{n-2} - 2\cdot y_{n-1} + \frac{3}{2}\cdot y_n\right)$$

$$\left.\frac{\partial c}{\partial x}\right|_{x=0} = \frac{1}{\Delta x}\left(-\frac{3}{2}C_0 + 2C_1 - \frac{1}{2}C_2\right) = 0 \rightarrow -\frac{3}{2}C_0 = \frac{C_2}{2} - 2C_1 \rightarrow C_0 = \frac{4C_1}{3} - \frac{C_2}{3}$$

$$C_{N+1} = C_s$$

$$C(x_i,0) = C_i(0) = C_{i_0} = C_0$$

$$\hookrightarrow \boxed{C(x_i,0) = C_0}$$

$$\boxed{\text{Sistema de EDO's} \begin{cases} \dfrac{dC_1}{dt} = \dfrac{D}{(\Delta x)^2}\left(C_2 - 2C_1 + \dfrac{4C_1}{3} - \dfrac{C_2}{3}\right) \\ \text{FOR } i = 2:n-1 \\ \quad \dfrac{dC_i}{dt} = \dfrac{D}{(\Delta x)^2}\left(C_{i+1} - 2C_i + C_{i-1}\right) \\ \text{end} \\ \dfrac{dC_N}{dt} = \dfrac{D}{(\Delta x)^2}\left(C_s - 2C_N + C_{N-1}\right) \end{cases}}$$