EJERCICIO 07

- $\frac{\partial^2 u}{\partial t^2} = \alpha^2 \frac{\partial^2 u}{\partial x^2}$ * $\lambda = \frac{\alpha \Delta t}{\Delta x}$

$$\Rightarrow \quad u_i^{l+1} - 2u_i^l + u_i^{l-1} = \frac{\alpha^2 (\Delta t)^2}{(\Delta x)^2} \left[u_{i+1}^l - 2u_i^l + u_{i-1}^l \right]$$

* $u_{i\pm1}^l = e^{\pm jK\Delta x} u_i^l$

* $u_i^{l\pm i} = e^{\pm i\omega\Delta t} u_i^l$

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=> [redacted] -

$$\Rightarrow \quad u_i^{l+1} = 2\left[1-\lambda^2\right] u_i^l + \lambda^2 \left[u_{i+1}^l + u_{i-1}^l\right] - u_i^{l-1}$$

$$\Rightarrow \quad e^{j\omega\Delta t} u_i^l = 2\left[1-\lambda^2\right] u_i^l + \lambda^2 u_i^l \left[e^{jK\Delta x} + e^{-jK\Delta x}\right] - u_i^l e^{-j\omega\Delta t}$$

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