$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} + u\frac{\partial u}{\partial y} = \nu\frac{\partial^2 u}{\partial x^2} + \nu\frac{\partial^2 u}{\partial y^2}$$

$$\frac{\partial u}{\partial t} = -u\left[\frac{\partial u}{\partial x} + u\frac{\partial u}{\partial y}\right] + \nu\left[\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right]$$

$$\frac{u_{ij}^{t+1} - u_{ij}^{t}}{\Delta t} = -u_{ij}^{t}\left[\frac{u_{i+1,j}^{t} - u_{i-1,j}^{t} + u_{i,j+1}^{t} - u_{i,j-1}^{t}}{2\Delta x}\right] + \nu\left[\frac{u_{i+1,j}^{t} - 2u_{ij}^{t} + u_{i-1,j}^{t} - 2u_{i,j+1}^{t} + u_{i,j-1}^{t}}{\Delta x^2}\right]$$

despejamos u_{ij}^{t+1}

$$\star\ u_{ij}^{t+1} = u_{ij}^{t} + \Delta t\left[\nu\frac{(u_{i+1,j}^{t} - 2u_{ij}^{t} + u_{i-1,j}^{t} + u_{i,j-1}^{t} - 2u_{ij}^{t} + u_{ij-1}^{t})}{\Delta x^2} - u_{ij}^{t}\frac{(u_{i+1,j}^{t} - u_{i-1,j}^{t})}{2\Delta x} - u_{ij}^{t}\frac{(u_{ij+1}^{t} - u_{ij-1}^{t})}{2\Delta x}\right]$$