$$\nabla^2\phi = 0 \Rightarrow \frac{\partial^2\phi}{\partial x^2} + \frac{\partial^2\phi}{\partial y^2} = 0$$

$$\Rightarrow \frac{\phi_{j-1}^{n} - 2\phi_j^n + \phi_{j+1}^n}{\Delta x^2} + \frac{\phi_j^{n-1} - 2\phi_j^n + \phi_j^{n+1}}{\Delta y^2} = 0$$

let $\Delta x = \Delta y$

$$\Rightarrow \frac{1}{\Delta x^2}\left(\phi_{j-1}^n + \phi_{j+1}^n + \phi_j^{n-1} + \phi_j^{n+1} - 4\phi_j^n\right) = 0$$

$$\left(\phi_{j-1}^n + \phi_{j+1}^n + \phi_j^{n-1} + \phi_j^{n+1}\right) = 4\phi_j^n$$

$$\phi_j^n = \frac{1}{4}\left(\phi_{j-1}^n + \phi_{j+1}^n + \phi_j^{n-1} + \phi_j^{n+1}\right)$$

Finite Diffrence Method