Imaginary time propagation by code

- 1) Key idea: to apply decay operator on any given unrefunction again and again such that all excited state are suppressed exponentially faster and we are left with ground state.
- Harmonic oscillator potential $V(x) = \pm mw^2 x^2$

We choose m=1 and w=1

3 Schrödinger equation

$$\left(-\frac{h^2}{2m}\nabla_x^2 + V(x)\right)\Psi(x) = E\Psi(x)$$

Step &

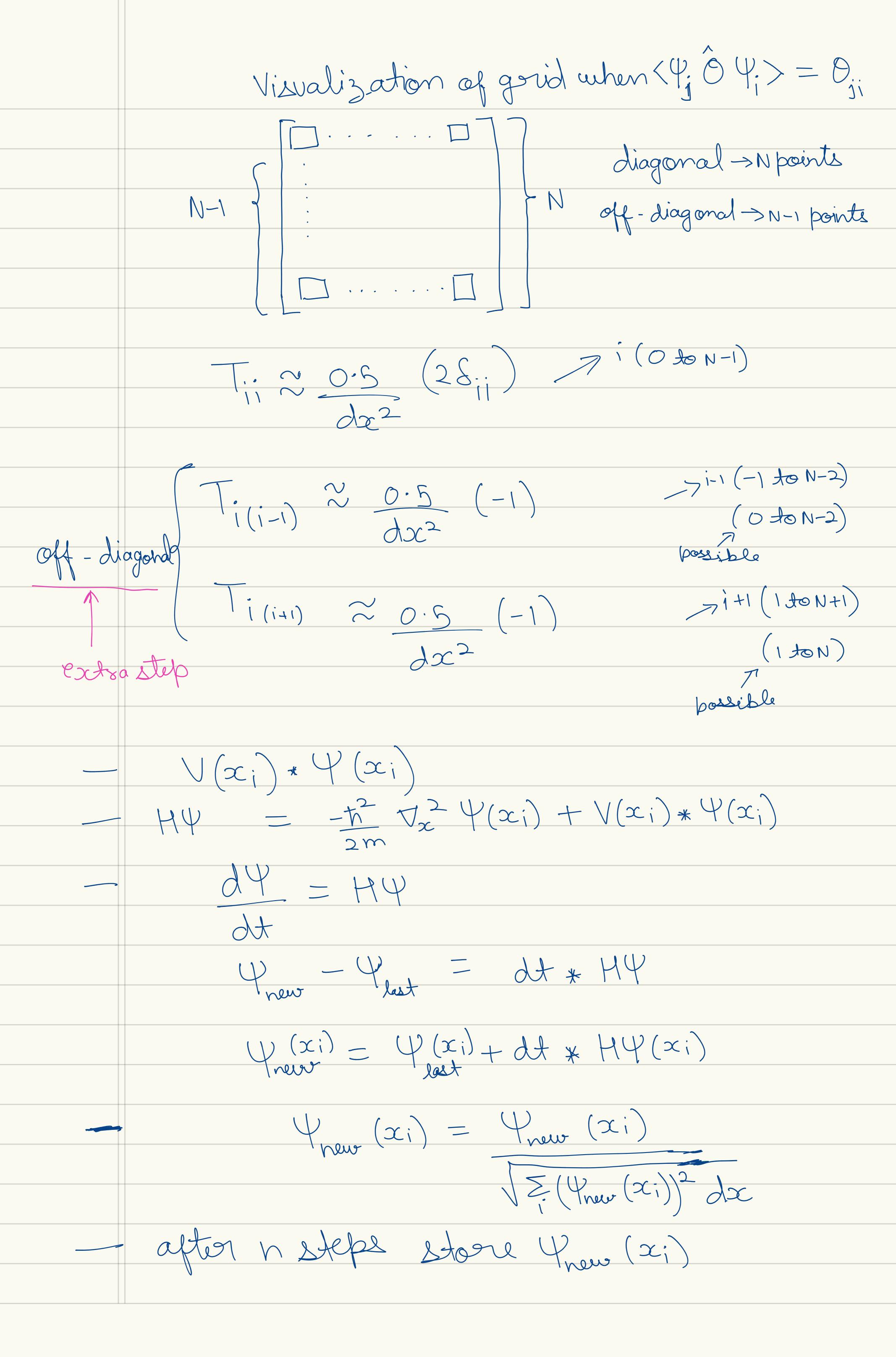
Setup goid X-min, X-max, dx

1 sight boundary

point

point

 $\int \int (x+h) = \int (x) + h + \int (x) + \frac{h^2}{2!} \int (x) + \frac{h^3}{3!} \int (x) + \dots$



One more time make HY(xi) using Ynew(xi)
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