Heat Equation Example on solving Partial Differential Equations (PDEs)

First run this MATLAB function **crank_nicolson_heat_equation** that implements the Crank-Nicolson method to numerically solve a heat equation of the form $u_t = a^2 u_{xx};$ subject to initial conditions $u0 = sin(pi * x/L);$., Spatial step size **Nx**, Temporal step size **Nt**.

Then run the example script **heat_example** after adjusting the inputs as you want.

Input Arguments in the example script:

- **Nx**: is the Spatial step size.
- **Nt**: is the Temporal step size.
- **L** : length of the domain.
- **T** : total time.
- $alpha$: Thermal diffusivity coefficient.

Output Arguments:

- **A plot of the solution.**

The Plot for the Heat Equation Example: