Introduction to CUDA Parallel Programming Homework Assignment 3
March, 2025

1. Solve the Poisson equation on a 3D lattice with boundary conditions. Consider a cube of size L x L x L with a point charge q=1 at its center (L/2, L/2, L/2), with lattice sites (0, 1, 2, …, L) in each direction, subject to the boundary conditions with potential equal to zero on its entire surface. Find the potential versus the distance r from the point charge, for L=8, 16, 32, 64 respectively.
   Does the potential approach the Coulomb's law in the limit L >>1 ?

   As usual, your homework report should include your source codes, results, and discussions. The discussion file should be prepared with a typesetting system, e.g., LaTeX, Word, etc., and it is converted to a PDF file. All files should be zipped into one gzipped tar file, with a file name containing your student number and the problem set number (e.g., r05202043_ps3.tar.gz). Please send your homework with the title "your_student_number_HW3" to twchiu@phys.ntu.edu.tw before 17:00, June 11, 2025 (deadline for all problem sets).