Introduction to CUDA Parallel Programming Homework Assignment 5
April, 2025

1. Heat Diffusion

Using a Cartesian grid of 1024 x 1024, solve for the thermal equilibrium temperature distribution on a square plate. The temperature along the top edge of the plate is at 400 K, while the remainder of the circumference is at 273 K. Write a CUDA code for multi-GPUs to solve this problem. Test your code with one and two GPUs. Also, to determine the optimal block size for this problem. The value of ω can be fixed to 1.

As usual, your homework report should include your source codes, results, and discussions (without any executable files). 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_ps5.tar.gz). Please send your homework with the title "your_student_number_HW5" to twchiu@phys.ntu.edu.tw before 17:00, June 11, 2025 (deadline for all problem sets).