Introduction to CUDA Parallel Programming Homework Assignment 4
Due 2021/04/20

1. **Dot-product**
   Write your own CUDA code for finding the dot-product of 2 real vectors with N-GPUs, which generalizes the 1-GPU code in twqcd80:/home/cuda_lecture_2021/vecDotProduct/vecDot.cu
   Test your code with 2 GPUs, using random vectors of size 40960000 elements generated by the routine RandomInit. Also, determine the optimal block size and grid size for this problem.

2. **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 *.exe 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_ps4.tar.gz). Please send your homework from your NTU email account to twchiu@phys.ntu.edu.tw before 24:00 of the due date.
If the mail server does not allow you to attach the gzipped tar file, you can put it in the home directory of your account in twqcd80, e.g.,
twqcd80:/home/r05202043/HW4/r05202043_ps4.tar.gz
and also send email notification to me.