Introduction to CUDA Parallel Programming Homework Assignment 6
April, 2025

1. Histogram of a data set with exponential distribution

Write a pseudo-random number generator to generate random numbers in $(0,\infty)$ with the exponential distribution exp(-x), and use it to generate a data set of 81920000 entries. Compare the histograms computed by CPU, GPU with global memory, and GPU with shared memory, as well as their speeds. Plot the histogram, together with the curve of the theoretical probability distribution.
Also, to determine the optimal block sizes for this problem.

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_ps6.tar.gz). Please send your homework from your NTU/NTNU/NTUST email account to twchiu@phys.ntu.edu.tw before 17:00, June 11, 2025 (deadline for all problem sets).

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 twcp1, e.g.,
twcp1:/home/cuda2025/r05202043/HW6/r05202043_ps6.tar.gz
and also send email notification to me.