Files in the tarball

chol_driver.c – initialization, kernel invocation, testing, timing, a few debugging routines
chol_kernel.cu – batched Cholesky factorization kernel
makefile – a rudimentary makefile
make.inc – system specific make settings

Compile and run the code

Modify the make.inc file to reflect the setup of your system.
Type make to compile the code.
Run the executable.
The executable requires two command line parameters: the size of the factorizations and the size of the batch. Use 32 for the size of the factorizations and 1000 for the size of the batch, i.e., invoke the executable in the following way: "./chol_exec 32 1000". The code will apply the Cholesky factorization to 1000 matrices of size 32x32.
The code reports the error and the performance in GFLOPS.
The error is the result of comparison of the GPU kernel agains LAPACK running on the CPU, and is expected to be on the order of 10^{-6}.
Your task is to improve the performance.
Note the initial performance, then try to improve it. Measure and report the performance improvement at each step. Watch the error to make sure you did not break the correctness. Only make changes in the chol_kernel.cu file.

What is expected

Send me the final version of your chol_kernel.cu file (kurzak@eecs.utk.edu) and a brief report. I will replace the initial file with your file, compile and run the code. I expect the code to pass the correctness check. I will not give any partial credit for broken code. I expect your code to be substantially faster than the initial code. Explain clearly, in your report, how you managed to improve the performance.

The deadline

The deadline for the assignment is two weeks from today plus one day, i.e., Thursday, March 12.
In case of difficulties with: access to hardware, compiling, running, understanding the assignment, get in touch with me sooner rather than later.

Have fun!
Jakub Kurzak