Homework #9 GPU Programming
Due: Friday, April 27th, before 2:00pm

GPU Programming

Download the `jacobiSS.c` code from *https://learn.colorado.edu*. *Follow the instructions in the header on how to compile and run on JANUS.*

Your homework is to run this program in parallel using the GPU nodes on JANUS. Make sure you are compiling with the –Minfo flag. This gives you information about how your program will be run in parallel. Answer the following questions.

1. Run your code in serial. How much time does it take?
2. Add the following to request the compiler to parallelize your code: `#pragma acc region`. Put this between the clock measurements. Reading the output from the compiler, which loops are going to run in parallel?
3. Run your code on the GPU node. What is the speedup when compared with the serial time?
4. From the output, what fraction of time is your code spending to initialize?
5. Run `pgcudainit &` as a background process and execute your code again. What is the speedup now?
6. Create plot showing the speedup using grid sizes of 100, 200, 400, 800, 1600 and 3200. The sizes can be added on the command line: `./jacobiSS 100`

Assignment Submission

Create a PDF of your results, any plots, answers to your questions, and be clear about any code modifications you made inside the PDF. Please work alone on this assignment. Submit this file to the d2L site by the due date.

That's it!