Programming in CUDA C: the Mandelbrot set

Don't use the Sun compiler for this exercise,- please use gcc from now on.

Use your exercise from last week as the starting point. If you used the Fortran version for OpenMP, you now have to consider the C version for CUDA C. A Makefile template is provided on DTU Inside.

Exercise 3:

1. Write CUDA C code for generating the mandelbrot set on the GPU. Setup the GPU $\rightarrow$ CPU transfer of the resulting output. Run the executable and check the output in the mandelbrot.png file.

   Hints: Work initially with only one thread until the result is correct, then go for a 2D launch configuration that uses one thread per pixel. Use `cudaMallocHost` and `cudaFreeHost` instead of `malloc` and `free` in order to get pinned transfers.

2. Time your code and calculate the speed-up compared to the OpenMP version from week 2. Consider what influence warming up the device has.

3. How much time is used for compute and how much for the GPU $\rightarrow$ CPU transfer of the output? Calculate both the speed-up including transfer and excluding transfer.