NSC miniproject 2

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Figure 1: heatmap of execution times for the different methods and their array sizes (or grid size for opencl)

All the algorithms were run on a Ryzen 5 3600 at 4GHz with 32GB of RAM at 3000MHz and an AMD Radeon Rx 580. All implementations were run for 1000 iterations and all were locally executed.

The Mandelbrot algorithm has numpy.**all**(numpy.**abs**(z) >= 2) which makes it so that it shortens the execution time for the blocks located in regions where divergence is obtained quickly. This is true for all runs.

The data types for the generated array are explicit and are set to float128 and complex128. All functions have a docstring, and all functions in mandelbrot_tools have been unit tested with the unit_test.py file with some random functions.

The OpenCL kernel has the input and output as global, where the input is a float2 vector and the output is a binary array of ushort. The maximum number of iterations is a ushort constant.

The execution times and array size or grid size in the case of OpenCL can be seen in figure 1, where the vectorized and dask vectorized was run on the CPU and opencl was run on the GPU.