Fractal Computation Using Float vs Double:

When computing the fractal images using either a float or double significantly changes the performance of the parallel computation speed, thus drastically increasing the overall speedup compared to the serial program. More specifically, cases such as 1980x1080 with 45 frames took 0.056408 seconds when using doubles, while floats within the functions produced the same frames in 0.029734 seconds. Here we can see the speed of the floating point computation was almost halved compared to the program using doubles. This is because of the fact that the computation quantity for both programs are the same as all other integer parameters that decide thread and block allocation are the same, but the arithmetic operation speed changes. Because floats are 32 bits and doubles are 64 bits, the operations take roughly double the amount of time, which when accounting for the numerous amounts of arithmetic operations done within the computation across all of the threads and blocks, leads to double the performance when using float variables.