# Numerical Scientific Computing – Mini Project Part 2

## Optimization of data types

**Size:** 10000

**File:** mandelbrot\_datatypes.py

## Execution time between NUMPY and DASK version

**Size:** 5000

**File:** mandelbrot\_dask.py

## Local DASK execution

**Size:** 1000

**File:** mandelbrot\_dask.py

## Distributed DASK execution

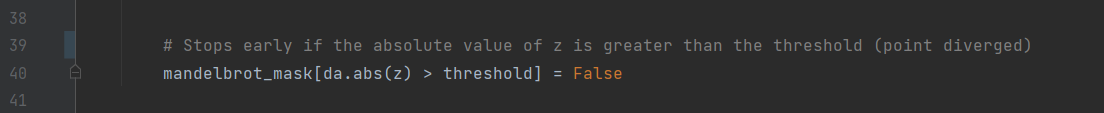
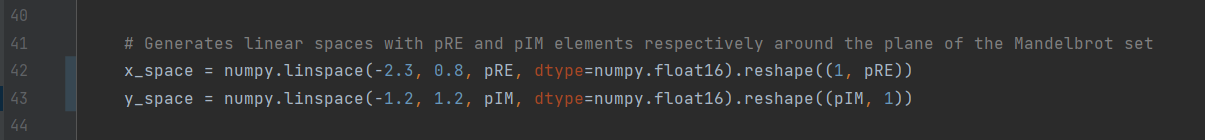
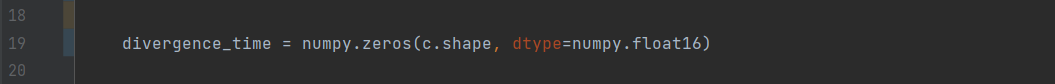
**Size:** 1000

**File:** mandelbrot\_dask.py

## Chunk Size Performance

In the previous two tests, it was found for both local and distributed that a chunk size of 500 was the best performing.

## Improvements/optimizations

1. Stops early if a point is already diverged. See the end of the Mandelbrot function in both mandelbrot\_dask.py and mandelbrot\_vectorized.py:
2. The NumPy version of the Mandelbrot is optimized to run on the most optimal data-type based on the first computation test. See mandelbrot\_vectorized.py:
3. Using dask.abs() is more optimal than using numpy.abs(), since DASK uses lazy evaluation.  
   