

2 Task 2

Task 2 (and 3) was executed on the cluster with the following settings:

- iterations: 10
- resolutions: 125, 500, 2000, 4000
- No. of processors: 1, 2, 5, 10, 20, 40, 60, 80

The provided slurm files for the execution on the cluster were adapted to fit our implementation.

As can be seen in the speedup plot 1 the lower resolutions do not profit as much of the speedup as the higher resolutions since they departed more from the ideal speedup line. The cause lies in the higher growth of effort for communication than for the calculations. No super-linear speedup occurred, indicating that the database size is smaller than the memory of one single node. A similar trend can be seen in the efficiency plot where the ideal speedup factor was normalized. Here, the largest resolution reached $\approx 90\%$ of the ideal speedup (for 80 processors) in comparison to $\approx 40\%$ for the lowest resolution.

The results of the Euclidian and Maximum norm were compared with a pure serial implementation and matched exactly.

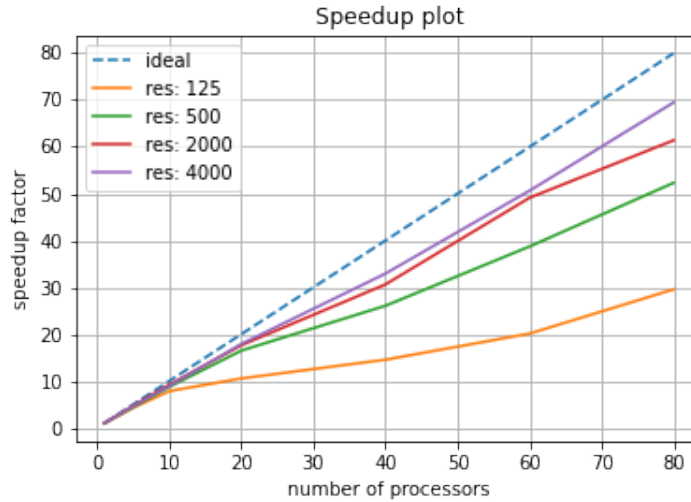


Figure 1: Speedup for different resolutions dependent on the number of processes.

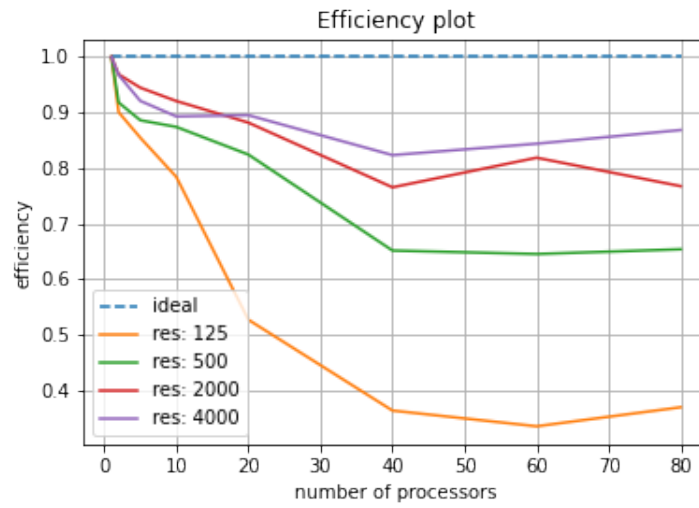


Figure 2: Efficiency for different resolutions dependent on the number of processes.