Homework 2
Parallel & Distributed Computer Systems
November 30, 2014

Write a distributed program that sorts N integers in ascending order, using MPI [1] [2]. The inter-process communications should be handled by the *Bitonic sort* algorithm.

The program must perform the following tasks:

- Wait for the user to specify two positive integers q and p.

- Start 2^p processes with an array of 2^q random integers is each processes.

- Sort all $\left(2^{(q+p)}\right)$ elements int ascending order.

- Check the correctness of the final result.

Your implementation should be based on the version of bitonic sort that is given and not others, that might be found on the web. Choose between the iterative and recursive form of the algorithm.

You may use the C standard library function stdlib qsort() to check the correctness of your results and as local sorting routine for each process.

You must deliver:

- A report (about $3 - 4$ pages) that describes your parallel algorithm and implementation.

- Your comments on the speed of your parallel program compared to the serial that is given, after trying you program on hellasgrid for $p = [1 : 7]$ and $q = [16 : 20]$.

- The source code of your program.

Note: More detailed information on the experiments you should run on hellasgrid will be provided, during the course of the project. You can also use diades for the development of your program.

Ethics: If you use any code found on the web you should mention your source, as well as the changes you made.

Deadline: Tuesday, 23 December, 2014.

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[1] http://www.mpich.org/?s=downloads

[2] https://computing.llnl.gov/tutorials/mpi/