

ASSIGNMENT 3

Write a parallel program computing the product of two $n \times n$ dense matrices, $C=A \times B$, using a master process and p worker processes.

The 1-dimensional parallel algorithm of matrix multiplication should be employed:

- Matrices **A** and **B** are originally in the memory of the master process.
- The master process horizontally partitions matrix **A** into p equal slices (we assume that p divides n) and sends the whole matrix **B** and one slice of **A** to each of the worker processes (there is one-to-one mapping between the partitions of **A** and worker processes).
- Each worker process computes of the corresponding slice of the resulting matrix **C** and sends it back to the master process.
- The master process receives slices of matrix **C** from the worker processes and forms the resulting matrix **C**.

Use sockets and `SOCK_STREAM` for communications. When started from shell, the master program accepts the matrix size n and the number of worker processes p as command line arguments. The only command line argument of the worker program is the IP address of the master. This argument is optional. If it is missing, then it is assumed that the master and the worker are running on the same computer.