Homework 6
due Nov 23, 2022

Exercise 6.1 : Matrix product based on matrix times vector

Write a MPI program that does the multiplication of two *rectangular* matrices $C = A \cdot B$. Use a block-row distribution for the matrices.
(Hint: build the pieces of the row-times-column scalar products which can be computed using the local blocks of the matrices; then make a circular shift of the rows of B and build the next pieces of the scalar products with the local blocks, etc.)
As usual add a timing function, including and excluding the time for I/O (reading and writing).

Test your program using the matrices contained in the files *A.txt* and *B.txt* available at `http://csis.uni-wuppertal.de/courses/lab217.html`.

In each file, the first two entries indicate the dimensions m and n of the matrix, while the following $m \times n$ numbers are the entries of the matrix, in row-major order (e.g. $a_{00}, a_{01}, a_{02}, ...$). Let your program write the resulting matrix C in the same format (stored in a file *C.txt*), you can use the matlab script *check.m* available on the course's website to verify the result. *What do you see?*
(*Note:* make sure you use a number of processes of which the first dimension of the matrices is a multiple.)

(25 points)