

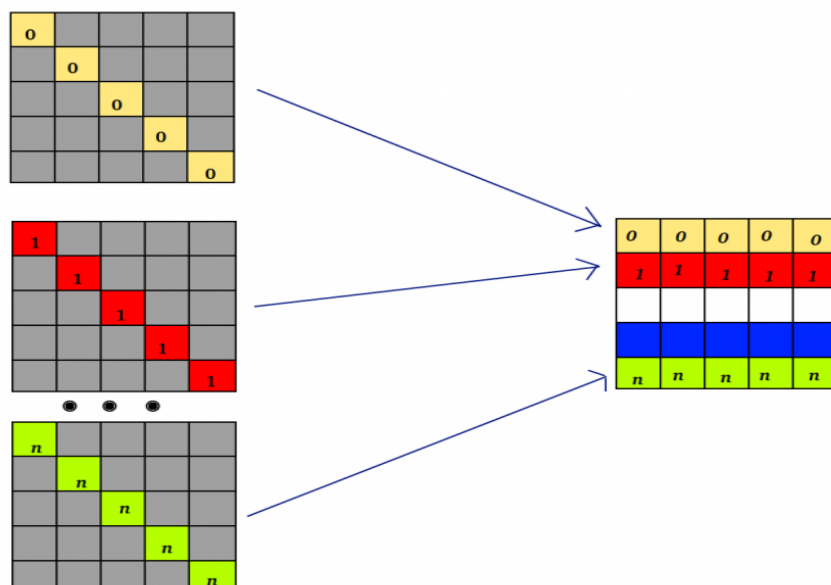
Exercise 10

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Each task initializes a square $n \times n$ matrix (n is the total number of the tasks) with 0s, except for the diagonal elements of the matrix that are initialized with the task's rank number.

Each task sends to rank 0 an array containing all the elements of its diagonal. Task 0 overwrites the array sent by process i on

the i -th row (column if Fortran) of its local matrix. At the end, task 0 prints its final matrix, on which each element should be the number of its row (or column).



In order to send a diagonal, a proper vector datatype should be created and set for reading the diagonal elements of a matrix with the right displacement and stride. When you are communicating to rank 0, keep in mind that you are sending a single vector datatype, but you want to receive an array of n elements, that have to be stored contiguously in its matrix row (or column).

HINTS:

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