

Home Work

Write a program (hereinafter referred to as "server") which is able to perform multiplications between matrices and vectors.

The server will periodically scan the contents of a directory (location is indicated during startup), waiting for input files.

When a "client" wants to perform a computation, it writes a file into that directory containing the parameters for the computation: size, dimensions, elements.

The server will then compute the result, removing the input file and writing the result in a second directory of your choice.

The calculation of the result must be carried out in parallel, with multiple processes that synchronize and exchange information using shared memory and semaphores.

The server will dynamically choose the number of processes to be used for the calculation based on the size of the input data and on a parameter (the "threshold") specified in its input file (see below).

If the size of the matrix (vector) is less than the threshold, then the calculation will be performed by a single process.

If the size is between the threshold and two times the threshold, then two processes will be used and so forth.

The server, at startup, will read the parameters from an input file whose path will be indicated by the command line, or from a default location in the absence of this.

The input file contains:

- The name of the directory for input files
- The name of the directory for output files
- The minimum size (# of elements, the "threshold") for parallel computation