Graded Lab Session 4 - 5, Concurrency and Parallelism

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Abstract

The goal of this session is to design and implement an common application but in a concurrent fashion. In order to realize the exercises, you will require the following documents: i) this lab session subject ii) the files spec.txt and result.txt iii) the course (Lecture 4) iv) the JAVADOC.

This assignment is personal.

Matrix multiplication

Design and implement a JAVA program that is performing a matrix multiplication in a concurrent fashion.

The file *spec.txt* attached to this document gives an example of an XML format encoding all the informations required to perform a matrix multiplication in a concurrent fashion. One can find:

- The number of threads allowed to this operation
- The number of cores allocated to this operation
- The description of the two matrices to multiply. Since matrix multiplication is not symmetric, the position of the matrix is given ($A \times B$ versus $B \times A$).

As a result, the program should generate a file *result.txt* which contains the same data than *spec.txt* plus the following:

- The resulting matrix.
- The execution time .

1/Design the algorithm using one of the modeling tool presented in Lecture 4. 2/Implement the algorithm in JAVA.

The deliverable are a synthesis report of 1 to 3 pages which present the design of your algorithm and an introduction to the implementation.

The mark will be based on the following criteria:

- The clarity and usefulness of the report. After reading the report, reading the code should be straightforward.
- The usage of the modeling tool to express the complexity of your algorithm.
- The functionality! the program should compute a correct result.
- The usage of the JAVA primitive to do multi-threading.
- The performance and the adaptability of your algorithm to the number of threads and cores allocated.
- The clarity and simplicity of your implementation. A javadoc or at least some comments are expected in the source file.
- Your honesty! If you takes a piece of code somewhere, tell it and give credit.

An archive containing the report plus the source code has to be send to jean-vivien.millo@inria.fr before November, 15th 2012 at 23:59 (French time).