BE OpenMP

14/03/2024

This BE is made of five different exercises of different difficulty for a total of 100 points:

- Part 1 Integration: an exercise on the parallelization of an integral computation. 15 points.
- Part 2 manual_reduction: an exercise about parallelizing an array reduction operation. 15 points.
- Part 3 minimizer: an exercise on parallelizing a method that computes the minimum of a convex function. 25 points.
- Part 4 prefixscan: an exercise on the parallelization of an array exclusive prefix scan. 25 points.
- Part 5 Procedures: an exercise on parallelizing a code that executes a sequence of procedures. 20 points.

For each exercise, detailed explanations and instructions are given in the subject.pdf file inside the corresponding directory.

If you want to provide details or explanations about your work in textual form, you can do it in the form of comments directly in the source code.

General advice:

- When implementing the parallelization, test your code on small data. When you're sure everything works fine, increase the size of data to evaluate performance.
- All the proposed parallel solutions have to work with any (reasonable) number of threads. This means that the parallel code has to work also in the case where only one thread is used. Check your parallel code with one thread first; this case will be easier to debug in case of problems. Then test with more threads.

- The amount of coding required in each exercise is relatively small. If you find yourself writing a lot of code, you're probably on the wrong track.
- OpenMP tasks is a very powerful tool but also usually introduces some overhead. Use this feature with care.

Important

Once you have finished execute the pack.sh script like this:

\$./pack.sh

This will generate a package containing the code you have developed and the responses you have provided. This file is named

username.tgz

where username is your username.

Upload this file into the OpenMP course page on Moodle in the section corresponding to your room.

Before leaving verify with the supervisor in your room that the package has been received.