Final Project – OpenMP

1. Description

The final project consists of parallelizing the program **seismic.c** using OpenMP and executing it on the FT3 system to evaluate its performance. **It can be done individually or in pairs.**

The application SEISMIC simulates an earthquake. The source code is available in Aula Cesga → Documents → OpenMP → FinalProject. It requires an input file named seismic.in. The folder contains the source code seismic.c and two different input files: seismic.in and seismic.in.short. Note that the code uses mathematical functions, so you must link the math library with the -lm flag.

The program consists of several subroutines and has more than 1500 lines of code. Thus, you should apply an incremental parallelization, starting with the most computationally costly parts. Use gprof to analyze the code, get information about the program and decide which subroutine or subroutines to parallelize.

2. Submission

Use Aula Cesga (Assignments) to upload the OpenMP version of the codes, together with a report explaining:

- Code analysis
- Parallelization steps
- Execution results on FT3 with different numbers of threads
- Steps followed on FT3 to obtain results
- Analysis and discussion of the results

Deadline: December 15th 2025

3. Evaluation Criteria

The final grade will depend on the analysis of the code, correctness and quality of the parallel version, the results obtained on FT3 and the clarity and completeness of the report.

Weight: 50% of the OpenMP grade

Remember:

- Always check that the parallel code produces correct results, comparing with the sequential version.
- To measure execute times use dedicated resources, execute the program multiple times and compute the average (if variability is small) or the median (if variability is significant).
- The sequential version of the code should be the reference baseline to compute speedups/efficiency