



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

High-Performance Computing Lab for CSE

2024

Student: FULL NAME

Discussed with: FULL NAME

Solution for Project 1a

Due date: 11 March 2024, 23:59

HPC Lab for CSE 2024 — Submission Instructions
(Please, notice that following instructions are mandatory:
submissions that don't comply with, won't be considered)

- Assignments must be submitted to Moodle (i.e. in electronic format).
- Provide both executable package and sources (e.g. C/C++ files, Matlab). If you are using libraries, please add them in the file. Sources must be organized in directories called:
Project_number_lastname_firstname
and the file must be called:
project_number_lastname_firstname.zip
project_number_lastname_firstname.pdf
- The TAs will grade your project by reviewing your project write-up, and looking at the implementation you attempted, and benchmarking your code's performance.
- You are allowed to discuss all questions with anyone you like; however: (i) your submission must list anyone you discussed problems with and (ii) you must write up your submission independently.

1. Euler warm-up [10 points]

1. The module system is a tool used to manage software environments on a Euler. It allows us to configure their environment by dynamically loading or unloading software modules. These modules adjust system variables to ensure that the necessary binaries and libraries are accessible. You use it by loading specific software versions with module load and unloading them with module unload when done.

2. Slurm is a tool used in big computer clusters to help manage who gets to use the computers and when. It schedules tasks and makes sure everything runs smoothly by allocating resources like processors and memory. It's like the traffic controller for a cluster of computers.

3. see hostname.cpp

4. see slurm_job_one.sh

5. see slurm_job_two.sh

2. Performance characteristics [50 points]

2.1. Peak performance

2.2. Memory Hierarchies

2.2.1. Cache and main memory size

2.3. Bandwidth: STREAM benchmark

2.4. Performance model: A simple roofline model