



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

High-Performance Computing Lab for CSE

2024

Student: FULL NAME

Discussed with: FULL NAME

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Solution for Project 1a

Due date: 11 March 2024, 23:59

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**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]

## 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