Programming Parallel Computers

Aalto 2023

MF1: CPU baseline ★

Please note that you can still submit, but as the course is already closed, your submissions will not be graded.

To get started with the development, **download the code templates**, unzip the file, edit mf.cc, and run `./grading test` or `./grading benchmark` to try it out — see the **instructions** for more details!

Upload your solution as a file here...

Please upload here the file **mf.cc** that contains your solution to task MF1.

Choose File No file chosen

... or copy-paste your code here

Submit

Your submissions

Your submissions to MF1 will appear here; you can simply **reload** this page to see the latest updates.

What you will need to do in this task

Please read the **general instructions for this exercise** first. Here are the additional instructions specific to this task:

> Implement a simple **sequential** baseline solution. Make sure it works correctly. Do not try to use any form of parallelism yet. You are expected to use a naive algorithm that computes the median separately for each pixel, with a **linear-time median-finding algorithm**.

What I will try to do with your code

I will first run all kinds of tests to see that your code works correctly. You can try it out locally by running `./grading test`, but please note that your code has to compile and work correctly not only on your own computer but also on our machines.

If all is fine, I will run the benchmarks. You can try it out on your own computer by running `./grading benchmark`, but of course the precise running time on your own computer might be different from the performance on our grading hardware.

Benchmarks

Name	Parameters
benchmarks/1	hx = 10, hy = 10, nx = 100, ny = 100
the input contains 100 × 100 pixels and the window dimensions are 21 × 21 pixels	
benchmarks/2	hx = 10, hy = 10, nx = 500, ny = 500
the input contains 500 × 500 pixels and the window dimensions are 21 × 21 pixels	
benchmarks/3	hx = 10, hy = 10, nx = 1000, ny = 1000
the input contains 1000 × 1000 pixels and the window dimensions are 21 × 21 pixels	
benchmarks/4	hx = 10, hy = 10, nx = 1500, ny = 1500
the input contains 1500 × 1500 pixels and the window dimensions are 21 × 21 pixels	

Grading

In this task your submission will be graded using **benchmarks/4**: the input contains 1500 × 1500 pixels and the window dimensions are 21 × 21 pixels.

The point thresholds are as follows. If you submit your solution no later than on **Sunday, 30 April 2023, at 23:59:59 (Helsinki)**, your score will be:

Running time	Points
≤ 30.000 sec	1
≤ 20.000 sec	2
≤ 15.000 sec	3
≤ 12.000 sec	4
≤ 9.000 sec	5

If you submit your solution after the deadline, but before the course ends on **Sunday, 04 June 2023, at 23:59:59 (Helsinki)**, your score will be:

Running time	Points
≤ 30.000 sec	1
≤ 15.000 sec	2
≤ 9.000 sec	3