

Math 4997-3 Quiz 5: Due by 2021/09/30

Exercises

1. Programming on paper (2 credits):
Write a program that computes

$$A = B + C$$

where $A, B, C \in \mathbb{R}^n$ are `std::vector<double>` in parallel. You can either use `std::async` Or `std::execution::par` for the parallelism.

2. Definitions (2 credits):
Explain the following terms in your own words:
 - Asynchronous vs synchronous programming
 - Explain what a `std::future` is and how to utilize it for parallelism in your application.

Programming exercise

1. Parallel Monte-Carlo method: (2 credits)
Use your solution of the Monte-Carlo method and add parallelism to your implementation using `std::async` and `std::future`. Try to launch some of the functions asynchronously and synchronize them using the future objects.
2. Parallel N -body simulation (4 credits)
Use your solution of the N -body implementation and add parallelism to your implementation using `std::execution::par` in some of the `for` loops. **Optional:** Try to launch some of the functions asynchronously and synchronize them using the future objects.

Please contact me, if you need the solutions of these programming exercises.

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