

Task3

[10 Marks]

Discuss how to introduce parallelism

In your report explain:

- (a) How you plan to add parallelism in the algorithm.
- (b) Why is it going to help in simulating particle moving, attracting each other and merging?
- (c) What kind of data contentions you will need to resolve?
- (d) How are you sure that there is no hidden aliasing creating unpredicted data contentions?

Task4

[30 Marks]

Implement ModelParallel

Here you need to implement the parallel version of the model. You can use any technique that we have seen in the class or that you discover in any other way.

However, all the code must be in Java and run in a single JVM process.

Note: This is the bulk of the project, and while it's worth only 30 marks individually, is a fundamental building block for the next two parts

Write four or five sentences explaining your design decisions for task 4.

Task5

[15 Marks]

Test ModelParallel Correctness

You need to ensure that ModelParallel behaves exactly as Model in all the situations.

You are free to use any kind of tool that you can find/access to improve the quality of your work. State the use of the tools **in the report** and it will be positively considered.

To show this: create and write the appropriate test files in your project and **In your report:** Explain your testing techniques and justify why the testing results gave you a good level of confidence that your work is correct.

Please, use a sentence like “In order to ensure that ModelParallel behaves exactly as Model in all the situations I designed the following automated testing strategy:... This gave me a high level of confidence because ...”

Task6

[15 Marks]

Test ModelParallel Efficiency

You need to show that, at least in some important cases, ModelParallel runs faster than Model.

You are free to use any kind of tool that you can find/access to improve the quality of your work. State the use of the tools in the report and it will be positively considered.

To show this: create and write the appropriate test files in your project and **In your report:** Explain your testing techniques and justify why your testing give you a good level of confidence that your work is efficient.

Please, use a sentence like “In order to check that ModelParallel is more efficient than Model I designed the following automated testing strategy:... This gave me a high level of confidence because ...”

TO SUBMIT: Your submission should include:

1. A jar file with all your code
2. Your report (in pdf format (more preferred) or txt format(less preferred))
3. A txt file stating any bugs in your code and how to run your code (ie a readme file)