

CO225: Software Construction

Lab 08 : Java Concurrency (Threads)

Aim:

The aim of this lab class is to use Java threads abstractions to implement matrix operations effectively. You need to think of a way to parallelize the operation and implement that using the thread interface.

Task:

Download the skeleton code from FEeLS and try to understand what it is doing. You should recall the matrix multiplication from your mathematics courses as well.

Your task is to implement the `public static int [][] multiply(int [][] a, int [][] b)` using Java threads.

In your implementation, you should consider the following:

1. How to use threads to parallelize the operation?
2. How many threads to use?
3. How to allocate work for each thread (recall it is the run function which all the threads execute)?
4. How to synchronize?

You should list all your assumptions and answers to these questions in the code itself as comments.

Extra:

This part is extra and if you complete it correctly, will get bonus marks. Consider how the cache memories work from the computer architecture course.

1. Is this implementation cache friendly?
2. Can you think of a way to make it so?
3. You should show that your method is cache friendly and hence efficient by measuring and comparing the run time.

Submission:

You have to submit your code as a single zip file.