

Homework 5

The Java code gives you the code to partition three arrays a, b and c into chunks and then perform a matrix multiply $c = a \times b$ by performing matrix multiplies on the chunks. Much of the hard work of doing the matrix multiply is done in this code.

You will use the Command pattern. Your task is to create a queue of commands to be performed, where each queue item performs the matrix multiply on one of the chunks above. You should then create 4 threads whose run method will pull items from the queue and execute them.

Your queue should be a thread safe data structure. ArrayList is not thread safe, but Vector is.

Once you have matrix multiply running, add dot products to the queue along with matrix multiplies. Add at least 4 dot products to the queue. Each dot product should have 2000 elements in the arrays. Again, have four threads pull work items from the queue and execute them.

Your program should allow a number of threads to be specified that will be created and pull items from the queue and execute them.

The Main.java file shows how to time the execution. When you have completed the work above, time doing the work with 1, 2 and 4 threads and include a .txt files with the results of your times.

Your code should be in a .zip file that only contains your source files, the .txt file with timing information, and a makefile that executes your program. If you are having trouble with makefiles include a README.txt file that says how to build and run your code.

Post questions on piazza.