SWE 507 PARALLEL PROGRAMMING PROJECT STUDY 1 (2024)

Due date: 22 March 2024, class time.

In this project, you are expected to do thread level parallel programming, and measure the performance (execution time). Experiments will be done using Pthreads (in C with gcc compiler), and Java Thread library JVM version 17.

- Create a largest possible size matrix that your computer allows with double (real) numbers in the heap.
- Fill this matrix with random real numbers between 0-1 exclusive.
- Start time-stamping
  - Multiply every element with PI number.
  - Find the maximum element in the matrix.
  - Divide every element with this maximum number.
  - Add all the numbers in the array, show the total sum in the screen at the end.
- End time-stamping
- Repeat this 5 times and take average execution time.
- Do this 1, 2, 4, 8 and 16 threads.
- Draw a graph using spreadsheet that shows thread count (x-axis) versus execution time (y-axis)
- Do the same experiments and graphs with Java threads.
- Compare and comment the results.

Problem: How would you justify that your program works correctly.

Grading:

No	Task	Grade
1	Pthread section works perfectly	40
2	Java threads section works perfectly	40
3	Graphs and comments about study.	20

PS: In class presentation is required.