

## COMP60011 - LAB 0

At the latest marking of Parts I & II will take place on next week's lab session (i.e. Monday 16<sup>th</sup> Nov). For marking Part III, a document (only PDF, ODF, or Word 2003) will be emailed to [comp60011@googlemail.com](mailto:comp60011@googlemail.com) before 9:00am on Monday 16<sup>th</sup> Nov.

Part I – Check the documentation for `java.lang.Thread`. The objective of this exercise is to write a HelloWorld Java program that

- (1) takes as an input parameter the number of threads to be created, and
- (2) each one of these threads will print in the standard output the message “Hello World, I’m thread Z” (where Z is an integer uniquely identifying each thread).

Part II – Check the documentation for `java.lang.System` and learn how to time an activity. Create a TimedHelloWorld Java program that

- (1) takes as an input parameter the number of threads to be created,
- (2) each one of these threads will print in the standard output the message “Hello World, I’m thread Z” (where Z is an integer uniquely identifying each thread), and
- (3) only the odd threads will also print “Thread Z lasted for X seconds” (where Z is the integer uniquely identifying each thread and X is the measured execution time for that specific thread).

Part III – You have a program that executes in T seconds although there is a portion that you can optimize.

- (1) Assuming that the optimizable portion is Z (where  $0 \leq Z \leq 1$ ) and that you are pretty sure that you would reduce the execution time of that portion of the program by 8 times, how much faster than the original would the new program be?
- (2) What speedup results do you get using, e.g., the Z values 0.5, 0.7, 0.8, 0.9, 0.95 and 0.99?
- (3) Consider now that you can improve the execution time by X times the execution time that same portion of the program. Plot a 2D graph with one line for each Z value where the horizontal-axis represents X values 1, 2, 4, 8, 16, 32, 64, 128 and the vertical-axis represents the calculated speedup.
- (4) What can you tell about a parallel program?