Addis Ababa University
Addis Ababa Institute of Technology
School of Electrical and Computer Engineering

ECEG – 6518: Parallel Computing

Assignment One – Getting familiarized with Parallel Programming

1. Measuring the effect of Parallelization

Using one of the suggested methods in class (p-threads, OpenMP, C-Sharp or Java Threads) implement an application that adds two integer vectors (A,B) and stores the result on vector C. The size of these vectors is to be set at 67108864 (use dynamic memory allocation for this to work).

Measure the time it takes to do this vector addition for sequential implementation and parallel implementation. In the case of the parallel implementation measure the run times as the thread number is increased from 2, 3,... some max value you decide.

Hint:
- You need to make sure the load is distributed to the threads.
- Run the code under measurement multiple times (10 or 20 times) and report the average of the measured runtimes. You need From now on when taking runtime measurements

2. Measuring the effect of overhead on Parallelization

Using the thread number found to be best performing on your machine do the following experiment. Keeping the thread count fixed measure the time it takes to add integer vectors of size 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072, 262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216, 33554432, 67108864 for both the sequential and parallel implementations.

Bonus

3. Measuring the effect of Parallelization Technologies.

Instructor: Fitsum Assamnew (Dr.)

You have chosen a parallel computing technology for task 1 and task 2. In this bonus task, choose another technology and repeat the experiments in task 1 and task 2. Compare and contrast the results of your experiments.

Instructions: Report the results you found and explain what you understand by them. It is more important to compute the **speed up** and plot it than simply showing the measured runtimes. More meaning can be extracted from the plot of the speed up. Please follow the reporting format posted on the course page.

Due Date: _____

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