Project 2

Summary

In the second project you will work in groups of 2. Find your group partner before the conclusion of the non-teaching week. Exactly one in each group email me with the email subject line [COMP90025 Group] and list you and your group parter's name and login names. CC to your group partner as well.

Tasks

- Select a real world problem that requires a synchronous or loosely synchronous parallel algorithm implementation, or otherwise is not strictly data parallel, e.g. it requires some computation when putting together individual processed elements to form the final result. The N body problem and heat flow problem are examples of synchronous and loosely synchronous problems resp. Edge detection in images is an example that requires some computations between individual parts. You can cite and use a parallel implementation that you find in the literature as a starting point. You may do some research to find an interesting problem. Other examples might be the Traveling Salesman Optimization by Simulated Annealing, Chemical Reaction Dynamics and Solving the Accoustic Wave Equation. If you have trouble selecting a problem, let me know as soon as possible.
- Similarly to previous work, conduct experiments for differing problem sizes and differing numbers of processing nodes and other relevant parameters. Make use of OpenMP, MPI and if the cluster eventually supports it, GPU. Conduct a range of experiments, start early so that larger experiments have time to complete, and report your observations using appropriate tables and charts.
- Write at most 2000 words, not including figures, that describes your experiments and observations. Critically discuss what you observe with respect to the parallel implementation that you have used and the underlying architecture. Discuss your approach for parallelization.

Assessment

Project 2 is worth **20%** of your total assessment. It is group work. Assessment is based on the level of completeness, critical thinking and presentation; as discussed in lectures.

Due Friday Week 12

- Submit a PDF (use PDF only, no other format will be assessed) via LMS on or before **Friday 23rd October, midnight**. An LMS assignment submission link will be made available in the near future for this. Standard university penalties will apply to late submissions.
- Use an Appendix to your PDF report and list your source code.
- Use 10pt font, 1 inch margins all around and single column. Use appropriate headings and clearly label and refer to figures.