Introduction to Supercomputers: Problem Set 4

Sindre Magnussen

January 2014

Introduction and answers

In this assignment we were supposed to write a program that calculates the sum in (1) with a range of n-values and compares the result with equation (3):

$$S_n = \sum_{i=1}^{n} v(i) \tag{1}$$

$$v(i) = \frac{1}{i^2}, \qquad i = 1, \ldots, n \tag{2}$$

$$S = \lim_{n \to \infty} S_n = \frac{\pi^2}{6} \tag{3}$$

The code I have written makes it possible to enable both serial, OpenMP-code and at MPI-code. Both MPI and OpenMP should work together. The code has been tested on a local machine. See the following explanation of how to enable the different run-options:

Serial program
The serial program can be run by setting OPENMP_EN and MPI_EN to OFF in the CMakeCache.txt.

OpenMP-code
Enable OPENMP_EN, by setting it ON in CMakeCache.txt.

MPI-code
Enable MPI, by setting it ON in CMakeCache.txt.

In this particular problem, I don't think it is necessary