CEE 618 – Scientific Parallel Computing: Homework #6

Name:_____

Noon, Friday 21, 2013

1. (50 pts) Write a proposal for your final project, following the criteria below.
   (a) This is the first draft, which will be revised and modified in consulting with me. Do brainstorming for your project.
   (b) Two cases can be typical and usual.
      i. You can downsize parts of your research (sub)projects or any interesting topics of your own. Isolate the topics as an independent FORTRAN code. Make a serial run, measuring elpased times. Parallelize your serial codes using MPI.
      ii. You can select any mathematical or scientific problem that do have right solutions. Generate a parallel code to get the same result, but within a short period of time.
   (c) The project requires a full, complete series of steps that you develop a problem with justification, propose solution methods with suggested outcomes, and do the project!
   (d) Evaluation of the final project is primarily project **completeness**, not the difficulty level or fanciness of sophisticated problems.
2. (50 pts) Do a series of performance test using several candiate of OpenMP. Make a benchmark table: column = various omp codes for the same calculation, row = the number of threads (1, 2, 4, 6, 8), data = elapsed time. For each case,
   (a) Login fractal and "ssh c18"
   (b) Use intel fortran compiler, ifort
   (c) Compile your openmp code: $ ifort␣myomp.f90␣**-openmp**␣-o␣myomp.x
   (d) Specify your thread number (1, 2, 4, 6, and 8): $ export␣OMP_NUM_THREADS=2
   (e) Run your executable, measuring time: $ time␣myomp.x