Programming Assignment II: OpenMP Programming

The purpose of this assignment is to familiarize yourself with OpenMP programming.

1 Problem Statement

Conjugate gradient method is an algorithm for the numerical solution of particular systems of linear equations. It is often used to solve partial differential equations, or applied on some optimization problems. You may get more information on Wikipedia (`http://en.wikipedia.org/wiki/Conjugate_gradient_method`).

In this assignment, you are asked to parallelize a serial implementation of the conjugate gradient method using OpenMP. The serial implementation can be downloaded on New e3 system. It contains:

- `cg.c`
  The implementation of the conjugate gradient method.
- `globals.h`
  Some data definitions. **DO NOT** modify this file.
- `common` directory
  Directory that contains some functions for time calculation and random numbers. **DO NOT** modify the files in this directory.
- `bin` directory
  Directory that contains the executable.
- `Makefile, make.common`
  Makefiles.
- `README`
  The information of the program.

2 Requirements

In this assignment, you have to modify `cg.c` to improve the performance of this program (i.e., to insert OpenMP pragmas/library routines to parallelize parts of the program). Of course, you may add any other variables or functions if necessary.

Note:

- **DO NOT modify/add any output messages.**
- **Grading will be made based on the speedup/efficiency that your implementation would yield.**

3 Evaluation Platform

Your program should be able to run on UNIX-like OS platforms. **We will test your program on the workstations** dedicated for this course. You can access these workstations by **SSH** with the following information.

IP	Port	User Name	Password
140.113.215.195	37031–37034	[Student ID]	[Provided by TA]

4 Submission

Please rename your `cg.c` to `<your-student-id>.c` and upload it to e-Campus system by the due date.

Due Date: 23:55, November 15, 2019

5 References

- `http://openmp.org/`
- `https://computing.llnl.gov/tutorials/openMP/`