Programming Assignment 1

Due date: 11:59:59PM 2/13/2018

Environment setup:

Option 1: Install GCC 5.4 (https://gcc.gnu.org/gcc-5/) on your machine.

Option 2: To make your life easier, our TA created an account on the server eecs-hpc-1 for each student. To log in the machine, use ssh:

ssh your_multi_pass_username@eecs-hpc-1.mines.edu

Your temporary password is tmp123. Please change it immediately after logging in.

NOTE: If you are out of campus, you should use vpn (http://inside.mines.edu/CCIT-VPN) for the connection.

Problem 1 (50%):

What you need to do in your code:

All your code for this problem should be in one file named homework1_1.cpp. I should see no compilation errors if I do:

    g++ homework1_1.cpp –o homework1_1 -fcilkplus

The executable should 1) take a positive integer N as an argument, 2) create an integer array of size N, 3) populate the array with random integers from range [1,1000], 4) find the largest integer and the sum of the array in parallel, and 5) print the largest integer AND the sum of the array.

Example:

Command line execution: ./homework1_1 568 (Suppose homework1_1 is the executable.)

Output: Maximum: 982; Sum: 23487

Problem 2 (50%)

The N queens problem asks you to place N non-attacking queens on an N*N chessboard. No two queens can be in the same row, in the same column, or on the diagonal. You should write a parallel program in CilkPlus to solve the N queens problem by brute force search. Note that you should NOT prune any search space.

Input:

A positive integer N that represents the number of queens.

Output:

The number of possible solutions.

What to submit:

Submit two files (homework1_1.cpp for problem 1 and homework1_2.cpp for problem2) on Canvas.

How do I grade your submission:

30%: compilation pass

70%: correctness

If your code cannot pass compilation, you get 0 points.