CSC 4760/6750, Fall 2015
Programming Assignment 1
Assign date: September 16, 2015, Due: September 23, 2015 in class.

For this assignment you need to write the following versions of a program to calculate the value of the mathematical constant PI as described in the book.

1. Serial
2. Pthread parallel - with no protection for critical section where the sum of the terms is computed (figure 4.3).
3. Pthread parallel - with protection for critical section with busy waiting with no private variable to store partial sum (figure 4.4).
4. Pthread parallel – with private variable for storing partial sum and critical section for adding partial sums to update the global sum (figure 4.5), critical section is implemented using busy waiting.
5. Pthread parallel – with private variable for storing partial sum and critical section for adding partial sums to update the global sum (figure 4.6), critical section is implemented using pthread_mutex.

The name of the programs should be pi1.c, pi2.c, pi3.c, pi4.c, pi5.c. All versions of the program should take the number of terms in the series as command line arguments. The parallel versions should take number of threads as second command line argument. Your program should run compile and run on CSC hpc cluster. Run all the programs for 10000, 100000, 1000000, 100000000 million terms (parallel versions with 10 threads). Also measure the execution times of your runs. Write a report containing a table showing the value of PI for different number of terms in the series. The table should also show the execution times and speed up. The report should also contain a brief description of your experience with the lab and any difficulties that may have faced.

Submission:

Submit a copy of your source codes, a readme file (how to compile and run your code), and the report on ilearn. Also submit a printed copy of your report. Your submission will not be evaluated if you do not submit the hard copy of your report.