Lab Exam Pthreads

Instructions

The following is an approximation of natural logarithm of 2:

$$\ln(2) = \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} = 1 - 1/2 + 1/3 - 1/4 \ldots$$

Download a serial implementation of this algorithm from Canvas (serial.c) and modify it to get an pthreads parallel implementation.

You must proceed as follows:

1) Get the number of threads from a command line argument before forking any threads
2) Parallelize the relevant part of the code, make sure to protect any critical section.
3) Use timing functions (in the attached timer.h) to compare performance and accuracy of the serial algorithm vs the parallel algorithm. Is your program scalable?
   You should collect enough data to be able to do a weak and strong scaling analysis (i.e. various values of n and p doubling them every time, choose an appropriate n so that your program pi estimate is close to the Math library pi estimate). Tabulate the collected data and do not forget to include the efficiency values.

Notes and hints:

Beware of the alternating +/- sign. For some threads their work has to being with + and for others with -