Project 1: CS621, Spring 2016

Due Date: 11:50AM, February 17, 2016

This project helps you gain some experience by setting up an MPI environment and running some sample MPI programs on your own computer. You can also get an account on the supercomputer at the Center for Computational Science. For a step by step instruction on installing MPICH on Windows XP, please see Lecture Notes, Chapter 6, Pages 65-76.

Please see www.cs.uky.edu/~jzhang/CS621/project0.html for more details of the project, and download the sample codes.

Once you get your program running, you should do the following exercises to get a feeling of parallel computing. (20 points)

- Add an MPI function to compute and print out the time elapsed between the computations (see Tutorial on MPI: The Message-Passing Interface on the class webpage). This tutorial contains sufficient MPI materials for this class.

- Choose the number of nodes (intervals) to be a large number, say, 2,000,000 and run the program by specifying 1, 2, 4, 8, 16, 32 etc. processes and record the elapsed time.

- Choose the number of nodes (intervals) to be a smaller number, say, 200, and repeat the above procedure.

- Graph the relation between the number of processes and the timings.

- Modify the code so that you will not use MPI Reduce to collect the final result. Instead, ask each process to send its local sum to the process 0, which will compute the final sum and output the result.

- Submit a print-out of your code, two graphs showing the above tests, and a short explanation on the results you obtained.