CS 525: Parallel Computing
Spring 2001
Problem Set 3: Programming Message Passing Machines
Due Date: Mar 27, 2001 in class
No late submissions will be accepted

1. Estimate t_s and t_w of your platform by ping-ponging a message a large number of times and using it to estimate round-trip time and from it, latency and bandwidth by fitting a line on data with varying message sizes.

2. Code the 15 puzzle in MPI. In this simple version, do not use depth-first search. Rather, one processor (proc 0) generates p log p board positions. All the other processors request processor 0 for work, which hands off boards as work. Processor 0 must itself also process boards and check for work requests only periodically. The program terminates when a solution is found.

3. Write a parallel MPI program for the sieve of eratosthenese. Think through the parallelization strategy carefully before implementing it! Document your results clearly for sieves of various sizes and number of processors.