Akshay Jain
HPC, Assignment 1

Q1) MPI ring communication

ans:

For a single integer, on a machine with 4 cores, 1 million iterations took 13.246s.
-> latency per message : 13.246/4000000 = 3.31 micro-seconds/msg

For an array with 250k doubles (~2MB), on a machine with 4 cores, 10,000 iterations took 1m 6.177s.
-> throughput : 10k * 4 *2 /66.18 sec = 1208.8 MB/sec ~ 1GB/sec

Q2) Distributed memory parallel Jacobi smoother

ans:

A parallel version of the Gauss-Seidel smoother is more difficult because the calculation of each updated value of uk[i] uses values of u from the same iteration. Thus an iteration cannot be run in parallel on multiple cores.