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Final Project Overview

Final Project: Parallel 3D Jacobi Solver Using Hybrid MPI+OpenMP, and MPI+GPU

- You will develop two hybrid codes, based on the Parallel 3D Jacobi Solver you developed for HW3.
- Use Hybrid MPI+OpenMP, and MPI+GPU approaches.
- See topic notes on hybrid programming:
  http://www-rohan.sdsu.edu/faculty/mthomas/courses/f15/comp696/topics/mpi_notes#hybrid_mpi
- Characterize the performance of the model as a function of problem size, MPI cores, and OpenMPI threads or GPU cores.
- Define a metric for comparing the serial, MPI, and hybrid models.
- Written report due by email on 12/15/15; turn in copy of report by 12/16/15.
Prob 6A: Parallel 3D Jacobi Solver Using Hybrid MPI+OpenMP

- Process command line args for relevant variables
- Test performance as a function of matrix size and number of threads.
- Create batch script to run on single CPU nodes, and multiple OpenMP threads.
- Note: See class topic notes with hints on running MPI+OpenMP jobs on tuckoo:
  http://www-rohan.sdsu.edu/faculty/mthomas/courses/f15/comp696/topics/mpi_notes/#hybrid_mpi_openmp
Prob 6B: Parallel 3D Jacobi Solver Using Hybrid MPI+GPU

- Process command line args for relevant variables
- Use CUDA device functions to get device information such as number of devices on the node, max #threads, number of blocks, etc.
- Create batch script to run on multiple CPU nodes, and multiple devices on each node
- Test performance as a function of matrix size and number of GPU cores.
- Note: See class topic notes with hints on running MPI+OpenMP jobs on tuckoo:
  http://www-rohan.sdsu.edu/faculty/mthomas/courses/f15/comp696/topics/mpi_notes/#hybrid_mpi_gpu