

CISC 372: INTRODUCTION TO PARALLEL PROGRAMMING
Fall 2006

Final Exam Study Guide

Final Exam Time and Date: 10:30 am - 12:30 pm, Tuesday, December 12, 2006 regular classroom

1 References

- Lecture notes from midterm through December 5, 2006.
- Textbook: Relevant sections of textbook that go with material presented in class. (see schedule on course website)
- Lab 4, student oral presentations.
- Inclass handouts since midterm exam.
- Weekly quizzes.
- Exam Review.

2 Topic Coverage

- dynamic load balancing/runtime scheduling - versus static decomposition, how to implement, tradeoffs
- different modes of communication - standard, buffered, synchronous, ready and concepts regarding these modes (from handouts)
- overlapping communication with computation: blocking versus nonblocking, asynchronous communication
- test, wait, isend, irecv, probe, and others from handout
- creating and using communicators - MPI_Comm_create, MPI_Comm_split, grid communicators,
- parallel architectures: fine grain versus coarse grain parallelism, Flynn's taxonomy, SIMD, vector machines, array processors, MIMD, uniform shared memory, nonuniform shared memory, distributed memory, - tradeoffs
- performance evaluation of parallel programs: speedup, efficiency, performance curves and how to read and interpret them, measuring running time, concepts from handout
- high level questions from student oral presentations

3 Format of Exam

The exam is closed book, closed neighbor and you will have the full final exam period to work. You will be given a list of MPI commands with their parameters for reference. In general, the exam will be a combination of testing your basic knowledge and understanding of the concepts covered in class and application of the concepts. The questions will be chosen from the following forms:

- Short answer.
- Explain what will happen when a particular code segment is executed.
- Show what the storage for each process will look like after some set of commands is executed.
- Write a short (5-10) line MPI program, given a list of MPI commands with parameters.
- true/false with explanations of why false
- Interpret a performance evaluation graph
- Draw a simple picture to demonstrate particular parallel architecture
- Analyze a code segment for overlapping communication and computation
- Draw a Cartesian topology constructed from a given small code segment
- Compute performance numbers given some measurements
- most likely matching/fill in the blank from student presentations

Partial credit will be given when possible on any question in the exam.

4 How to Study

Review your lecture notes, labs, and textbook chapters. Write some code segments with each of the MPI constructs to be covered, to make sure you understand how to pass the proper parameters. Try some problems of the form above for topics covered in class.