CARLETON UNIVERSITY

School of Computer Science

COMP 5105 Parallel Processing Systems

Fall 2005

Project Description

Due: December 5, 2005

Matrix multiplication

The three main objectives of this project are:

- To provide introduction to parallel programming;
- To give some exposure to load sharing;
- To study computation versus communication issues in programming on networks of workstations.

To meet these objectives, write a program to multiply two matrices using PVM or MPI. For simplicity, you can assume that the matrix size is a multiple of the number of machines. Your solution should implement the dynamic load sharing discussed in class.

Data collection
You should collect timing data for various number of workstations, matrix sizes etc. The timing should include the time to distribute the matrices to nodes and to collect results.

Discussion
You should not simply present the data. You should explain the data you obtained (e.g., speedup you obtained, impact of communication and computation etc.). Use your judgment in devising further experiments as necessary.

Your discussion should also answer questions like:
What is the impact of granularity? How communication (size and frequency) affects performance? What are the conclusions of this study?

Notes

1. Writing a correct program gives only 50% of the credit.
2. Experimental design, presentation and discussion of results are as important.
3. Read the instructions on the course web page to set up PVM if you are planning to use PVM.
4. Read the instructions on the course web page to set up MPI if you are planning to use MPI.