

CS 4970 - Parallel Programming

Assignment 2 - Due 2021.09.01

Overview: The purpose of this assignment is to construct a program which will simulate a multiple-round guessing game.

Details:

In the first week of class, we examined and compiled the .cpp file: `MPI_sendrecv_example.cpp`. You are to modify this program to do the following:

- (a) Each process will store in the variable *value* the square of their rank.
- (b) Create a new integer variable called *rvalue* which is initialized to zero.
- (c) Each process is to send its variable *value* to the next process, which will store this in its variable *rvalue*.
- (d) The values of *value* and *rvalue* will be printed out for each process both before and after the send/recv.

As an example – process 3 will have *value* set to $3^2 = 9$. It will send this value to process 4 which will store it in its variable *rvalue*. Also, process 3 will receive process 2's *value* (which is 4) and it will be stored in process 3's variable *rvalue*.

Note the special circumstance where process 0 receives process (size-1)'s value and stores it in *rvalue* while at the same time, process (size-1) sends its *value* variable to process 0's *rvalue* variable. As an example of this, if the world size is 40 (this is the *n* in the job file), then process 39 should send its *value* to process 0, and process 0 should receive this and store it in *rvalue*.

Your program should output the variables *value* and *rvalue* before and after the MPI send and MPI recv commands, similar to what we have been doing so far. Be sure to document your code, run it a few times, and be ready to show the output files along with the .cpp of your actual program on class Monday!