CS-5379: Parallel Processing

Spring Semester 2017

Department of Computer Science

Texas Tech University

Assignment-01

**GROUP MEMBERS**

Amitsingh Pardeshi and Md Raihan Majumder

**Problem Statement**

Write a code which demonstrates the parallel processing along with overlapping. The root process (rank == 0) is responsible for generating data and sending it across the other processes. Other processes will receive data and will perform sum operation of each row received and it will print the computed sum on the console.

**Solution Approach**

The root process will generate the data and populate the two dimensional array with the random numbers. The root process will generate and send the data to other receiving processes simultaneously. The root process will send the data in the form of chunks (100 rows form one chunk). So the receiving processes will receive two chunks of 100 rows each. In totality there are 6 receiving processes hence each receiving process will get 200 rows and it will compute the sum of each received row which will be printed on the console.

**Algorithm**.

* Initialized 1200 by 1200 two dimensional array.
* If rank is 0

Then call **populateData(rowNumber)** function // This function takes the starting row number as input and populate next 100 rows in the array

// send chunk of 100 rows to receiving processes

Call **MPI\_Isend**

rowNum = rowNum + 100;

Then call **populateData(rowNumber)** function

Then again call **populateData(rowNumber)** function

Else // rank is other than 0

Receive the first chunk of 100 rows using Mpi\_Irecv

Call MPI\_Wait() for first chunk

Receive the second chunk of 100 rows using Mpi\_Irecv

Compute the sum for first chunk of 100 rows and print result

Call MPI\_Wait() for second chunk

Compute the sum for second chunk of 100 rows and print result

**Submission**

The submission contains a source code file named **“assignment\_1\_compute.cpp”,** a log file named “**log.txt”** anda report file named **“assignment.docx”**

**Execution**

**>msmpi –n 7 assignment\_\_compute.exe > log.txt**