Assignment No.3

# Problem Statement:

Develop a distributed system, to find sum of N elements in an array by distributing N/n elements to n number of processors MPI or OpenMP. Demonstrate by displaying the intermediate sums calculated at different processors.

# Code:

import mpi.MPI;

public class ScatterGather {

public static void main(String args[]){

//Initialize MPI execution environment MPI.Init(args);

//Get the id of the process

int rank = MPI.COMM\_WORLD.Rank();

//total number of processes is stored in size int size = MPI.COMM\_WORLD.Size();

int root=0;

//array which will be filled with data by root process int sendbuf[]=null;

sendbuf= new int[size];

//creates data to be scattered if(rank==root){

sendbuf[0] = 10;

sendbuf[1] = 20;

sendbuf[2] = 30;

sendbuf[3] = 40;

//print current process number System.out.print("Processor "+rank+" has data: "); for(int i = 0; i < size; i++){

System.out.print(sendbuf[i]+" ");

}

System.out.println();

}

//collect data in recvbuf int recvbuf[] = new int[1];

//following are the args of Scatter method

//send, offset, chunk\_count, chunk\_data\_type, recv, offset, chunk\_count, chunk\_data\_type, root\_process\_id

MPI.COMM\_WORLD.Scatter(sendbuf, 0, 1, MPI.INT, recvbuf, 0, 1, MPI.INT, root); System.out.println("Processor "+rank+" has data: "+recvbuf[0]); System.out.println("Processor "+rank+" is doubling the data"); recvbuf[0]=recvbuf[0]\*2;

//following are the args of Gather method

//Object sendbuf, int sendoffset, int sendcount, Datatype sendtype,

//Object recvbuf, int recvoffset, int recvcount, Datatype recvtype,

//int root)

MPI.COMM\_WORLD.Gather(recvbuf, 0, 1, MPI.INT, sendbuf, 0, 1, MPI.INT, root);

//display the gathered result if(rank==root){

System.out.println("Process 0 has data: "); for(int i=0;i<4;i++){

System.out.print(sendbuf[i]+ " ");

}

}

//Terminate MPI execution environment MPI.Finalize();

}

}

# OUTPUT:

