Lab Submission – 11

Arnab Mondal

20BCE1294

Program: B.Tech

Semester: Fall 2022-23

Course: CSE4001 – Parallel and Distributed Computing

Faculty: Dr. Sudha A

Date: 17-10-2022

Exercise: 11

1. Use Gather to get array 0f [30] where p1 has a1[10], p2 has a2[10] and p3 has a3[10].
2. Use Reduce to compute sum of 10 elements

Gather:

Code:

```c
#include <mpi.h>

#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <mpi.h>

//using namespace std;

int main(int argc, char** argv)

{
```

```c
int i,j,k,p,a[30],b[10],c[10], d[10],myrank,res,x,y,interval,sum = 0;


for(i=0;i<10;i++)

{

    b[i] = i;

    c[i] = i;

    d[i] = i;

}


MPI_Status status;

MPI_Init(&argc, &argv);

MPI_Comm_rank(MPI_COMM_WORLD, &myrank);

MPI_Comm_size(MPI_COMM_WORLD, &p);


MPI_Gather(&b,10,MPI_INT, a, 10,MPI_INT,0,MPI_COMM_WORLD);

MPI_Gather(&c,10,MPI_INT, a, 10,MPI_INT,0,MPI_COMM_WORLD);

MPI_Gather(&d,10,MPI_INT, a, 10,MPI_INT,0,MPI_COMM_WORLD);


if(myrank == 0)

{

    for(i=0;i<30;i++)

        printf("%d ",a[i]);

}


MPI_Finalize();
```
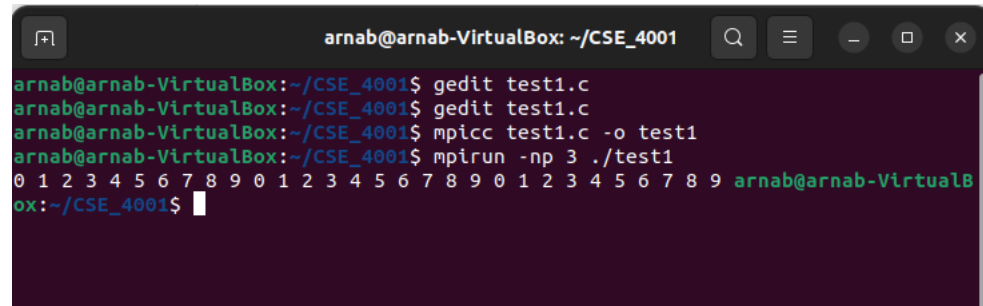
```
    return 0;

}
```

Output:

Code:

```c
#include<stdio.h>

#include<stdlib.h>

#include<mpi.h>

#include<unistd.h>

int main(int argc,char **argv){

  int np,myrank;

  int sum = 0;

  for(int i = 0;i < 10;i++){

    sum = sum + i;

  }

  MPI_Status status;

  MPI_Init(&argc,&argv);

  MPI_Comm_rank(MPI_COMM_WORLD,&myrank);

  MPI_Comm_size(MPI_COMM_WORLD,&np);

  int final_sum = 0;
```

```c
MPI_Reduce(&sum,&final_sum,1,MPI_INT,MPI_SUM,0,MPI_COMM_WORLD);

if(myrank == 0){

  printf("Sum: %d\n",final_sum);

}

MPI_Finalize();

return 0;

}
```
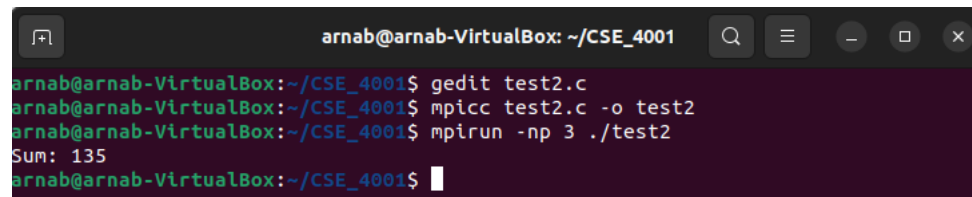
Output:

arnab@arnab-VirtualBox: ~/CSE_4001

```
arnab@arnab-VirtualBox:~/CSE_4001$ gedit test2.c
arnab@arnab-VirtualBox:~/CSE_4001$ mpicc test2.c -o test2
arnab@arnab-VirtualBox:~/CSE_4001$ mpirun -np 3 ./test2
Sum: 135
arnab@arnab-VirtualBox:~/CSE_4001$
```