Final Year B. Tech., Sem VII 2022-23

High Performance Computing Lab

PRN: 2020BTECS00206

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Batch: B4

Assignment No. 5

Complete the installation of MPI on the platform chosen by you.

Installation of MPI:

```
$ sudo apt install mpich
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libmpich-dev
Suggested packages:
  mpich-doc
The following NEW packages will be installed:
  libmpich-dev mpich
0 upgraded, 2 newly installed, 0 to remove and 5 not upgraded.
Need to get 7,571 kB of archives.
After this operation, 60.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 mpich amd64 4.0-3 [197 kB]
```

Q1. Implement a simple hello world program by setting number of processes equal to 10.

```
#include <mpi.h>
#include <stdio.h>
int main( int argc, char *argv[] )
{
   MPI_Init( &argc, &argv );
   printf("Hello, world!\n");
   return 0;
}
```

```
$ mpirun -np 10 ./a.out
Hello, world!
Hello, world!Hello, world!
Hello, world!
Hello, world!

Hello, world!
Hello, world!Hello, world!
Hello, world!

Hello, world!
```

Q2. Implement a program to display rank and communicator group of five processes.

```
#include <mpi.h>

#include <stdio.h>

int main( int argc, char *argv[] )

{

   MPI_Init( &argc, &argv );

   int rank;

   MPI_Group group;

   MPI_Comm_group(MPI_COMM_WORLD, &group);

   MPI_Comm_rank(MPI_COMM_WORLD, &rank);

   printf("Rank: %d, Group: %d \n", rank, group);

   MPI_Finalize();

   return 0;

}
```

```
$ mpirun -np 10 ./a.out
Rank: 1, Group: -2013265920
Rank: 2, Group: -2013265920
Rank: 3, Group: -2013265920
Rank: 6, Group: -2013265920
Rank: 7, Group: -2013265920
Rank: 5, Group: -2013265920
Rank: 9, Group: -2013265920
Rank: 8, Group: -2013265920
Rank: 4, Group: -2013265920
Rank: 0, Group: -2013265920
```

Github Link: https://github.com/SayaliDesai4/HPC-Practicals
