**Class:** Final Year (Computer Science and Engineering)

**Year:** 2022-23 **Semester:** 1

**Course:** High Performance Computing Lab

**Practical No. 5**

**Exam Seat No: 2019BTECS00037**

**Title of practical: Study of MPI**

**Problem Statement 1: : 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[] )*

*{*

*int rank, size;*

*MPI\_Init( &argc, &argv );*

*MPI\_Comm\_rank( MPI\_COMM\_WORLD, &rank );*

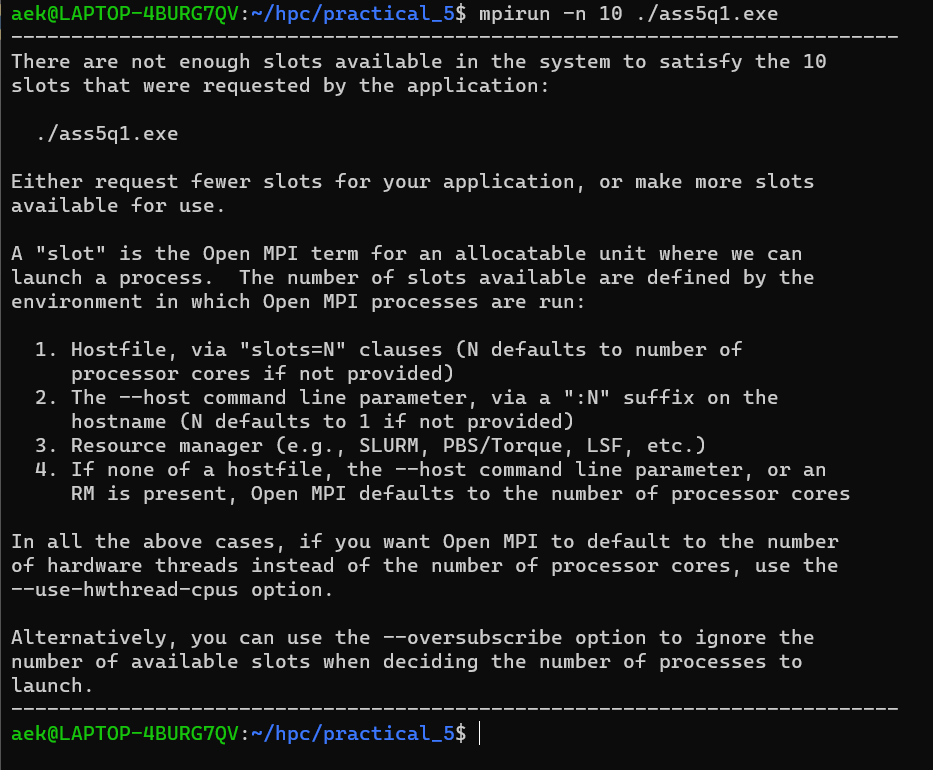
*MPI\_Comm\_size( MPI\_COMM\_WORLD, &size );*

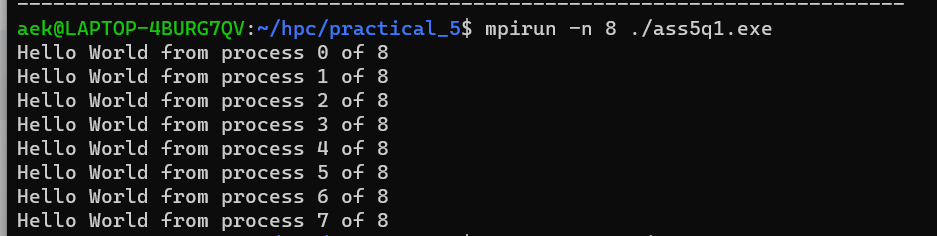
*printf( "Hello World from process %d of %d\n", rank, size );*

*MPI\_Finalize();*

*return 0;*

*}*

**

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**Problem Statement 2: 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(NULL, NULL);*

*int world\_size;*

*MPI\_Comm\_size(MPI\_COMM\_WORLD, &world\_size);*

*int world\_rank;*

*MPI\_Comm\_rank(MPI\_COMM\_WORLD, &world\_rank);*

*int color = world\_rank / 2;*

*MPI\_Comm row\_comm;*

*MPI\_Comm\_split(MPI\_COMM\_WORLD, color, world\_rank, &row\_comm);*

*int row\_rank, row\_size;*

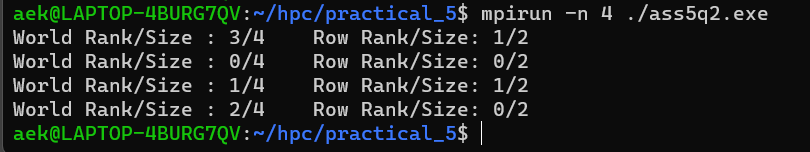
*MPI\_Comm\_rank(row\_comm, &row\_rank);*

*MPI\_Comm\_size(row\_comm, &row\_size);*

*printf("World Rank/Size : %d/%d \t Row Rank/Size: %d/%d\n", world\_rank, world\_size, row\_rank, row\_size);*

*MPI\_Finalize();*

*}*

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**Github Link:**

[**https://github.com/OnkarGavali/HPC\_Lab/tree/main/Practical\_No5**](https://github.com/OnkarGavali/HPC_Lab/tree/main/Practical_No5)