

Aryaman Mishra

19BCE1027

LAB 6

1. Simple hello world mpi

```
#include<stdio.h>

#include <mpi.h>

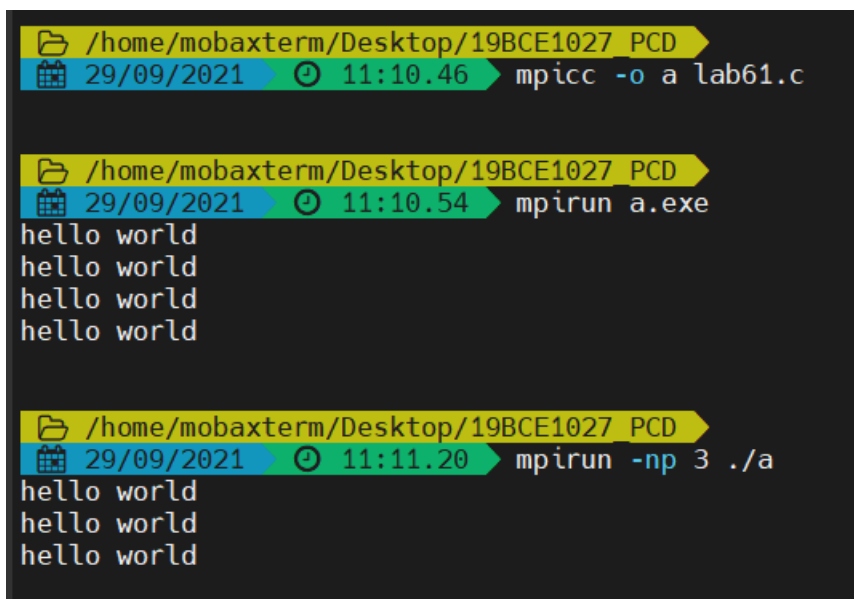
int main()

{

printf("hello world\n");

return 0;

}
```



```
/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:10.46 mpicc -o a lab61.c

/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:10.54 mpirun a.exe
hello world
hello world
hello world
hello world

/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:11.20 mpirun -np 3 ./a
hello world
hello world
hello world
```

2. Getting started with MPI program

```
#include <mpi.h>
#include <stdio.h>

int main(int argc, char** argv) {
    // Initialize the MPI environment
    MPI_Init(NULL, NULL);
```

```

// Get the number of processes
int world_size;
MPI_Comm_size(MPI_COMM_WORLD, &world_size);

// Get the rank of the process
int world_rank;
MPI_Comm_rank(MPI_COMM_WORLD, &world_rank);
// Get the name of the processor
char processor_name[MPI_MAX_PROCESSOR_NAME];
int name_len;
MPI_Get_processor_name(processor_name, &name_len);

// Print off a hello world message
printf("Hello world from processor %s, rank %d out of %d processors\n",
       processor_name, world_rank, world_size);

// Finalize the MPI environment.
MPI_Finalize();
return 0;
}

```

```

/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:11.51 mpicc -o a lab62.c

/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:12.51 ./a
Hello world from processor LAPT0P-B45MQN7C, rank 0 out of 1 processors

/home/mobaxterm/Desktop/19BCE1027 PCD
29/09/2021 11:13.04 mpirun -np 4 ./a
Hello world from processor LAPT0P-B45MQN7C, rank 0 out of 4 processors
Hello world from processor LAPT0P-B45MQN7C, rank 1 out of 4 processors
Hello world from processor LAPT0P-B45MQN7C, rank 2 out of 4 processors
Hello world from processor LAPT0P-B45MQN7C, rank 3 out of 4 processors

```

3. Write a MPI program that will print your name along with all processes with odd ranks.

```
#include <mpi.h>
```

```
#include <stdio.h>
```

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

```

// Initialize the MPI environment

MPI_Init(NULL, NULL);


// Get the number of processes

int world_size;

MPI_Comm_size(MPI_COMM_WORLD, &world_size);


// Get the rank of the process

int world_rank;

MPI_Comm_rank(MPI_COMM_WORLD, &world_rank);

// Get the name of the processor

char processor_name[MPI_MAX_PROCESSOR_NAME];

int name_len;

MPI_Get_processor_name(processor_name, &name_len);


// Print off a hello world message

//printf("Hello world from processor %s, rank %d out of %d processors\n",
    //processor_name, world_rank, world_size);

if(world_rank%2==0)
{
    printf("Hello world from processor %s, rank %d out of %d
processors\n",processor_name, world_rank, world_size);
}

else
{

```

```
        printf("Aryaman Mishra 19BCE1027 from processor %s, rank %d out of %d\n",processor_name, world_rank, world_size);

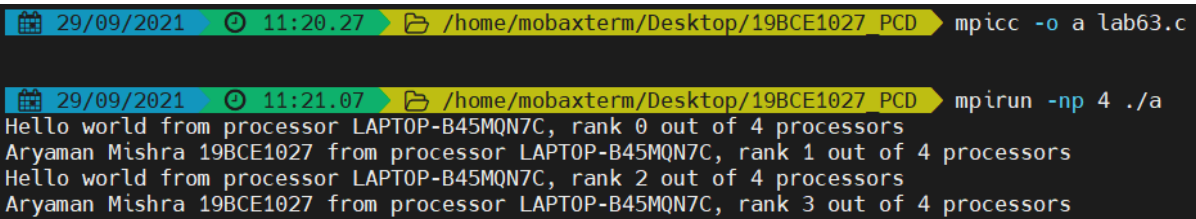
    }

    // Finalize the MPI environment.

    MPI_Finalize();

    return 0;

}
```



The screenshot shows a terminal window with a dark background. The top bar displays the date '29/09/2021', time '11:20.27', and the current directory path '/home/mobaxterm/Desktop/19BCE1027_PCD'. The command 'mpicc -o a lab63.c' is entered and executed. The second line shows the date '29/09/2021', time '11:21.07', and the same directory path. The command 'mpirun -np 4 ./a' is entered and executed. The output shows four lines of text, each from a different rank (0, 1, 2, 3) of 4 processors, all reporting the same message: 'Hello world from processor LAPTOP-B45MQN7C, rank X out of 4 processors' where X is the rank number.

```
29/09/2021 11:20.27 /home/mobaxterm/Desktop/19BCE1027_PCD mpicc -o a lab63.c
29/09/2021 11:21.07 /home/mobaxterm/Desktop/19BCE1027_PCD mpirun -np 4 ./a
Hello world from processor LAPTOP-B45MQN7C, rank 0 out of 4 processors
Aryaman Mishra 19BCE1027 from processor LAPTOP-B45MQN7C, rank 1 out of 4 processors
Hello world from processor LAPTOP-B45MQN7C, rank 2 out of 4 processors
Aryaman Mishra 19BCE1027 from processor LAPTOP-B45MQN7C, rank 3 out of 4 processors
```