Computer Science & Engineering

CSE4001

Parallel and Distributed Computing

LAB ASSIGNMENT 8

Submitted to **Prof. DEEBAK B.D.**

TOPIC: PROBLEMS USING MPI

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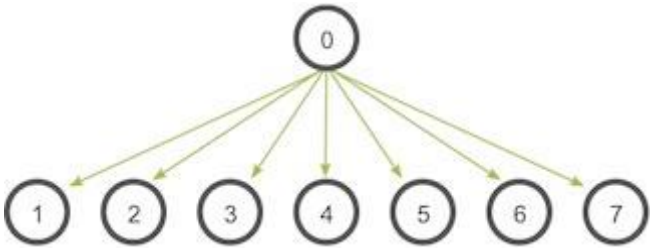
DATE: 23/11/2021

QUESTION – I

Write a 'C' program to initialize the communication pattern of a broadcast. The code logic can typically have a process zero [as root], which has the initial copy of the data to broadcast to other processes [as shown in the below figure].



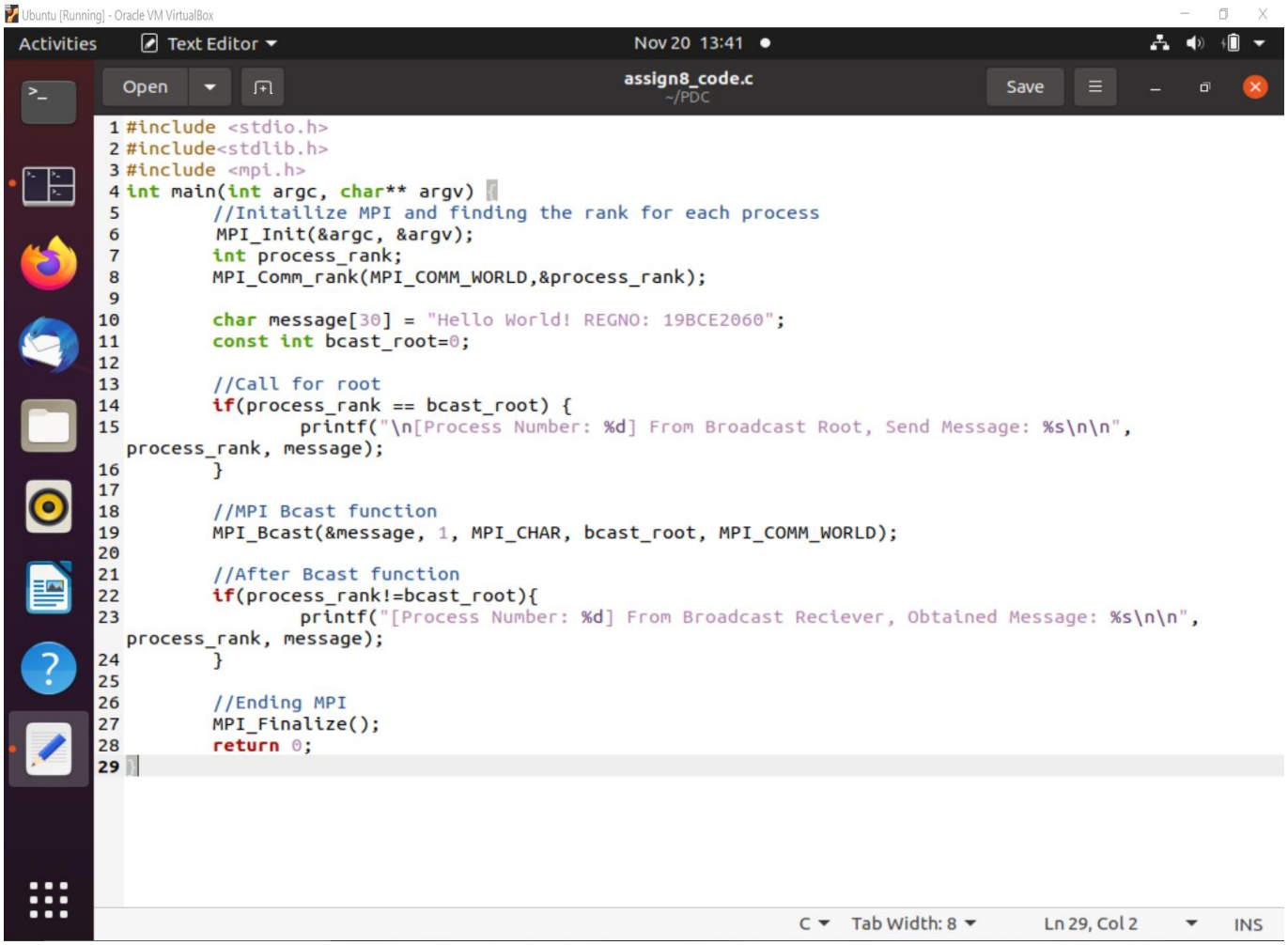
Hint: The function prototype is as follows:

```
MPI_Bcast(
        void* data,
        int count,
        MPI_Datatype datatype,
        int root,
        MPI_Comm communicator)
```

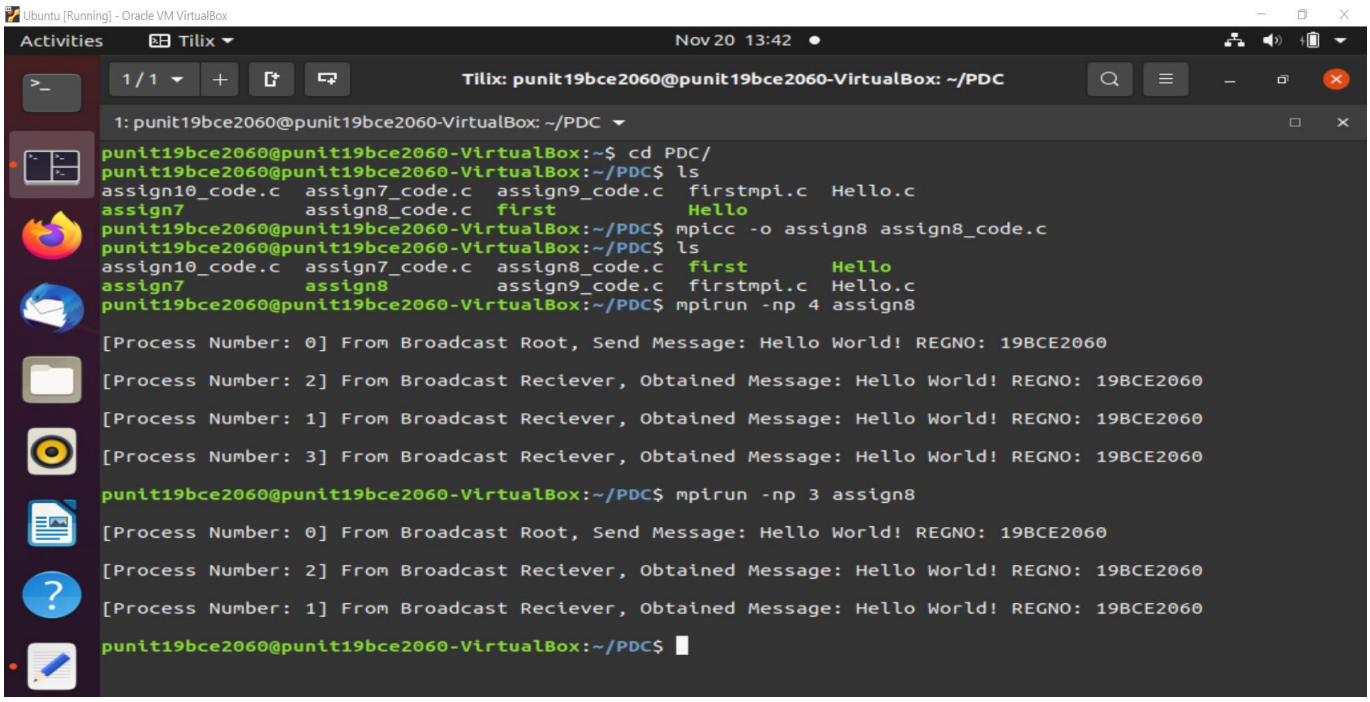
SOURCE CODE:

```
#include <stdio.h>
#include<stdlib.h>
#include <mpi.h>
int main(int argc, char** argv) {
//Initailize MPI and finding the rank for each process
        MPI_Init(&argc, &argv);
int process_rank;
MPI_Comm_rank(MPI_COMM_WORLD,&process_rank);

char message[30] = "Hello World! REGNO: 19BCE2060";
const int bcast_root=0;

//Call for root
if(process_rank == bcast_root) {
printf("\n[Process Number: %d] From Broadcast Root, Send Message: %s\n\n",
process_rank, message);
}

//MPI Bcast function
```

```
MPI_Bcast(&message, 1, MPI_CHAR, bcast_root, MPI_COMM_WORLD);

//After Bcast function
if(process_rank!=bcast_root){
printf("[Process Number: %d] From Broadcast Reciever, Obtained Message:
%s\n\n", process_rank, message);
}

//Ending MPI
MPI_Finalize();
return 0;
}
```



EXECUTION:



REMARKS:

- ✓ There are four processes in total, with the bcast root set to process 0.
- ✓ When the process rank is 0, a message "`Hello World! REGNO: 19BCE2060`" is sent from root to all other processes 1, 2, and 3.
- ✓ This message is broadcasted using the MPI Bcast function.
- ✓ It sends a message to all other communicator processes from the process with the rank "root," i.e., process 0 in this case.
- ✓ We can observe that the message is sent from process 0 to processes 1, 2, and 3 during execution.