Exercise 5 (MPI – II)

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Question-1: MPI Broadcast

Code : -

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


int main(argc,argv)
int argc;
char *argv[];
{
    int i,myid, numprocs;
    int source,count;
    int buffer[4];
    MPI_Status status;
    MPI_Request request;

    MPI_Init(&argc,&argv);
    MPI_Comm_size(MPI_COMM_WORLD,&numprocs);
    MPI_Comm_rank(MPI_COMM_WORLD,&myid);
    source=0;
    count=4;
    if(myid == source){
      for(i=0;i<count;i++)
        buffer[i]=i;
    }
    MPI_Bcast(buffer,count,MPI_INT,source,MPI_COMM_WORLD);
    for(i=0;i<count;i++)
      printf("%d ",buffer[i]);
    printf("\n");
    MPI_Finalize();
}
```

OUTPUT : -

```
knt@knt-Inspiron-15-3567:~/Desktop$ mpicc hello.c -o hello
knt@knt-Inspiron-15-3567:~/Desktop$ mpirun -np 4 ./hello
0 1 2 3
0 1 2 3
0 1 2 3
0 1 2 3
knt@knt-Inspiron-15-3567:~/Desktop$
```

Question-2: MPI Send Receive

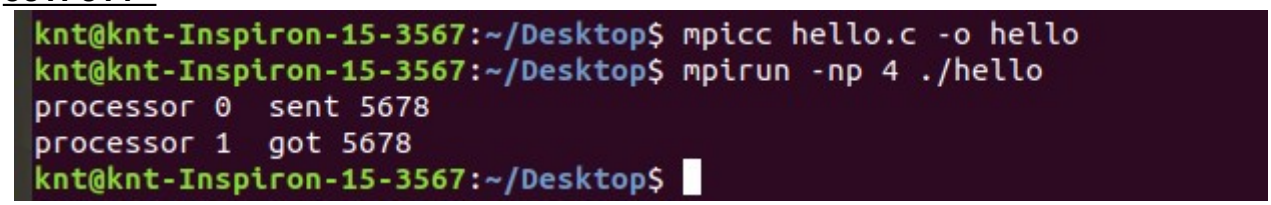
Code : -

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

```
int main(argc,argv)
int argc;
char *argv[];
{
    int myid, numprocs;
    int tag,source,destination,count;
    int buffer;
    MPI_Status status;

    MPI_Init(&argc,&argv);
    MPI_Comm_size(MPI_COMM_WORLD,&numprocs);
    MPI_Comm_rank(MPI_COMM_WORLD,&myid);
    tag=1234;
    source=0;
    destination=1;
    count=1;
    if(myid == source){
      buffer=5678;
      MPI_Send(&buffer,count,MPI_INT,destination,tag,MPI_COMM_WORLD);
      printf("processor %d  sent %d\n",myid,buffer);
    }
    if(myid == destination){
        MPI_Recv(&buffer,count,MPI_INT,source,tag,MPI_COMM_WORLD,&status);
        printf("processor %d  got %d\n",myid,buffer);
    }
    MPI_Finalize();
}
```

OUTPUT:-



Question-3: MPI Calculate Size of Incoming Message

Code:-

```
#include <stdio.h>
#include <stdlib.h>
#include <mpi.h>
#include <math.h>
int main(int argc,char **argv)
{
    int myid, numprocs;
    MPI_Status status;
    int mytag,ierr,icount,j,*i;

    MPI_Init(&argc,&argv);
    MPI_Comm_size(MPI_COMM_WORLD,&numprocs);
    MPI_Comm_rank(MPI_COMM_WORLD,&myid);
    printf(" Hello from c process: %d  Numprocs is %d\n",myid,numprocs);

    mytag=123;
    if(myid == 0) {
        j=200;
        icount=1;
        ierr=MPI_Send(&j,icount,MPI_INT,1,mytag,MPI_COMM_WORLD);
    }
```

```
    if(myid == 1){
        ierr=MPI_Probe(0,mytag,MPI_COMM_WORLD,&status);
        ierr=MPI_Get_count(&status,MPI_INT,&icount);
        i=(int*)malloc(icount*sizeof(int));
        printf("getting %d\n",icount);
            ierr = MPI_Recv(i,icount,MPI_INT,0,mytag,MPI_COMM_WORLD,&status);
        printf("i= ");
        for(j=0;j<icount;j++)
                printf("%d ",i[j]);
        printf("\n");
    }
    MPI_Finalize();
}
```

OUTPUT:-

```
knt@knt-Inspiron-15-3567:~/Desktop$ mpicc hello.c -o hello
knt@knt-Inspiron-15-3567:~/Desktop$ mpirun -np 4 ./hello
 Hello from c process: 0  Numprocs is 4
 Hello from c process: 1  Numprocs is 4
 Hello from c process: 2  Numprocs is 4
 Hello from c process: 3  Numprocs is 4
getting 1
i= 200
knt@knt-Inspiron-15-3567:~/Desktop$
```