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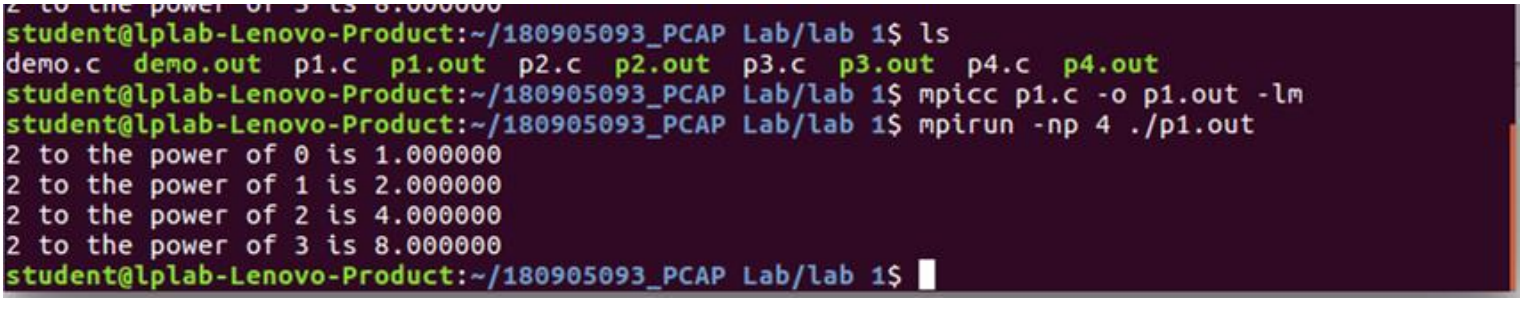
PP_Lab - Batch 1

P1)

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

int main(int argc, char** argv) {
    int x = 2;
    // Initialize the MPI environment
    MPI_Init(NULL, NULL);


    int size;
    MPI_Comm_size(MPI_COMM_WORLD, &size);


    int rank;
    MPI_Comm_rank(MPI_COMM_WORLD, &rank);

    double P = pow(x , rank);
    printf("%d to the power of %d is %f \n" , x , rank , P);



    // Finalize the MPI environment.
    MPI_Finalize();
}
```

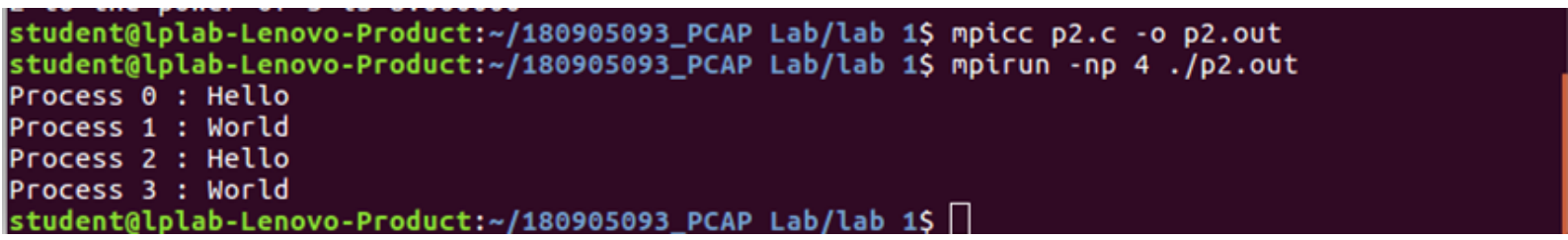
Screen Shot of P1 Execution in Terminal :



P2)

```
#include<stdio.h>
#include "mpi.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);
   if(rank%2==0)
      printf("Process %d : Hello\n",rank);
   else
      printf("Process %d : World\n",rank);



   MPI_Finalize();
   return 0;
}
```

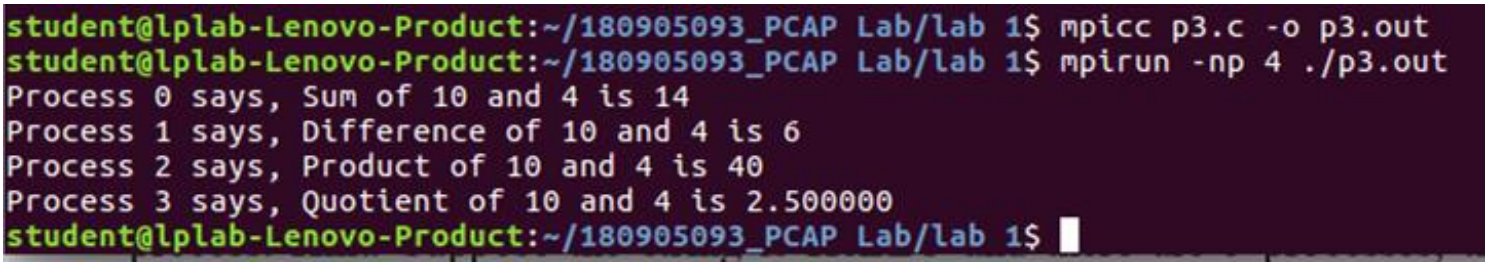
Screen Shot of P2 Execution in Terminal :



P3)

```
#include <mpi.h>
#include <stdio.h>
#include <math.h>
int main(int argc, char* argv[]) {
   int rank, size,a=10,b=4;
   MPI_Init(&argc,&argv);
   MPI_Comm_rank(MPI_COMM_WORLD, &rank);
   MPI_Comm_size(MPI_COMM_WORLD, &size);
   if(rank == 0)
      printf("Process %d says, Sum of %d and %d is %d\n",rank,a,b,a + b);
   if (rank == 1)
      printf("Process %d says, Difference of %d and %d is %d\n", rank, a, b, a - b);
   if (rank == 2)
      printf("Process %d says, Product of %d and %d is %d\n", rank, a, b, a * b);
   if (rank == 3)
      printf("Process %d says, Quotient of %d and %d is %f\n", rank, a, b, (double)a / b);
   MPI_Finalize();
   return 0;
}
```

Screen Shot of P3 Execution in Terminal :



P4)

```
#include <mpi.h>
#include <stdio.h>
#include <math.h>
int main(int argc, char* argv[]) {
   int rank, size;
   char str[6] = "HeLLo";
   MPI_Init(&argc,&argv);
   MPI_Comm_rank(MPI_COMM_WORLD, &rank);
   MPI_Comm_size(MPI_COMM_WORLD, &size);
   if (str[rank] >= 'a' && str[rank] <= 'z')
      str[rank] = str[rank] - 32;
   else
      str[rank] = str[rank] + 32;
   printf("Process % d says, Modified string is %s\n",rank,str);
   MPI_Finalize();
   return 0;
}
```

Screen Shot of P4 Execution in Terminal :