Parallel Programing: HW1

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MPI Installation

I currently have Pop OS on my machine which is a Debian derivative. I used the command:

```
sudo apt install openmpi-*
```

This command allowed me to install openmpi-bin, openmpi-common, and openmpi-doc onto my machine.

Code:

Listing 1: main.cpp

```
#include <iostream>
#include <mpi.h>
#include <unistd.h>
#include <stdlib.h>

//#include "/usr/local/include/mpi.h"
#define MCW MPI_COMM_WORLD

using namespace std;

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

    int rank, size;
    int data;
    MPI_Init(&argc, &argv);
    MPI_Comm_rank(MCW, &rank);
    MPI_Comm_size(MCW, &size);

    MPI_Send(&rank,1,MPI_INT,(rank+1)%size,0,MCW);
    MPI_Recv(&data,1,MPI_INT,MPI_ANY_SOURCE,0,MCW,MPI_STATUS_IGNORE);

    cout<<"I am "<<rank<<" of "<<size<<"; got a message from "<<data<<endl;
```

```
    MPI_Finalize();

    return 0;
}
```

How to run:

```
mpic++ hello_world.cpp -o main
mpirun -np 4 -oversubscribe ./main
```

Output

```
I am 2 of 4; got a message from 1
I am 3 of 4; got a message from 2
I am 0 of 4; got a message from 3
I am 1 of 4; got a message from 0
```

Order of lines may vary due to parallel processing variability.