MPI Ring Communication

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Exercise 5

Objective

The objective of this exercise is to understand the **ring communication** between all the processes first by using **single element** and by **large sets of data** via **non-blocking communication**.

Result

Here, we send the **process id** of each process to the next process in a ring pattern and add them together. Finally, we send the sum to all the processes like **MPI_Allreduce** function.

```
[nsakthiv@login2 Parallel_Programming]$ mpirun -np 4 exercise5
id:0 -> 6
id:1 -> 6
id:2 -> 6
id:3 -> 6
```

Figure 1: Ring communication of Process Id

```
[nsakthiv@login2 Parallel_Programming]$ mpirun -np 4 exercise5_vector 4
id:0 -> 24
id:1 -> 24
id:2 -> 24
id:3 -> 24
```

Figure 2: Ring communication of large sets of data

MPI_Allreduce function is basically the combination of **MPI_Reduce** and **MPI_Bcast** function. We optimised the program to support large sets of data.

Conclusion

From the exercise, we can understand that the **non blocking communication** overlaps communication and computation which makes it efficient for large sets of data.