

Lab Report- 7

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Message Passing interface as the name suggests is a message passing implementation for parallel programming which provides in-built methods for passing messages among the various threads.

The given questions in the assignment provide an in-depth experience of how MPI works.

Since this is my first time working on MPI, I struggled a lot with the lab initially.

Simple.c was a great introduction to the MPI capabilities. I had a hard time initially to understand how the MPI is working. While MPI works in a swift manner, whenever I tried to tinker with the programs to know the flow, it kept giving me error for cannot ssh to another terminal. Then, when I figured out that the programs had to running on the same server, then it all started to make sense.

In the first question itself, while programming the ring.c program, I was getting stuck in an infinite loop. This was due to the fact that I was not considering the use of rank 0 for ending along with the condition for rank not equal to 0 was being wrongly run.

After adding another if statement to sort out the rank-0 problem, I had to figure out the way to reduce the value of N every time it was used.

After figuring that out, I was able to properly run the code.

Vecsum.c was a great implementation example for parallel sum calculation. It gave me an insight into the functions of MPI.

As for the collective communication part, while I was able to figure out which routines to use where for scan.c and it is working as expected.

The use of gather makes calculation of total sum very easy and the callback nature of the gather call makes it super efficient to collect the result and use it to print the result on the console.

There was a major problem with the scatter.c though.

I have implemented all the necessary steps from part a to e but the program goes into an infinite loop.

The only reason for this to happen is due to the wrong parameters being used in the scatter.c's scatterv function.

When I inspected it closely, there was a big problem with the parameters. The parameter rbuf which had to be used repeatedly to calculate the requisite result was being wrongly passed.

This is because of the wrong placement of the scatterv statement in the flow of the program.

Also the fact that we have 0 as TAG might also lead to these kinds of serious issues.

But in the end, I was able to correctly rectify the mistake and was able to run the program properly.

This was a great learning experience for me as I was enabled to learn more and more about MPI.