Assignment 3

Part a - Setting up a cluster with MPICH

Use MPICH (an implementation of the MPI standard). Refer to https://mpitutorial.com/

Set up the cluster and Execute hello world application
Configure the simplest possible **Beowulf cluster** out of two or three laptops running Linux connected to a local network using MPICH:

1. Install mpich:

   $sudo apt-get install mpich

2. Set up the cluster on LAN:

   https://mpitutorial.com/tutorials/running-an-mpi-cluster-within-a-lan/

3. MPI Hello world:

   https://mpitutorial.com/tutorials/mpi-hello-world/

What to submit:
The screenshots of output from all the systems in the cluster

Part b - Adding a large set of numbers in parallel using MPI on a cluster

Try the sample programs for communication primitives and create an application for adding a large set of numbers

Try out basic point-to-point and collective communication primitives offered by MPI:
https://mpitutorial.com/tutorials/mpi-send-and-receive/
https://mpitutorial.com/tutorials/mpi-broadcast-and-collective-communication/
https://mpitutorial.com/tutorials/mpi-scatter-gather-and-allgather/
https://mpitutorial.com/tutorials/mpi-reduce-and-allreduce/

Generate a very large array of integers and create a cluster application to find the sum of the numbers. There are different choices of communication primitives:

a. P2P (point-to-point) communication - **MPI_Send and MPI_Recv**
b. Collective Communication - **MPI_Scatter, MPI_Gather and MPI_Reduce**.

Select any one way of communication for the exercise.

What to submit:

a. The .c files for each program.
b. A word doc or pdf containing screenshots of the output

Evaluation:
In addition to submitted the required files, each group MUST show a demo