Parallel Computing by Y. Deng

Project 1

Due: September 29 (Sunday), 2024 at 11:59 pm.

Please read the Common Projects Instructions before doing any problems.

Problem 1.1

When running a parallel program on P processors to write out "Hello from Processor X" to you (who has one series way to receive the write out), the order is non-deterministic when you run the same program on the same system, multiple times.

For example, when running on a system of $P = 10$, you get the following print out:
>Hello from Processor 3
>Hello from Processor 9
>Hello from Processor 8
>…
>Hello from Processor 0

Next time, repeating the same program again on the same computer, you get
>Hello from Processor 0
>Hello from Processor 8
>Hello from Processor 7
>…
>Hello from Processor 4

This non-deterministic feature is sometimes undesirable and, too, rectifiable. Write a parallel program to rectify, i.e., whenever running your program, you always get the system to write out in a desired/fixed order, e.g.,
>Hello from Processor 0
>Hello from Processor 1
>Hello from Processor 2
>…
>Hello from Processor 9

You may test it for a system with at least 13 processors.

One example of revealing many differences of parallel programs from the sequential ones.