CX 4220/CSE 6220 High Performance Computing
Programming Assignment 1 report
Submitted Wednes, February 8

Team members: Hailey Ho, Samuel Eichner, Takahiro Furuya

The plot of runtime against numbers of processors is as follows: The x axis is in log-scale,

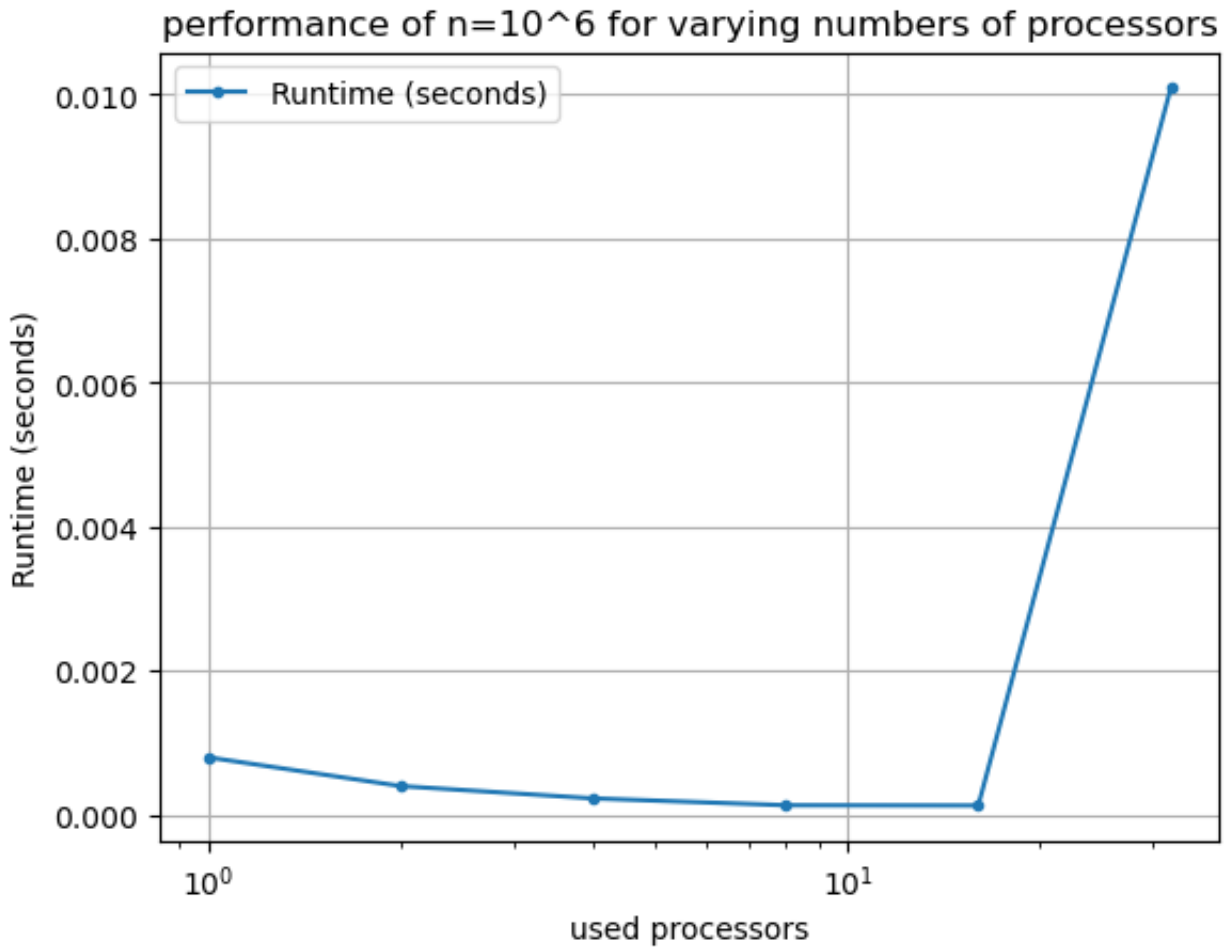

Figure 1: Runtime for varying numbers of processors at $n = 10^6$

and we sampled powers of 2 from 1 up to 32 for the numbers of processors. Since 1 node in the CoC-ICE cluster has 24 processors, up to 16 processors, the runtime decreased as the numbers of processors increased. The decreased rate is proportional to the increase rate of the number of processors up to 8 processors, i.e. when the number of processors become from 1 to 2, the runtime becomes halved, the same thing happened between 2 and 4 processors and 4 and 8 processors. But tendency doesn't persist for 8 processors to 16 processors (their runtime is 0.000129223 sec

and 0.000125647 sec respectively). This may be due to the increase of communication time, as opposed to the decrease of computation time, as the number of processors increases. However, at 32 processors, the runtime increased significantly, probably because 8 processors were located in a different node, and communications between processors in different nodes took much more time than those between processors in the same node.