

Assignment 1 - Sorting Small Integers with MPI

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Overview

The task here is to implement and analyze an efficient MPI program to sort small integers (keys) in distributed memory. For sorting Sampling sort has been used. Analysis of the algorithm is also provided by repeating the calculation for 3 different array sizes. The speedup for [2, 4, 8, 16] cores has been analysed. The reported data has been collected from JobID - **8130740**. The slurm.sh and 8130740.stdout files are included with the submission. For

Ascertaining performance

The performance on 3 different arrays sizes, across 4 cores has been analysed. For each measurement, the experiment was repeated 5 times.

After discarding the maximum and minimum value, an average of **runtime** across 3 readings is shown below. The **speedup** data is also calculated.

Analysis of the Data

- **Strong Scaling** - For the same problem size (n) as the number of processing(p) elements decreases the runtime decreases. Hence the algorithm is strongly scalable.
- **Weak Scaling** - The runtime is also preserved across n/p values. Also a strongly scalable algorithm is also weakly scalable.