Report – Assignment 2

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1. Introduction

Given a sequence of *n* integers, the task is to implement the Parallel Quicksort algorithm using C and MPI, and evaluate the performance.

The Parallel Quicksort algorithm is as below:

*1 Divide the data into p equal parts, one per process*

*2 Sort the data locally for each process*

*3 Perform global sort*

*3.1 Select pivot element within each process set*

*3.2 Locally in each process, divide the data into two sets according to the pivot (smaller or larger)*

*3.3 Split the processes into two groups and exchange data pairwise between*

*them so that all processes in one group get data less than the pivot and the others get data larger than the pivot.*

*3.4 Merge the two sets of numbers in each process into one sorted list*

*4 Repeat 3.1 - 3.4 recursively for each half until each group consists of one single process.*

There are three pivot strategies:

*1. Select the median in one processor in each group of processors.*

*2. Select the median of all medians in each processor group.*

*3. Select the mean value of all medians in each processor group.*

1. Implementation