Effect of Parallelization, Execution Time and Inter-process Communication on Sorting Techniques using Message Passing Interface

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Abstract

The aim of this paper is to show that the great part of the execution time is consumed in computations. So as the number of processors increase, the amount of work done by each processor will be decreased regardless of the effect of the number of physical cores used. Still the time taken to solve the computations dominates over the communication time as by increasing number of processors, tasks are more divided so overall time decreases. The total overhead generated from process initializations and inter-process communication negatively affects the execution time. Using MPI, parallelization on five sorting techniques which are selection sort, bubble sort, quick sort, insertion sort and shell sort have been implemented.

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Index Terms

Computer Science Communications

Keywords

MPI Parallel Programming Selection sort Bubble sort Quick sort Insertion Sort Shell Sort Bucket sort Sequential Programming.