Parallel Programming In C With MPI and OpenMP Solution Manual

The primary goal of parallel programming is to increase performance by using multiple processors. The key words are "increase performance" and "using multiple processors." Performance is a relative term that depends on the application, the hardware, and the software. In general, parallel programming is effective when the application can be partitioned into independent tasks that can be executed concurrently. The hardware provides the resources for parallel execution, and the software is responsible for coordinating the tasks and managing the communication between them.

A parallel program is a program that can run on a shared-memory multiprocessor system, where the processors share a common memory. The program is designed to take advantage of the parallelism inherent in the hardware by dividing the computation into smaller tasks that can be executed concurrently by different processors. The software provides the means for the processors to communicate with each other and to synchronize their activities, so that the overall program can proceed correctly even though some of its parts are running in parallel.

Parallel programming is often used to solve problems that are too large to fit into the memory of a single processor. In such cases, the program is designed to run on a number of processors connected by a interconnection network. The program is divided into smaller tasks that can be executed concurrently by different processors. The software is responsible for coordinating the tasks and managing the communication between them.

Parallel programming is a complex topic that involves many different components, including hardware, software, and algorithms. It requires a deep understanding of the underlying concepts and techniques, as well as a practical knowledge of how to apply them in real-world situations.

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