Programming Project 5

Experimental topic:

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Experimental report naming format:

StudentID-name-Project-X　(e.g., 2220183211-张三-Project-5)

FTP server address:

ftp://172.18.5.102/2020-2021-1/Operating-System-Concepts/Project5/

user name：liuchuan
pass word：liuchuan

Multithreaded Sorting Application

Write a multithreaded sorting program that works as follows: A list of integers is divided into two smaller lists of equal size. Two separate threads (which we will term sorting threads) sort each sublist using a sorting algorithm of your choice. The two sublists are then merged by a third thread—a merging thread—which merges the two sublists into a single sorted list.

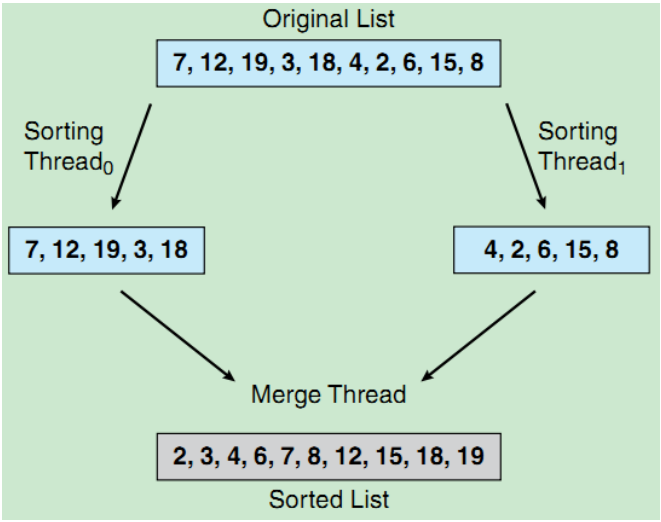

Figure 4.20 Multithreaded sorting.

Because global data are shared cross all threads, perhaps the easiest way to set up the data is to create a global array. Each sorting thread will work on one half of this array. A second global array of the same size as

the unsorted integer array will also be established. The merging thread will then merge the two sublists into this second array. Graphically, this program is structured according to Figure 4.20.

This programming project will require passing parameters to each of the sorting threads. In particular, it will be necessary to identify the starting index from which each thread is to begin sorting. Refer to the instructions in Project 1 for details on passing parameters to a thread.

The parent thread will output the sorted array once all sorting threads have exited.