Name:

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AIM: Using Divide and Conquer Strategies design a class for Concurrent Quick Sort using C++.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*PROGRAM\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#include <iostream>

#include <omp.h>

using namespace std;

int tid;

class quick

{

public:

int size,a[20];

int i;

void quickSort( int[], int, int);

int partition( int[], int, int);

void input()

{

cout<<"\n Enter size of the array ";

cin>>size;

cout<<"\n Enter elements: ";

for(i=0;i<size;i++)

{

cin>>a[i];

}

}

void print()

{

for(i = 0; i < size; ++i)

{

cout<<a[i]<<"\n";

}

}

};

int main()

{

quick q;

q.input();

cout<<"\nUnsorted array is: ";

q.print();

q.quickSort( q.a, 0, q.size-1);

cout<<"\n\nSorted array is: ";

q.print();

}

void quick::quickSort( int a[], int l, int r)

{

int j;

tid=omp\_get\_thread\_num();

cout<<" \n Thread number = "<<tid;

int p = omp\_get\_num\_threads();

cout<<" \n Total No of threads= " <<p;

if( l < r )

{

j = partition( a, l, r);

#pragma omp parallel sections

{

cout<<"\n Inside First Section ";

#pragma omp section

quickSort( a, l, j-1);

#pragma omp parallel sections

{

cout<<"\n Inside Second Section ";

#pragma omp section

quickSort( a, j+1, r);

}

}

}

int quick::partition( int a[], int l, int r)

{

int pivot, i, j, t,tid;

pivot = a[l];

i = l;

j = r+1;

while(1)

{

do ++i;

while(a[i]<= pivot && i<= r);

do --j;

while(a[j]>pivot);

if( i >= j )

break;

t = a[i];

a[i] = a[j];

a[j] = t;

}

t = a[l];

a[l] = a[j];

a[j] = t;

return j;

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OUTPUT\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

[root@localhost Admin]# g++ -fopenmp q1.cpp

[root@localhost Admin]# ./a.out

Enter size of the array 5

Enter elements: 89

55

77

17

25

Unsorted array is: 89

55

77

17

25

Thread number = 0

Total No of threads= 1

Inside First Section

Thread number = 1

Total No of threads= 2

Inside First Section

Thread number = 0

Total No of threads= 1

Inside Second Section

Thread number = 0

Total No of threads= 1

Inside First Section

Thread number = 0

Total No of threads= 1

Inside Second Section

Thread number = 0

Total No of threads= 1

Inside Second Section

Thread number = 0

Total No of threads= 2

Sorted array is: 17

25

55

77

89

[root@localhost Admin]#