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Practical no: 2 (B)

Title: Write a program to implement Parallel Merge Sort using OpenMP. Use existing algorithms and measure the performance of sequential and parallel algorithms.

```
#include<iostream>
#include<stdlib.h>
#include<omp.h>
using namespace std;


void mergesort(int a[],int i,int j);
void merge(int a[],int i1,int j1,int i2,int j2);

void mergesort(int a[],int i,int j)
{
   int mid;
   if(i<j)
   {
     mid=(i+j)/2;
     #pragma omp parallel sections
     {
        #pragma omp section
        {
          mergesort(a,i,mid);
        }
        #pragma omp section
        {
          mergesort(a,mid+1,j);
        }
     }
     merge(a,i,mid,mid+1,j);
   }
}

void merge(int a[],int i1,int j1,int i2,int j2)
{
  int temp[1000];
  int i,j,k;
  i=i1;
  j=i2;
  k=0;
```

```
 while(i<=j1 && j<=j2)
 {
  if(a[i]<a[j])
   {
    temp[k++]=a[i++];
   }
  else
   {
    temp[k++]=a[j++];
   }
 }
 while(i<=j1)
 {
  temp[k++]=a[i++];
 }
 while(j<=j2)
 {
  temp[k++]=a[j++];
 }
 for(i=i1,j=0;i<=j2;i++,j++)
 {
  a[i]=temp[j];
 }
}

int main()
{
   int *a,n,i;
   cout<<"\n enter total no of elements=>";
   cin>>n;
   a= new int[n];
   cout<<"\n enter elements=>\n";
   for(i=0;i<n;i++)
   {
     cin>>a[i];
   }
   mergesort(a, 0, n-1);
   cout<<"\n sorted array is=>";
   for(i=0;i<n;i++)
   {
    cout<<"\n"<<a[i];
   }
   return 0;
}
```

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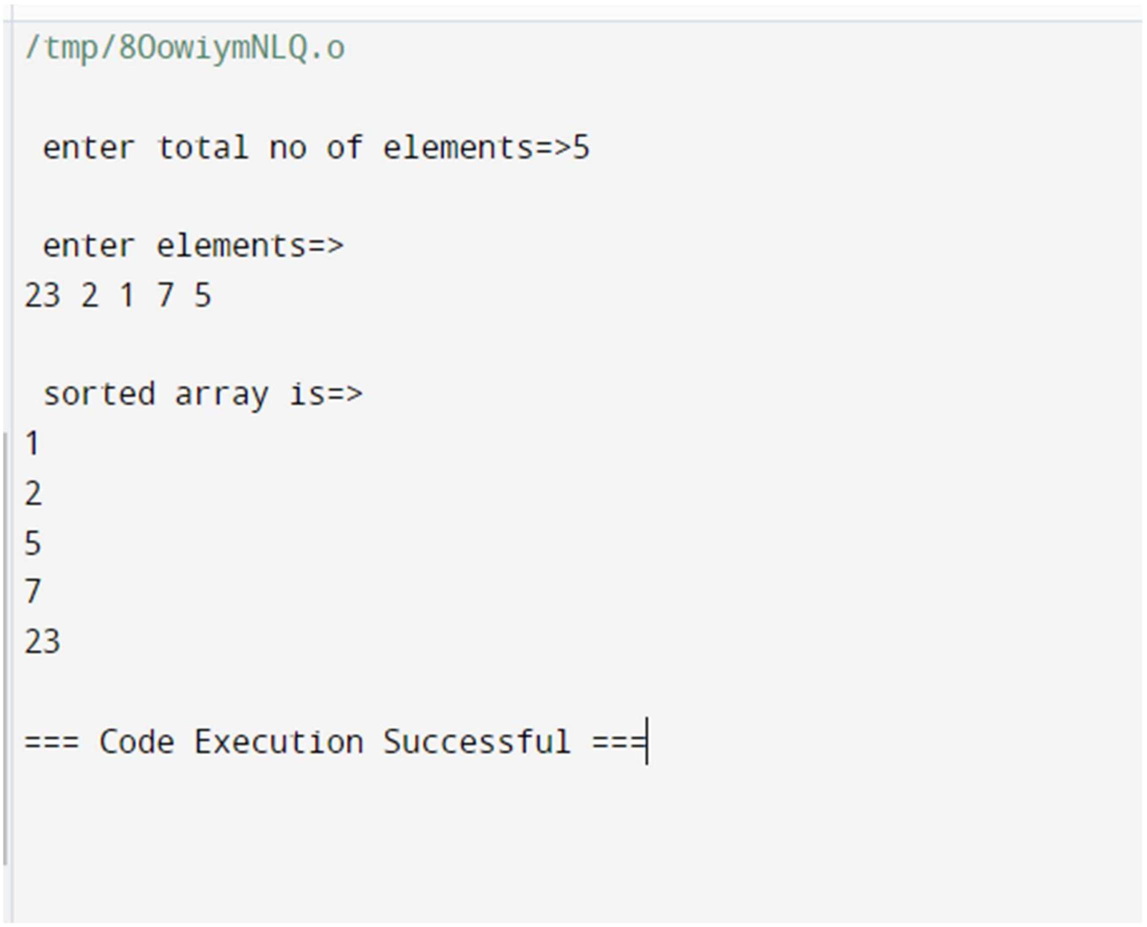
Output:



```
/tmp/8OowiymNLQ.o

 enter total no of elements=>5

 enter elements=>
23 2 1 7 5

 sorted array is=>
1
2
5
7
23

=== Code Execution Successful ===
```