#include<stdio.h>

#include<stdlib.h>

#include<time.h>

void merge(int arr[],int l,int m,int r)

{

int i,j,k;

int n1=m-l+1;

int n2=r-m;

int L[n1],R[n2];

for(i=0;i<n1;i++)

L[i]=arr[l+i];

for(j=0;j<n1;j++)

R[j]=arr[m+1+j];

i=0;

j=0;

k=l;

while(i<n1&&j<n2)

{

if(L[i]<=R[j])

{

arr[k]=L[i];

i++;

}

else

{

arr[k]=R[j];

j++;

}

k++;

}

while(i<n1)

{

arr[k]=R[j];

j++;

k++;

}

}

void mergeSort(int arr[],int l,int r)

{

if(l<r)

{

int m=l+(r-1)/2;

mergeSort(arr,l,m);

mergeSort(arr,m+1,r);

merge(arr,l,m,r);

}

}

void printArray(int A[],int size)

{

int i;

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

printf("%d",A[i]);

}

void main()

{

int arr[25];

int n;

printf("Enter the number of elements in the array\n");

scanf("%d",&n);

printf("Enter the elements of the array\n");

for(int i=0;i<n;i++)

printf("%d",&arr[i]);

clock\_t start=clock();

mergeSort(arr,0,n-1);

clock\_t end=clock();

printf("The sorted array is");

printArray(arr,n);

printf("\nThe start time is %lf",(double)start);

printf("\nThe end time is %lf",(double)end);

printf("\nThe total time is %lf",(double)(end-start));

}