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1BM19CS224

Sort a given set of N integer elements using Merge Sort technique and compute its time taken. Run the program for different values of N and record the time taken to sort.

#include<stdio.h>

#include<stdlib.h>

#include<time.h>

void merge(int a[],int low,int mid,int high)

{

int i,k,l,m,temp[1000];

l=low;

i=low;

m=mid+1;

while((l<=mid)&&(m<=high)){

if(a[l]<=a[m]){

temp[i]=a[l];

l++;

}

else{

temp[i]=a[m];

m++;

}

i++;

}

if(l>mid)

{

for(k=m;k<=high;k++)

{

temp[i]=a[k];

i++;

}

}

else

{

for(k=l;k<=mid;k++)

{

temp[i]=a[k];

i++;

}

}

for(k=low;k<=high;k++)

{

a[k]=temp[k];

}

}

void mergesort(int a[],int low,int high)

{

int mid;

if(low<high){

mid=(low+high)/2;

mergesort(a,low,mid);

mergesort(a,mid+1,high);

merge(a,low,mid,high);

}

}

void main()

{

int a[1000],i,n;

clock\_t start,end;

double time;

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

scanf("%d",&n);

printf("The elements are:\n");

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

a[i]=(int)rand()%10000;

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

}

start=clock();

mergesort(a,0,n-1);

end=clock();

time=((double)(end-start))/CLOCKS\_PER\_SEC;

printf("\nSorted elements:\n");

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

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

}

printf("\nTime taken=%1f\n",time);

}

