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**Roll No.:- 28**

**Assignment No.:-4.4**

**Title:-Implementation of program based on Merge Sort Technique**

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#include<iostream.h>

#include<conio.h>

#include<stdlib.h>

class LIST

{

int \*A,n;

public:

LIST(int);

void READ\_LIST\_028();

void SHOW\_LIST\_028();

void MERGE\_SORT\_ASC\_028(int,int);

void MERGE\_SORT\_DESC\_028(int,int);

void MERGE\_ASC\_028(int,int,int);

void MERGE\_DESC\_028(int,int,int);

};

LIST::LIST(int par)

{

n=par;

A=new int[n+1];

};

void LIST::READ\_LIST\_028()

{

cout<<endl<<"Enter elements";

for(int i=1;i<=n;i++)

//cin>>A[i];

A[i]=random(999);

}

void LIST::SHOW\_LIST\_028()

{

cout<<endl;

for(int i=1;i<=n;i++)

cout<<A[i]<<" ";

}

void LIST::MERGE\_SORT\_ASC\_028(int low,int high)

{

if(low<high)

{

int mid=(low+high)/2;

MERGE\_SORT\_ASC\_028(low,mid);

MERGE\_SORT\_ASC\_028(mid+1,high);

MERGE\_ASC\_028(low,mid,high);

}

}

void LIST::MERGE\_SORT\_DESC\_028(int low,int high)

{

if(low<high)

{

int mid=(low+high)/2;

MERGE\_SORT\_DESC\_028(low,mid);

MERGE\_SORT\_DESC\_028(mid+1,high);

MERGE\_DESC\_028(low,mid,high);

}

}

void LIST::MERGE\_ASC\_028(int low,int mid,int high)

{

int \*B=new int[n+1];

int h=low,i=low,j=mid+1;

while(h<=mid && j<=high)

{

if(A[h] < A[j])

{

B[i]=A[h];

h=h+1;

}

else

{

B[i]=A[j];

j=j+1;

}

i=i+1;

}

if(h>mid)

{

while(j<=high)

{

B[i]=A[j];

j=j+1;

i=i+1;

}

}

else

{

while(h<=mid)

{

B[i]=A[h];

h=h+1;

i=i+1;

}

}

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

A[i]=B[i];

}

void LIST::MERGE\_DESC\_028(int low,int mid,int high)

{

int \*B=new int[n+1];

int h=low,i=low,j=mid+1;

while(h<=mid && j<=high)

{

if(A[h] > A[j])

{

B[i]=A[h];

h=h+1;

}

else

{

B[i]=A[j];

j=j+1;

}

i=i+1;

}

if(h>mid)

{

while(j<=high)

{

B[i]=A[j];

j=j+1;

i=i+1;

}

}

else

{

while(h<=mid)

{

B[i]=A[h];

h=h+1;

i=i+1;

}

}

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

A[i]=B[i];

}

void main()

{

int no;

clrscr();

cout<<endl<<"\n Enter no of element : ";

cin>>no;

LIST obj(no);

obj.READ\_LIST\_028();

cout<<endl<<"list before Sorting : ";

obj.SHOW\_LIST\_028();

obj.MERGE\_SORT\_ASC\_028(1,no);

//obj.MERGE\_SORT\_DESC\_028(1,no);

cout<<endl<<"List after Sorting : ";

obj.SHOW\_LIST\_028();

getch();

}