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**END TERM PRACTICAL EVALUATION**

**Objective:** Write an algorithm and program to sort n numbers using Merge sort technique.

**i)** Using normal approach i.e. recursion illustrating Divide and Conquer.

**Source Code:**

#include <stdio.h>

#include<conio.h>

#include<stdlib.h>

#define max 15

int a[11], b[10];

void merging(int low, int mid, int high) {

int l1, l2, i;

for(l1 = low, l2 = mid + 1, i = low; l1 <= mid && l2 <= high; i++) {

if(a[l1] <= a[l2])

b[i] = a[l1++];

else

b[i] = a[l2++];

}

while(l1 <= mid)

b[i++] = a[l1++];

while(l2 <= high)

b[i++] = a[l2++];

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

a[i] = b[i];

}

void sort(int low, int high) {

int mid;

if(low < high) {

mid = (low + high) / 2;

sort(low, mid);

sort(mid+1, high);

merging(low, mid, high);

} else {

return;

}

}

void main() {

int i,s;

clrscr();

printf("\nEnter size of array:");

scanf("%d", &s);

printf("Enter the elements:");

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

{

scanf("%d",&a[i]);

}

printf("Before sorting\n");

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

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

sort(0, s-1);

printf("\nAfter sorting\n");

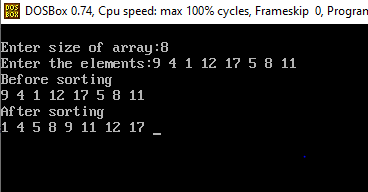
for(i = 0; i < s; i++)

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

getch();

}

**Output:**



**ii)** Without using recursion

**Source Code:**

#include <stdio.h>

#include<conio.h>

#define MAX 30

void main()

{

int arr[MAX],temp[MAX],i,j,k,n,size,l1,h1,l2,h2;

clrscr();

printf("Enter the number of elements : ");

scanf("%d",&n);

printf("\nEnter elements:");

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

{

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

}

for(size=1; size < n; size=size\*2 )

{

l1=0;

k=0;

while( l1+size < n)

{

h1=l1+size-1;

l2=h1+1;

h2=l2+size-1;

if( h2>=n )

h2=n-1;

i=l1;

j=l2;

while(i<=h1 && j<=h2 )

{

if( arr[i] <= arr[j] )

temp[k++]=arr[i++];

else

temp[k++]=arr[j++];

}

while(i<=h1)

temp[k++]=arr[i++];

while(j<=h2)

temp[k++]=arr[j++];

l1=h2+1;

}

for(i=l1; k<n; i++)

temp[k++]=arr[i];

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

arr[i]=temp[i];

}

printf("Sorted list is :\n");

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

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

printf("\n");

getch();

}

**Output:**

