**ASSIGNMENT-3**

3.5. Write a C program to sort an array of N elements using the Merge sort algorithm.

**CODE-**

#include<stdio.h>

void merge(int a[], int l, int mid, int h)

{

int i,j,k;

int size\_1=mid-l+1;

int size\_2=h-mid;

int L[size\_1], R[size\_2];

for(i=0;i<size\_1;i++)

{

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

}

for(j=0;j<size\_2;j++)

{

R[j]=a[mid+1+j];

}

i=0;

j=0;

k=l;

while(i<size\_1 && j<size\_2)

{

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

{

a[k]=L[i];

i++;

}

else

{

a[k]=R[j];

j++;

}

k++;

}

while(i<size\_1)

{

a[k]=L[i];

i++;

k++;

}

while(j<size\_2)

{

a[k]=R[j];

j++;

k++;

}

}

void merge\_sort(int a[], int l, int h)

{

if(l<h)

{

int mid=(l+h)/2;

merge\_sort(a,l,mid);

merge\_sort(a,mid+1,h);

merge(a,l,mid,h);

}

}

int main()

{

int a[10],size,i;

printf("Enter the size of array-");

scanf("%d",&size);

if(size>10)

{

printf("Array overflows");

}

else

{

printf("The the size of array-%d",size);

printf("\nEnter the elements of the array-");

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

{

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

}

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

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

{

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

}

merge\_sort(a,0,size-1);

printf("\nSorted array\n");

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

{

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

}

}

return 0;

}