**AIM:** Program to demonstrate the use of merge sort in an array.

**Algorithm:**

1.START

2.CREATE FUNCTION (merge sort( ))

If(1<r)

{

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

mergeSort(arr, 1, m);

mergeSort(arr,m+1,r);

merge (arr,1,m,r);

}

3.FUNCTION FOR MERGING ARRAY(merge( ))

4.FUNCTION TO PRINT ARRAY

5.TAKE INPUT FOT SIZE

6. INPUT THE ELEMENTS OF ARRAY

7.CALLmergeSort()

8.END.

**SOURCE CODE:**

#include<iostream>

using namespace std;

void merge(int arr[], int start, int middle, int end)

{

int i, j, k;

int n1 = middle - start + 1;

int n2 = end - middle;

int L[30], R[30];

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

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

for (j = 0; j < n2; j++)

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

i = 0;

j = 0;

k = start;

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] = L[i];

i++;

k++;

}

while (j < n2)

{

arr[k] = R[j];

j++;

k++;

}

}

void mergeSort(int arr[], int start, int end)

{

if (start < end)

{

int middle =start+(end-start)/2;

mergeSort(arr, start, middle);

mergeSort(arr, middle+1, end);

merge(arr, start, middle, end);

}

}

int main()

{

int array[50],n;

cout<<"Vaibhav Kaushal"<<endl;

cout<<"17BCS1728"<<endl;

cout<<"Enter the number of elements: "; cin>>n;

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

{

cin>>array[i];

}

mergeSort(array, 0, n-1);

cout<<"\n Array after sorting : ";

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

cout<<array[i]<<" ";

}

**OUTPUT:**

