S.No: 6	Exp. Name: ***Sort a list using Merge Sort Technique.***	Date:2023-09-24

Aim:

Write a java program to sort the given list of elements using **Merge Sort**.

Source Code:

q36416/MergeSort.java

```
package q36416;
import java.io.*;
import java.util.Scanner;
class MergeSort
{
   public static void main(String args[])
   {
      int n;
      System.out.print("Enter no of elements: ");
      Scanner s=new Scanner(System.in);
      n=s.nextInt();
      int a[]=new int [n];
      System.out.println("Enter the elements:");
      for(int i=0;i<n;i++)
      {
         a[i]=s.nextInt();
      }
      MergeSort x= new MergeSort();
      MergeSort.mergesort(a,0,n-1);
      System.out.println("Sorted array: ");
      for(int i=0;i<n;i++)
      {
         System.out.print(a[i]+" ");
      }
   }
   static void mergesort(int a[],int low,int high)
   {
      if(low<high)
      {
         int mid = (low+high)/2;
         MergeSort.mergesort(a,low,mid);
         MergeSort.mergesort(a,mid+1,high);
         MergeSort.merge(a,low,mid,high);
      }
   }
   static void merge(int a[],int low,int mid,int high)
   {
      int i=low,temp,j=mid+1,k=low;
      int b[]=new int[20];
      while(i<=mid && j<=high)
      {
         if(a[i] < a[j])
         {
            b[k]=a[i];
            i++;
         }
```

```
         else
         {
            b[k]=a[j];
            j++;
         }
         k++;
      }
      if(i>mid)
      {
         while(j<=high)
         {
            b[k]=a[j];
            k++;
            j++;
         }
      }
      else
      {
         while(i<=mid)
         {
            b[k]=a[i];
            i++;
            k++;
         }
      }
      i=0;
      for(i=low;i<=high;i++)
      {
         a[i]=b[i];
      }
   }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter no of elements: 3
Enter the elements: 100 50 75
Sorted array:
50 75 100

Test Case - 2
User Output
Enter no of elements: 4
Enter the elements: 1 3 5 2
Sorted array:
1 2 3 5