2022-2026-CSE-AIML

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++)</pre>
         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++)</pre>
         System.out.print(a[i]+" ");
      }
   static void mergesort(int a[],int low,int high)
   {
      if(low<high)</pre>
         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)</pre>
         if(a[i] < a[j])
            b[k]=a[i];
            i++;
```

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