

Aim:

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

Source Code:**q36416/MergeSort.java**

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

```

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