**package** sort;

**import** java.util.Scanner;

**class** MergeSort {

**void** merge(**int** a[], **int** beg, **int** mid, **int** end)

{

**int** i, j, k;

**int** n1 = mid - beg + 1;

**int** n2 = end - mid;

**int** LeftArray[] = **new** **int**[n1];

**int** RightArray[] = **new** **int**[n2];

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

LeftArray[i] = a[beg + i];

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

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

i = 0;

j = 0;

k = beg;

**while** (i < n1 && j < n2)

{

**if**(LeftArray[i] <= RightArray[j])

{

a[k] = LeftArray[i];

i++;

}

**else**

{

a[k] = RightArray[j];

j++;

}

k++;

}

**while** (i<n1)

{

a[k] = LeftArray[i];

i++;

k++;

}

**while** (j<n2)

{

a[k] = RightArray[j];

j++;

k++;

}

}

**void** mergeSort(**int** a[], **int** beg, **int** end)

{

**if** (beg < end)

{

**int** mid = (beg + end) / 2;

mergeSort(a, beg, mid);

mergeSort(a, mid + 1, end);

merge(a, beg, mid, end);

}

}

**void** printArray(**int** a[], **int** n)

{

**int** i;

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

System.***out***.print(a[i] + " ");

}

**public** **static** **void** main(String args[])

{

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("enter size of array");

**int** n=sc.nextInt();

**int** a[]=**new** **int**[n];

System.***out***.println("Enter elements in array");

**for**(**int** i=0;i<a.length;i++) {

a[i]=sc.nextInt();

}

MergeSort m1 = **new** MergeSort();

System.***out***.println("\nBefore sorting array elements are - ");

m1.printArray(a, n);

m1.mergeSort(a, 0, n - 1);

System.***out***.println("\nAfter merge sorting array elements are - ");

m1.printArray(a, n);

System.***out***.println("");

}

}