public class MergeSort {

public static void main(String[] args) {

int[] arr = {5, 2, 8, 3, 1, 6, 9, 4, 7};

System.out.println("Original array: " + Arrays.toString(arr));

mergeSort(arr, 0, arr.length - 1);

System.out.println("Sorted array: " + Arrays.toString(arr));

}

public static void mergeSort(int[] arr, int left, int right) {

if (left < right) {

int mid = (left + right) / 2;

mergeSort(arr, left, mid);

mergeSort(arr, mid + 1, right);

merge(arr, left, mid, right);

}

}

public static void merge(int[] arr, int left, int mid, int right) {

int n1 = mid - left + 1;

int n2 = right - mid;

int[] leftArr = new int[n1];

int[] rightArr = new int[n2];

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

leftArr[i] = arr[left + i];

}

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

rightArr[j] = arr[mid + 1 + j];

}

int i = 0, j = 0, k = left;

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

if (leftArr[i] <= rightArr[j]) {

arr[k] = leftArr[i];

i++;

} else {

arr[k] = rightArr[j];

j++;

}

k++;

}

while (i < n1) {

arr[k] = leftArr[i];

i++;

k++;

}

while (j < n2) {

arr[k] = rightArr[j];

j++;

k++;

}

}

}