import java.util.Scanner;

public class QuickSort {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.print("Enter the number of elements: ");

int n ;

n = sc.nextInt();

int[] arr = new int[n];

System.out.println("Enter the elements:");

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

arr[i] = sc.nextInt();

}

System.out.println("Original Array:");

printArray(arr);

quickSort(arr, 0, n - 1);

System.out.println("Sorted Array:");

printArray(arr);

sc.close();

}

public static void quickSort(int[] arr, int low, int high) {

if (low < high) {

int pivotIndex = partition(arr, low, high);

quickSort(arr, low, pivotIndex - 1);

quickSort(arr, pivotIndex + 1, high);

}

}

public static int partition(int[] arr, int low, int high) {

int pivot = arr[high];

int i = low - 1;

for (int j = low; j < high; j++) {

if (arr[j] < pivot) {

i++;

swap(arr, i, j);

}

}

swap(arr, i + 1, high);

return i + 1;

}

public static void swap(int[] arr, int i, int j) {

int temp = arr[i];

arr[i] = arr[j];

arr[j] = temp;

}

public static void printArray(int[] arr) {

for (int num : arr) {

System.out.print(num + " ");

}

System.out.println();

}

}