import java.io.\*;

import java.util.\*;

class Main

{

public static void main(String args[])throws IOException

{

InputStreamReader isr = new InputStreamReader(System.in);

BufferedReader br = new BufferedReader(isr);

Random r = new Random();

int i,j,k,n;

System.out.println("Enter no. of elements");

n=Integer.parseInt(br.readLine());

int a[]= new int[n+1];

int aorig[] = new int[n+1];

for(k=0;k<n;k++)

{

a[k] = r.nextInt(100);

}

for(k=0;k<n;k++)

{

aorig[k] = a[k];

}

System.out.println("Unsorted array");

for(k=0;k<n;k++)

{

System.out.print(aorig[k] + " ");

}

quickSort(a,0,n-1);

System.out.println("Sorted array");

for(k=0;k<n;k++)

{

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

}

}

public static int partition(int a[],int l,int h)

{

int i=l;

int j=h;

int pivot = a[l];

int temp,temp2;

while(i<j)

{

while(a[i]<pivot)

{

i++;

}

while(a[j]>pivot)

{

j--;

}

if(i<j)

{

temp = a[i];

a[i] = a[j];

a[j] = temp;

}

}

temp2 = pivot;

pivot = a[j];

a[j] = pivot;

return j;

}

public static void quickSort(int a[],int l,int h)

{

if(l<h)

{

int j = partition(a,l,h);

quickSort(a,l,j-1);

quickSort(a,j+1,h);

}

}

}