// bubble sort

#include<iostream>

using namespace std;

void Input(int arr[], int Size) {

cout << "Enter an Unsorted array of elements -->\n" << endl;

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

cout << "Enter element " << i + 1 << " : ";

cin >> arr[i];

}

}

void Output(int arr[], int Size) {

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

cout << "Element " << i + 1 << " : " << arr[i] << endl;

}

}

// arr[] same as \*arr as pointer to first element

// so always changes saved in main

void BubbleSort(int arr[], int Size) {

// number of passes, doesnt compare with itself so till Size - 1

for (int i = 0; i < Size - 1; i++) {

// makes the algorithm adaptive

int flag = 0;

// number of swaps

// reduces by 1 in each pass as elements get sorted

for (int j = 0; j < Size - 1 - i; j++) {

// swap arr[j] and arr[j+1] if arr[j] > arr[j+1]

if (arr[j] > arr[j + 1]) {

int temp = arr[j];

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

arr[j + 1] = temp;

flag = 1; // shows swap done atleast once

}

}

// if no swap done in a pass, means sorted, so break out of the loop and into main

if (flag == 0) break;

}

}

int main() {

int arr[100];

int size = 0;

cout << "Enter size of array (max size = 100): ";

cin >> size;

if (size < 0 || size > 100) return 0;

Input(arr, size);

cout << "\nUnsorted array -->" << endl;

Output(arr, size);

cout << "\nSorted array -->" << endl;

BubbleSort(arr, size);

Output(arr, size);

return 0;

}