#include<iostream>

using namespace std;

/////////////// support functions ///////////////

void fill(int\* arr, int n) {

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

arr[i] = rand() % 10;

}

}

void show(int\* arr, int n) {

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

cout << arr[i] << " ";

}

cout << endl;

}

/////////////// algorithm of shell sort ///////////////

void shellSort(int\* arr, int n) {

for (int step = n / 2; step > 0; step /= 2) {

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

for (int j = i + step; j < n; j += step) {

if (arr[i] > arr[j]) {

int temp = arr[j];

arr[j] = arr[i];

arr[i] = temp;

}

}

}

}

}

/////////////// test function ///////////////

void testSort() {

int n = rand() % 100;

int\* arr = new int[n];

bool cheker = true;

fill(arr, n);

show(arr, n);

shellSort(arr, n);

show(arr, n);

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

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

cheker = false;

break;

}

}

cheker ? cout << "test passed" << endl << endl

: cout << "test failed" << endl << endl;

}

/////////////// main function ///////////////

void main() {

testSort();

testSort();

testSort();

}