#include <iostream>

#include <iomanip>

#include <vector>

using namespace std;

void insertionSort(vector<float>& arr) {

int n = arr.size();

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

float key = arr[i];

int j = i - 1;

while (j >= 0 && key < arr[j]) {

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

--j;

}

arr[j + 1] = key;

}

}

void shellSort(vector<float>& arr) {

int n = arr.size();

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

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

float temp = arr[i];

int j = i;

while (j >= gap && arr[j - gap] > temp) {

arr[j] = arr[j - gap];

j -= gap;

}

arr[j] = temp;

}

}

}

void displayTopScores(const vector<float>& arr, int topN = 5) {

cout << "Top " << topN << " scores:" << endl;

for (int i = arr.size() - 1; i >= max(0, int(arr.size()) - topN); --i) {

cout << fixed << setprecision(2) << arr[i] << "%" << endl;

}

}

int main() {

// Input: Second year percentage of students

vector<float> percentages = {89.5, 76.2, 95.7, 82.3, 90.1, 78.8, 88.0, 92.5, 85.4, 79.6};

// Sorting using Insertion Sort

vector<float> insertionSortPercentages = percentages;

insertionSort(insertionSortPercentages);

// Sorting using Shell Sort

vector<float> shellSortPercentages = percentages;

shellSort(shellSortPercentages);

// Display top five scores

cout << "Original Percentages:" << endl;

for (float percentage : percentages) {

cout << fixed << setprecision(2) << percentage << "%" << endl;

}

cout << "\nSorted Percentages using Insertion Sort:" << endl;

displayTopScores(insertionSortPercentages);

cout << "\nSorted Percentages using Shell Sort:" << endl;

displayTopScores(shellSortPercentages);

return 0;

}