#include <iostream>

#include <cstdlib>

using namespace std;

const int MAX = 10;

int Data[MAX];

// Prosedur menukar data

void Tukar(int\* a, int\* b) {

int temp = \*a;

\*a = \*b;

\*b = temp;

}

// Prosedur pengurutan metode gelembung

void BubbleSort(int& comparisons, int& swaps) {

int i, j;

comparisons = 0;

swaps = 0;

for (i = 1; i < MAX - 1; i++) {

for (j = MAX - 1; j >= i; j--) {

comparisons++;

if (Data[j - 1] > Data[j]) {

Tukar(&Data[j - 1], &Data[j]);

swaps++;

}

}

}

}

// Prosedur pengurutan metode Shell

void ShellSort(int& comparisons, int& swaps) {

int Jarak, i, j;

bool Sudah;

Jarak = MAX;

comparisons = 0;

swaps = 0;

while (Jarak > 1) {

Jarak = Jarak / 2;

Sudah = false;

while (!Sudah) {

Sudah = true;

for (j = 0; j < MAX - Jarak; j++) {

i = j + Jarak;

comparisons++;

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

Tukar(&Data[j], &Data[i]);

Sudah = false;

swaps++;

}

}

}

}

}

int main() {

int i, pilihan, comparisons, swaps;

srand(0);

// Membangkitkan bilangan acak

cout << "DATA SEBELUM TERURUT" << endl;

for (i = 0; i < MAX; i++) {

Data[i] = rand() / 1000 + 1;

cout << "Data ke " << i << " : " << Data[i] << endl;

}

// Menu pilihan metode pengurutan

cout << "\nPilih metode pengurutan:" << endl;

cout << "1. Bubble Sort" << endl;

cout << "2. Shell Sort" << endl;

cout << "Pilihan Anda: ";

cin >> pilihan;

switch (pilihan) {

case 1:

cout << "\nProses Bubble Sort:" << endl;

BubbleSort(comparisons, swaps);

cout << "\nData setelah diurutkan dengan Bubble Sort:" << endl;

cout << "Jumlah Perbandingan: " << comparisons << endl;

cout << "Jumlah Pergeseran: " << swaps << endl;

break;

case 2:

cout << "\nProses Shell Sort:" << endl;

ShellSort(comparisons, swaps);

cout << "\nData setelah diurutkan dengan Shell Sort:" << endl;

cout << "Jumlah Perbandingan: " << comparisons << endl;

cout << "Jumlah Pergeseran: " << swaps << endl;

break;

default:

cout << "Pilihan tidak valid!" << endl;

return 0;

}

// Menampilkan data setelah diurutkan

for (i = 0; i < MAX; i++) {

cout << "Data ke " << i << " : " << Data[i] << endl;

}

return 0;

}