#include <iostream>

using namespace std;

void displayGrades(int grades[], int size, int index = 0) {

if (index == size) {

cout << endl;

return;

}

cout << grades[index] << " ";

displayGrades(grades, size, index + 1);

}

int sumGrades(int grades[], int size, int index = 0) {

if (index == size) return 0;

return grades[index] + sumGrades(grades, size, index + 1);

}

int countFailing(int grades[], int size, int index = 0) {

if (index == size) return 0;

int fail = (grades[index] < 60) ? 1 : 0;

return fail + countFailing(grades, size, index + 1);

}

int findMax(int grades[], int size, int index = 0, int currentMax = -1) {

if (index == size) return currentMax;

if (grades[index] > currentMax) currentMax = grades[index];

return findMax(grades, size, index + 1, currentMax);

}

int main() {

const int MAX\_SIZE = 100;

int grades[MAX\_SIZE];

int size = 0;

int choice;

cout << "\*\*\*\*\*\*\*\* Welcome to Recursive Grade Analyzer \*\*\*\*\*\*\*\*" << endl;

do {

cout << "\nPlease choose one of the following operations:\n";

cout << "1. Enter Grades\n";

cout << "2. Display Grades\n";

cout << "3. Calculate Average Grade (using Recursion)\n";

cout << "4. Count Failing Grades (using Recursion)\n";

cout << "5. Find Highest Grade (using Recursion)\n";

cout << "6. Exit\n";

cout << "Choice: ";

cin >> choice;

switch (choice) {

case 1: {

cout << "How many grades do you want to enter? ";

cin >> size;

if (size > MAX\_SIZE) {

cout << "Too many grades! Max is " << MAX\_SIZE << endl;

size = 0;

break;

}

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

cout << "Enter grade #" << (i + 1) << ": ";

cin >> grades[i];

}

cout << "Grades successfully saved!" << endl;

break;

}

case 2:

if (size == 0) {

cout << "No grades entered yet." << endl;

}

else {

cout << "Grades entered:\n→ ";

displayGrades(grades, size);

}

break;

case 3:

if (size == 0) {

cout << "No grades available to calculate average." << endl;

}

else {

double avg = (double)sumGrades(grades, size) / size;

cout << "The average grade is: " << avg << endl;

}

break;

case 4:

if (size == 0) {

cout << "No grades available to count." << endl;

}

else {

cout << "Number of failing grades: "

<< countFailing(grades, size) << endl;

}

break;

case 5:

if (size == 0) {

cout << "No grades available to analyze." << endl;

}

else {

cout << "Highest grade: " << findMax(grades, size) << endl;

}

break;

case 6:

cout << "Thank you for using Recursive Grade Analyzer!" << endl;

break;

default:

cout << "Invalid choice, please try again." << endl;

}

} while (choice != 6);

return 0;

}