#include <iostream>

#include <vector>

using namespace std;

// Function to input a matrix

vector<vector<int>> inputMatrix(int rows, int cols) {

vector<vector<int>> matrix;

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

matrix.push\_back(vector<int>());

for (int j = 0; j < cols; j++) {

int elem;

cin >> elem;

matrix[i].push\_back(elem);

}

}

return matrix;

}

// Function to print a matrix

void printMatrix(vector<vector<int>>& matrix) {

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

for (int j = 0; j < matrix[i].size(); j++) {

cout << matrix[i][j] << " ";

}

cout << endl;

}

}

int main() {

int choice;

cout << "The Matrix Calculator" << endl;

cout << "-----------------" << endl;

cout << "1. Add matrices" << endl;

cout << "2. Process on matrices" << endl;

cout << "3. Multiplying matrices" << endl;

cout << "choose btween (1-3): ";

cin >> choice;

vector<vector<int>> matrix1, matrix2, result;

int rows1, cols1, rows2, cols2;

switch (choice) {

case 1:

case 2:

// Input the dimensions of the matrices

cout << "Enter the number of rows and columns in the first matrix: ";

cin >> rows1 >> cols1;

cout << "Enter the elements of the first matrix:" << endl;

matrix1 = inputMatrix(rows1, cols1);

cout << "Enter the elements of the second matrix: ";

cin >> rows2 >> cols2;

// Check if the matrices can be added or subtracted

if (rows1 != rows2 || cols1 != cols2) {

cout << "Matrices cannot be added or subtracted. Exiting program." << endl;

return 0;

}

cout << "Enter the elements of the second matrix:" << endl;

matrix2 = inputMatrix(rows2, cols2);

// Perform the operation

if (choice == 1) {

result = matrix1;

for (int i = 0; i < rows1; i++) {

for (int j = 0; j < cols1; j++) {

result[i][j] += matrix2[i][j];

}

}

} else {

result = matrix1;

for (int i = 0; i < rows1; i++) {

for (int j = 0; j < cols1; j++) {

result[i][j] -= matrix2[i][j];

}

}

}

// Print the result

cout << "Result:" << endl;

printMatrix(result);

break;

case 3:

// Input the dimensions of the matrices

cout << "Enter the number of rows and columns in the first matrix: ";

cin >> rows1 >> cols1;

cout << "Enter the elements of the first matrix:" << endl;

matrix1 = inputMatrix(rows1, cols1);

cout << "Enter the number of rows and columns in the second matrix: ";

cin >> rows2 >> cols2;

// Check if the matrices can be multiplied

if (cols1 != rows2) {

cout << "Matrices cannot be multiplied. Exiting program." << endl;

return 0;

}

cout << "Enter the elements of the second matrix:" << endl;

matrix2 = inputMatrix(rows2, cols2);

// Perform the operation

result = vector<vector<int>>(rows1, vector<int>(cols2, 0));

for (int i = 0; i < rows1; i++) {

for (int j = 0; j < cols2; j++) {

for (int k = 0; k < cols1; k++) {

result[i][j] += matrix1[i][k] \* matrix2[k][j];

}

}

}

// Print the result

cout << "Result:" << endl;

printMatrix(result);

break;

default:

cout << "Invalid choice. Exiting program." << endl;

break;

}

return 0;

}