#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 << "Matrix Calculator" << endl;

Cout << "-----------------" << endl;

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

Cout << "2. Subtract matrices" << endl;

Cout << "3. Multiply matrices" << endl;

Cout << "Enter your choice (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 number of rows and columns in 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;

}