#include<iostream>

using namespace std;

class Matrix {

public:

int n1, n2, n3, n4;

int a[12][12], b[12][12], c[12][12];

void read();

void show();

void add();

void sub();

void mul();

};

void Matrix::read() {

cout << "-enter elements of matrix A-" << endl;

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

cout << "element a[" << i + 1 << "][" << j + 1 << "]: ";

cin >> a[i][j];

}

}

cout << "-enter elements of matrix B-" << endl;

for(int i = 0; i < n3; i++) {

for(int j = 0; j < n4; j++) {

cout << "element b[" << i + 1 << "][" << j + 1 << "]: ";

cin >> b[i][j];

}

}

}

void Matrix::show() {

cout << "---matrix A elements are---" << endl;

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

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

}

cout << endl;

}

cout << "---matrix B elements are---" << endl;

for(int i = 0; i < n3; i++) {

for(int j = 0; j < n4; j++) {

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

}

cout << endl;

}

}

void Matrix::add() {

if(n1 != n3 || n2 != n4) {

cout << "Addition cannot be performed. Matrices have different dimensions." << endl;

return;

}

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

c[i][j] = a[i][j] + b[i][j];

}

}

cout << "---addition of matrix A and matrix B---" << endl;

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

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

}

cout << endl;

}

}

void Matrix::sub() {

if(n1 != n3 || n2 != n4) {

cout << "Subtraction cannot be performed. Matrices have different dimensions." << endl;

return;

}

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

c[i][j] = a[i][j] - b[i][j];

}

}

cout << "---subtraction of matrix A and matrix B---" << endl;

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n2; j++) {

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

}

cout << endl;

}

}

void Matrix::mul() {

if(n2 != n3) {

cout << "Multiplication cannot be performed. Number of columns in matrix A is not equal to number of rows in matrix B." << endl;

return;

}

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n4; j++) {

c[i][j] = 0;

for(int k = 0; k < n2; k++) {

c[i][j] += a[i][k] \* b[k][j];

}

}

}

cout << "---multiplication of matrix A and matrix B---" << endl;

for(int i = 0; i < n1; i++) {

for(int j = 0; j < n4; j++) {

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

}

cout << endl;

}

}

int main() {

Matrix aa;

cout << "Enter rows and columns of matrix A: ";

cin >> aa.n1 >> aa.n2;

cout << "Enter rows and columns of matrix B: ";

cin >> aa.n3 >> aa.n4;

aa.read();

aa.show();

aa.add();

aa.sub();

aa.mul();

return 0;

}