/\* Nathan Bemus----- Data Structures and Algorithms 2 ----- 2/1/17 ----- MatrixMultiplication.cpp\*/

#include <iostream>

using namespace std;

int main()

{

int a[10][10], b[10][10], multiply[10][10], row1, col1, row2, col2, i, j, k;

//Input the matrix size within limit

cout << "Enter rows for first matrix (Max Rows = 10): ";

cin >> row1;

cout << "Enter columns for first matrix ((Max Columns = 10): ";

cin >> col1;

cout << "Enter rows for second matrix (Max Rows = 10): ";

cin >> row2;

cout << "Enter columns for first matrix ((Max Columns = 10): ";

cin >> col2;

// If column of first matrix in not equal to row of second matrix,

// ask the user to enter the size of matrix again.

while (col1 != row2)

{

cout << "Error:: column of first matrix not equal to row of second matrix." << endl << endl;

cout << "Enter rows for first matrix (Max Rows = 10): ";

cin >> row1;

cout << "Enter columns for first matrix ((Max Columns = 10): ";

cin >> col1;

cout << "Enter rows for second matrix (Max Rows = 10): ";

cin >> row2;

cout << "Enter columns for first matrix ((Max Columns = 10): ";

cin >> col2;

}

// Storing elements of first matrix.

cout << endl << "Enter elements of matrix 1:" << endl;

//entering values for the rows

for(i = 0; i < row1; ++i)

//entering the values for he columns

for(j = 0; j < col1; ++j)

{

cout << "Enter element a" << i + 1 << j + 1 << " : ";

cin >> a[i][j];

}

// Storing elements of second matrix.

cout << endl << "Enter elements of matrix 2:" << endl;

//entering values for the rows

for(i = 0; i < row2; ++i)

//entering values for the columns

for(j = 0; j < col2; ++j)

{

cout << "Enter element b" << i + 1 << j + 1 << " : ";

cin >> b[i][j];

}

// Initializing elements of matrix multiply to 0.

//entering values for the rows

for(i = 0; i < row1; ++i)

//entering values for the columns

for(j = 0; j < col2; ++j)

{

multiply[i][j]=0;

}

// Multiplying matrix a and b and storing in array multiply.

//tracks the values for the rows in the first matrix

for(i = 0; i < row1; ++i)

//tracks values for the second matrix columns

for(j = 0; j < col2; ++j)

//tracks the values for the first matrix columns

for(k = 0; k < col1; ++k)

{

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

}

// Displaying the multiplication of two matrix.

cout << endl << "Output Matrix: " << endl;

for(i = 0; i < row1; ++i)

for(j = 0; j < col2; ++j)

{

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

if(j == col2-1)

cout << endl;

}

system("Pause");

return 0;

}