using System;

public class MatrixMultiplication

{

public static int[,] Multiply(int[,] a, int[,] b)

{

int n = a.GetLength(0);

int[,] result = new int[n, n];

if (n == 1)

{

result[0, 0] = a[0, 0] \* b[0, 0];

}

else

{

int mid = n / 2;

int[,] a11 = GetSubMatrix(a, 0, 0, mid);

int[,] a12 = GetSubMatrix(a, 0, mid, mid);

int[,] a21 = GetSubMatrix(a, mid, 0, mid);

int[,] a22 = GetSubMatrix(a, mid, mid, mid);

int[,] b11 = GetSubMatrix(b, 0, 0, mid);

int[,] b12 = GetSubMatrix(b, 0, mid, mid);

int[,] b21 = GetSubMatrix(b, mid, 0, mid);

int[,] b22 = GetSubMatrix(b, mid, mid, mid);

int[,] p1 = Multiply(a11 + a22, b11 + b22);

int[,] p2 = Multiply(a21 + a22, b11);

int[,] p3 = Multiply(a11, b12 - b22);

int[,] p4 = Multiply(a22, b21 - b11);

int[,] p5 = Multiply(a11 + a12, b22);

int[,] p6 = Multiply(a21 - a11, b11 + b12);

int[,] p7 = Multiply(a12 - a22, b21 + b22);

int[,] c11 = p1 + p4 - p5 + p7;

int[,] c12 = p3 + p5;

int[,] c21 = p2 + p4;

int[,] c22 = p1 - p2 + p3 + p6;

SetSubMatrix(result, 0, 0, c11);

SetSubMatrix(result, 0, mid, c12);

SetSubMatrix(result, mid, 0, c21);

SetSubMatrix(result, mid, mid, c22);

}

return result;

}

private static int[,] GetSubMatrix(int[,] matrix, int row, int col, int size)

{

int[,] subMatrix = new int[size, size];

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

{

for (int j = 0; j < size; j++)

{

subMatrix[i, j] = matrix[row + i, col + j];

}

}

return subMatrix;

}

private static void SetSubMatrix(int[,] matrix, int row, int col, int[,] subMatrix)

{

int size = subMatrix.GetLength(0);

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

{

for (int j = 0; j < size; j++)

{

matrix[row + i, col + j] = subMatrix[i, j];

}

}

}

}