import java.util.Scanner;

public class ColumnarCipher {

// Encryption function

public static String encrypt(String plainText, String key) {

// Remove spaces and convert key to uppercase

key = key.replaceAll("\\s+", "").toUpperCase();

int keyLength = key.length();

int textLength = plainText.length();

// Calculate number of rows required

int numRows = (int) Math.ceil((double) textLength / keyLength);

// Create a grid to hold the plaintext

char[][] grid = new char[numRows][keyLength];

// Fill the grid with the plaintext

int index = 0;

for (int row = 0; row < numRows; row++) {

for (int col = 0; col < keyLength; col++) {

if (index < textLength) {

grid[row][col] = plainText.charAt(index++);

} else {

grid[row][col] = 'X'; // Padding with 'X' if plaintext is shorter than the grid

}

}

}

// Encrypt the plaintext by reading columns in the order specified by the key

StringBuilder cipherText = new StringBuilder();

for (char c : key.toCharArray()) {

int col = key.indexOf(c);

for (int row = 0; row < numRows; row++) {

cipherText.append(grid[row][col]);

}

}

return cipherText.toString();

}

// Main method

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Get plaintext input from the user

System.out.print("Enter the plaintext: ");

String plainText = scanner.nextLine();

// Get key input from the user

System.out.print("Enter the key: ");

String key = scanner.nextLine();

// Encrypt the plaintext using the Columnar Transposition Cipher

String cipherText = encrypt(plainText, key);

System.out.println("Encrypted text: " + cipherText);

scanner.close();

}

}