

## Pract 2

```
import java.util.Scanner;
```

```
public class Main {
    // Encryption function
    public static String encrypt(String plaintext, int key) {
        int rows = (int) Math.ceil((double) plaintext.length() / key);
        char[][] grid = new char[rows][key];

        // Fill the grid with the plaintext characters row by row
        int index = 0;
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < key; j++) {
                if (index < plaintext.length())
                    grid[i][j] = plaintext.charAt(index++);
                else
                    grid[i][j] = ' ';
            }
        }

        // Read characters from the grid column-wise to generate ciphertext
        StringBuilder ciphertext = new StringBuilder();
        for (int j = 0; j < key; j++) {
            for (int i = 0; i < rows; i++) {
                ciphertext.append(grid[i][j]);
            }
        }

        return ciphertext.toString();
    }

    // Decryption function
    public static String decrypt(String ciphertext, int key) {
        int rows = (int) Math.ceil((double) ciphertext.length() / key);
        char[][] grid = new char[rows][key];

        // Fill the grid with the ciphertext characters column by column
        int index = 0;
        for (int j = 0; j < key; j++) {
            for (int i = 0; i < rows; i++) {
                if (index < ciphertext.length())
                    grid[i][j] = ciphertext.charAt(index++);
                else
                    grid[i][j] = ' ';
            }
        }

        // Read characters from the grid row-wise to generate plaintext
        StringBuilder plaintext = new StringBuilder();
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < key; j++) {
                plaintext.append(grid[i][j]);
            }
        }

        return plaintext.toString().trim();
    }
}
```

```
public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);

    System.out.print("Enter plaintext: ");
    String plaintext = scanner.nextLine();

    System.out.print("Enter key: ");
    int key = scanner.nextInt();

    // Encryption
    String ciphertext = encrypt(plaintext, key);
    System.out.println("Encrypted: " + ciphertext);

    // Decryption
    String decryptedText = decrypt(ciphertext, key);
    System.out.println("Decrypted: " + decryptedText);

    scanner.close();
}
}
```