

## Practiac1-2

**Write a Java/C/C++/Python program to perform encryption and decryption using the method of Transposition technique.**

```
import java.util.Scanner;

public class TranspositionCipher {

    // Method to perform encryption using Transposition technique
    public static String encrypt(String text, int key) {
        // Create a 2D array to store the characters in rows and columns
        char[][] grid = new char[key][((int) Math.ceil((double) text.length() / key))];

        // Fill the grid with the characters from the plaintext
        int index = 0;
        for (int i = 0; i < key; i++) {
            for (int j = 0; j < grid[i].length; j++) {
                if (index < text.length()) {
                    grid[i][j] = text.charAt(index++);
                } else {
                    grid[i][j] = 'X'; // Fill remaining cells with 'X'
                }
            }
        }

        // Read the grid column by column to get the ciphertext
        StringBuilder ciphertext = new StringBuilder();
        for (int j = 0; j < grid[0].length; j++) {
```

```

        for (int i = 0; i < key; i++) {
            ciphertext.append(grid[i][j]);
        }
    }
}

```

```

    return ciphertext.toString();
}

```

// Method to perform decryption using Transposition technique

```

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

```

// Fill the grid with characters from the ciphertext

```

    int index = 0;
    for (int j = 0; j < numCols; j++) {
        for (int i = 0; i < numRows; i++) {
            if (index < ciphertext.length()) {
                grid[i][j] = ciphertext.charAt(index++);
            }
        }
    }
}

```

// Read the grid row by row to get the plaintext

```

StringBuilder plaintext = new StringBuilder();
for (int i = 0; i < numRows; i++) {
    for (int j = 0; j < numCols; j++) {
        if (grid[i][j] != 'X') { // Skip 'X' used for padding

```

```

        plaintext.append(grid[i][j]);
    }
}

return plaintext.toString();
}

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

    // Input the plaintext and the key for the transposition
    System.out.print("Enter plaintext: ");
    String plaintext = scanner.nextLine();

    System.out.print("Enter the key (number of rows): ");
    int key = scanner.nextInt();

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

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

    scanner.close();
}
}

```

