

PROGRAM - 2

Q2 Write a program to perform encryption and decryption using Rail Fence Cipher (transpositional cipher).

Source Code -

```
#include <iostream>
#include <string>
using namespace std;

string encryptRailFence(string text, int key) {
    string *rail = new string[key];
    int row = 0;
    bool down = true;
    for (int i = 0; i < text.length(); ++i) {
        rail[row] += text[i];
        if (row == 0) {
            down = true;
        } else if (row == key - 1) {
            down = false;
        }

        if (down) {
            row++;
        } else {
            row--;
        }
    }

    string result;
    for (int i = 0; i < key; ++i) {
        result += rail[i];
    }
}
```

```

    }

    delete[] rail;

    return result;
}

string decryptRailFence(string cipher, int key) {
    string *rail = new string[key];

    int row = 0;
    bool down = true;

    for (int i = 0; i < cipher.length(); ++i) {
        rail[row] += '*'; // Placeholder for each character

        if (row == 0) {
            down = true;
        } else if (row == key - 1) {
            down = false;
        }

        if (down) {
            row++;
        } else {
            row--;
        }
    }

    int index = 0;
    for (int i = 0; i < key; ++i) {
        for (int j = 0; j < rail[i].length(); ++j) {
            if (rail[i][j] == '*' && index < cipher.length()) {
                rail[i][j] = cipher[index++];
            }
        }
    }

    string result;

```

```

row = 0;
down = true;
for (int i = 0; i < cipher.length(); ++i) {
    result += rail[row][0];

    rail[row].erase(rail[row].begin());

    if (row == 0) {
        down = true;
    } else if (row == key - 1) {
        down = false;
    }

    if (down) {
        row++;
    } else {
        row--;
    }
}

delete[] rail;

return result;
}

int main() {
    string text;
    int key;
    char choice;

    cout << "Enter the text: ";
    getline(cin, text);

    cout << "Enter the number of rails: ";
    cin >> key;

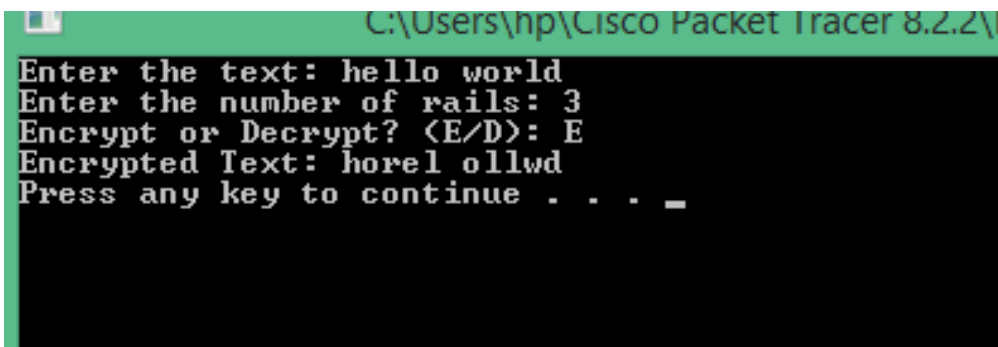
    cout << "Encrypt or Decrypt? (E/D): ";
    cin >> choice;

    if (choice == 'E' || choice == 'e') {

```

```
    string encryptedText = encryptRailFence(text, key);  
    cout << "Encrypted Text: " << encryptedText << endl;  
} else if (choice == 'D' || choice == 'd') {  
    string decryptedText = decryptRailFence(text, key);  
    cout << "Decrypted Text: " << decryptedText << endl;  
} else {  
    cout << "Invalid choice. Please enter E for encryption or D for  
    decryption." << endl;  
}  
return 0;  
}
```

OUTPUT -



```
C:\Users\hp\Cisco Packet Tracer 8.2.2\  
Enter the text: hello world  
Enter the number of rails: 3  
Encrypt or Decrypt? (E/D): E  
Encrypted Text: horel ollwd  
Press any key to continue . . . _
```