Name : Harshal Kodgire
Batch : B1
Subject : CNS lab
Topic : Assignment 5

Aim : - Given the plain text, encrypt it using Rail Fence Algorithm

Theory :
The rail fence cipher (also called a zigzag cipher) is a form of transposition cipher. It derives its name from the way in which it is encoded.

Code :

```
#include<bits/stdc++.h>
using namespace std;

int main()
{
    string plainText;
    int key;

    cout<<"\n Enter plain text : ";
    getline(cin,plainText);

    // Removing spaces and converting to small from plaintext
    string temp = "";
    for(int i=0;i<plainText.size();i++)
    {
        if(plainText[i]!=' ')
        temp += plainText[i];
    }
    plainText = temp;

    for(int i=0;i<plainText.size();i++)
    {
        if(plainText[i]>=65 && plainText[i]<=90)
        plainText[i] += 32;
    }

    int n = plainText.size();

    cout<<"\n Enter key : ";
```

```
    cin>>key;

    vector<vector<char>> matrix(key);

    int row = 0;
    int flg = 1;
    for(int i=0;i<plainText.size();i++)
    {
        matrix[row].push_back(plainText[i]);
        row += flg;
        if(row == 0)
        flg = 1;

        if(row==key-1)
        flg = -1;
    }

    string cipherText;
    for(int i=0;i<key;i++)
    {
        for (int j=0;j<matrix[i].size();j++)
        cipherText += matrix[i][j];
    }

    cout<<"\n Cipher text is : " << cipherText;

    // Decryption

    vector<vector<int>> matd(key);
    row = 0;
    flg = 1;
    for (int i = 1; i <= n; i++)
    {
        matd[row].push_back(i);
        row += flg;
        if (row == (key-1))
        flg = -1;
        if (row == 0)
        flg = 1;
    }

    vector<int> dd;
    for (int i=0;i<key;i++)
```

```
    {
        for (int j = 0; j < matrix[i].size(); j++)
        dd.push_back(matd[i][j]);
    }

    cout << endl;

    map<int, char> m;
    for (int i = 0; i < n; i++)
        m[dd[i]] = cipherText[i];

    string plain = "";
    for (int i=1;i<=n;i++)
        plain += m[i];

    cout << "\n Plain text after decription is : " << plain<<endl;

    return 0;
}
```

Output :

```
D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab>g++ Assignment_5.cpp

D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab>a.exe

 Enter plain text : GeeksforGeeks

 Enter key : 3

 Cipher text is : gsgsekfrekeoe

 Plain text after decription is: geeksforgeeks
```

```
D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab>g++ Assignment_5.cpp

D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab>a.exe

 Enter plain text : Harshal

 Enter key : 5

 Cipher text is : harlsah

 Plain text after decription is : harshal

D:\WCE_ENGINEERING\BTECH_SEM1\CNS lab>g++ Assignment_5.cpp
```