Program: 5 **Encryption and Decryption Using Rail Fence Cipher**

Date:

AIM

ALGORITHM

CODE

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

string railCipherEncrypt(string text, int key) {
    int l = text.length();
    string result;
    for (int i=0; i<key; i++) {
        int j;
        if (i == 0) {
            j = 0;
        } else if (i == key-1) {
            j = key - 1;
        } else {
            j = i;
        }
        int inv = 0;
        while (j < l) {
            result.push_back(text[j]);
            if (i == 0 || i == key-1) {
                j += key + (key - 2);
            } else {
                if (inv == 0) {
                    j += 2 * (key - (i+1));
                    inv = 1;
                } else {
                    j += 2 * i;
                    inv = 0;
                }
            }

        }

    }
```

```
    return result;
}

string railCipherDecrypt(string text, int key) {
    int l = text.length();
    string result(l, '*');
    int iter = 0;
    for (int i=0; i<key; i++) {
        int j;
        if (i == 0) {
            j = 0;
        } else if (i == key-1) {
            j = key - 1;
        } else {
            j = i;
        }
        int inv = 0;
        while (j < l) {
            result[j] = text[iter];
            iter++;
            if (i == 0 || i == key-1) {
                j += key + (key - 2);
            } else {
                if (inv == 0) {
                    j += 2 * (key - (i+1));
                    inv = 1;
                } else {
                    j += 2 * i;
                    inv = 0;
                }
            }
        }
    }
```

```
    return result;
}

int main() {

    int choice;
    int key;
    cout << "\nEnter the key: ";
    cin >> key;
    while (1) {
        cout << "\n\n1. Encrypt" << endl;
        cout << "2. Decrypt" << endl;
        cout << "3. Exit" << endl;
        cout << "Enter Choice: ";
        cin >> choice;
        string text;
        if (choice == 1) {
            cout << "\nEnter plaintext: ";
            std::getline(std::cin >> std::ws, text);
            cout << railCipherEncrypt(text, key);
        } else if (choice == 2) {
            cout << "\nEnter cipher: ";
            std::getline(std::cin >> std::ws, text);
            cout << railCipherDecrypt(text, key);
        } else if (choice == 3) {
            cout << "Exiting.." << endl;
            break;
        } else {
            cout << "Invalid Choice" << endl;
        }
    }
    return 0;
}
```

OUTPUT

```
C:\Users\alish\Documents\GitHub\Network-Security-Lab\5>main.exe

Enter the key: 5


1. Encrypt
2. Decrypt
3. Exit
Enter Choice: 1

Enter plaintext: ALI IZZATH SHAZIN
ATNLAHIIZ Z ZSAIH

1. Encrypt
2. Decrypt
3. Exit
Enter Choice: 2

Enter cipher: ATNLAHIIZ Z ZSAIH
ALI IZZATH SHAZIN

1. Encrypt
2. Decrypt
3. Exit
Enter Choice: 3
Exiting..
```

RESULT

Thus, the program to encrypt and decrypt texts using rail fence cipher is executed successfully.