**Coding:**

import java.util.Arrays;

import java.util.Scanner;

public class CustomRailFence {

public static String encryptMessage(String plaintext, int rails) {

char[][] railMatrix = new char[rails][plaintext.length()];

for (int i = 0; i < rails; i++)

Arrays.fill(railMatrix[i], '\n');

boolean dirDown = false;

int row = 0, col = 0;

for (int i = 0; i < plaintext.length(); i++) {

if (row == 0 || row == rails - 1)

dirDown = !dirDown;

railMatrix[row][col++] = plaintext.charAt(i);

if (dirDown)

row++;

else

row--;

}

StringBuilder result = new StringBuilder();

for (int i = 0; i < rails; i++)

for (int j = 0; j < plaintext.length(); j++)

if (railMatrix[i][j] != '\n')

result.append(railMatrix[i][j]);

return result.toString();

}

public static String decryptMessage(String cipher, int rails) {

char[][] railMatrix = new char[rails][cipher.length()];

for (int i = 0; i < rails; i++)

Arrays.fill(railMatrix[i], '\n');

boolean dirDown = true;

int row = 0, col = 0;

for (int i = 0; i < cipher.length(); i++) {

if (row == 0)

dirDown = true;

if (row == rails - 1)

dirDown = false;

railMatrix[row][col++] = '\*';

if (dirDown)

row++;

else

row--;

}

int index = 0;

for (int i = 0; i < rails; i++)

for (int j = 0; j < cipher.length(); j++)

if (railMatrix[i][j] == '\*' && index < cipher.length())

railMatrix[i][j] = cipher.charAt(index++);

StringBuilder result = new StringBuilder();

row = 0;

col = 0;

for (int i = 0; i < cipher.length(); i++) {

if (row == 0)

dirDown = true;

if (row == rails - 1)

dirDown = false;

if (railMatrix[row][col] != '\*')

result.append(railMatrix[row][col++]);

if (dirDown)

row++;

else

row--;

}

return result.toString();

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter a string: ");

String input = sc.nextLine();

System.out.println("Enter the number of rails: ");

int rails = sc.nextInt();

sc.nextLine();

System.out.println("Choose an option:");

System.out.println("1. Encrypt");

System.out.println("2. Decrypt");

int choice = sc.nextInt();

sc.nextLine();

if (choice == 1) {

System.out.println("Encrypted Message: " + encryptMessage(input, rails));

} else if (choice == 2) {

System.out.println("Decrypted Message: " + decryptMessage(input, rails));

} else {

System.out.println("Invalid choice!");

}

sc.close();

}

}

Output:

