You and your best friend Dhruvi have taken the Cryptography course in your respective colleges. Dhruvi often boasts
yptography and puzzles, a heated debate starts between the two of you regarding who is better at solving puzzles. T
. You both agree to text via WhatsApp using the ciphertext generated by your ciphers, which means that Dhruvi will s
you'll respond by sending your message as the ciphertext generated by your cipher. The challenge is that you will ha
ils to do so first loses the challenge.

Your cipher:

To prove that you are better than Dhruvi, you decide to dive deep into the pre-existing ciphers and upon doing so yo
Dhruvi isn't just "all talk and no brains", you decide to take things up a notch by double encrypting your message usin
ion from the recently learned different variations of DES algorithm, you decide to implement a Rail fence transpositio
ard cipher.

The Encryption algorithm:

This algorithm is a product cipher of two ciphers: Straddle Checkerboard and Rail fence Transposition. The encryptin
on while the second phase is transposition.

During the substitution phase, we substitute each letter with either one or more digits retrieved from the straddle ch
oard)
After this, impose rail fence transposition on the output of the straddle checkerboard. (https://privacycanada.net/rai
Refer to the following link for a detailed explanation with example: http://practicalcryptography.com/ciphers/straddl

NOTE:

Remember we stop the algorithm after encoding it with the initial matrix setup. We DO NOT proceed to add a new s
in using the same setup during encryption.
Please keep in mind that the above algorithm is that of Encryption whereas you are asked to write the code for Decry
Input Format

The input consists of 4 lines where:

The first line consists of the "key" for straddling checkerboard
The second line consists of digits excluded from the first row of the straddle checkerboard
The third line consists of the ciphertext to decrypt
The fourth line consists of an integer which will be the "Key" (denoting the number of rows to be used) for the rail fen
Constraints

The ciphertext to decrypt consists of a permutation of the digits [0-9] only.

Output Format

Plain text – String

Sample Input 0

XZDECAMRQKUYBLFOGVITWJHPSN
2 7
377767272277661122967521077712672277
3
Sample Output 0

DONTASKTAFORSOLUTION
Explanation 0

Note: Remember we stop the algorithm after encoding it with the initial matrix setup. We DO NOT proceed to add a
rs again using the same setup during encryption.