**Problem: Be on the lookout for your registration number.**

The following string contains the registration numbers in encrypted form of all the students in the class, placed randomly:



The registration number has been encrypted using two keys: *key1* and *key2*. The encryption scheme uses the following dictionary for encryption:

ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789-

Your registration number string (e.g. SP22-BSE-008) was transformed into an encrypted form through a two-step shifting and reversing process:

* *First Shifting Process:* Each character in your registration number string was shifted forward by a certain number of positions (called key1) based on a given dictionary. For example, with 3 as the key, character A would be encrypted as D while character 9 would be encrypted as B
* *Reversal:* After applying the first shift, the resulting string was reversed.
* *Second Shifting Process:* Each character of the reversed string was then shifted again by a different number of positions (called key2).

The given dictionary includes only uppercase English letters (A-Z), numbers (0-9), and a dash (-). As a result, each character in your registration number string was shifted based on this dictionary of 37 characters. Both *key1* and *key2* are unknown and could range from 1 to 36.

**Example of the Encryption Scheme:**

To create the encrypted form of "SP22-BSE-008", you will go through three steps: two shifts (with different keys) and one reversal in between.

Let’s assume:

* *key1* is 19
* *key2* is 7

*Step 1*: First Shifting Process with *key1* = 19

Input: SP22-BSE-008, Output: A8KKSUAXSIIQ

*Step 2*: Reverse the String

Input: A8KKSUAXSIIQ, Output: QIISXAUSKK8A,

*Step 3*: Second Shifting Process with *key2* = 7

Input: QIISXAUSKK8A, Output: XPPZ4H1ZRREH

*Final Encrypted String:*

Original: SP22-BSE-008, Encrypted: XPPZ4H1ZRREH, key1: 19, key2: 7

Write a program in Java that determines where your registration number exists in the large encrypted string in its encrypted form. The program should output the index in the large encrypted string where the encrypted form of your registration number string begins, and also print the keys, key1 and key2, used to encrypt the original string."

Within your program, you must define two functions *applyShift* and *reverseString* apart from the main function.