Note: This problem is based on the previous problem "A Real-Life Problem". Don't try to solve this problem before solving the previous one.

After having transformed the course from English language to Revox language, a mystery started to take place. All the courses disappeared suddenly. Of course, someone, perhaps a spy, has stolen them all. The exam is going to take place next week, and all your classmates are counting on you to restore the English version of the course so that they can study for the exam as soon as possible. All you have now is the course written in Revox language and you still remember the way of converting a text from English to Revox. You just have to do the reverse now: convert the text back to English.

Input format:

- The first line will contain a string that describes the new order of the alphabet. It's guaranteed this string is a shuffled version of the string "abcdefghijklmnopqrstuvwxyz"
- 26 lines follows, each line contains a sequence of bits to which the ith character ***of the English*** alphabet is mapped.
- The last line will contain a text written in Revox language. (It's guaranteed that the given Revox text is a valid text).

Output format:

Print the text after converting it back to English language.

Sample input:

qazxswedcvfrtgbnhyujmklpoi

11001

11000

10111

10110

10101

10100

10011

10010

10001

10000

01111

01110

01101

01100

01011

01010

01001

01000

00111

00110

00101

00100

00011

00010

00001

00000

01000101111001100111010010000 1 00101010110010110000001110011 0

Sample output:

linear system