

K Knitting Patterns

Time limit: 3s

It is the most relaxing hobby of anyone's grandma: knitting! Your grandma uses a lot of wool, even for the most simple patterns that she is knitting. You are sure that she can be more efficient with her wool, so you decide to write a program that calculates the most efficient use of wool.

A knitting pattern is a long list of stitches, where each stitch can use a different colour.¹ There is a cost for starting or ending the use of a certain colour, for using the wool in a stitch, and for letting it strand through the back unused. For a given knitting pattern, calculate the least possible amount of wool required for every colour of wool.



Knitting Grandma.
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As an example, consider the first sample case. There are three colours of wool (red, green, and blue). The red wool is used at the start and at the end of the pattern: it is most efficient to start and stop using the red wool for both parts separately ($4 \cdot 4 = 16$ cost), and it is used in ten stitches ($10 \cdot 2 = 20$ cost), giving a total cost of 36. The green and blue wool have the same cost: start once (4 cost), use for five stitches ($5 \cdot 2 = 10$ cost), strand along the back for four stitches ($4 \cdot 1 = 4$ cost), and stop using the colour (4 cost), giving a total cost of 22.

Input

The input consists of:

- One line with three integers a , b , and c ($1 \leq a < b < c \leq 1000$), the cost of letting the wool strand through the back unused, the cost of using the wool in a stitch, and the cost of starting or ending the use of a colour of wool.
- One line with a string w ($1 \leq |w| \leq 26$), representing the unique letters used for denoting stitch colours.
- One line with a string p ($1 \leq |p| \leq 10^6$), representing the stitch colours of the knitting pattern.

All stitch colours use English lowercase letters (a–z).

Output

Output, for every colour of wool, in the order as they are in w , the amount of wool used in this pattern.

¹Most real-life knitting patterns are two-dimensional, but since you zig-zag through such a pattern while knitting, the input is one-dimensional for simplicity.

Sample Input 1

1 2 4	36
rgb	22
rrrrrgbgbgbgbgbrrrrr	22

Sample Output 1**Sample Input 2**

2 4 1000	2024
ab	2032
abbbbbbbba	

Sample Output 2