

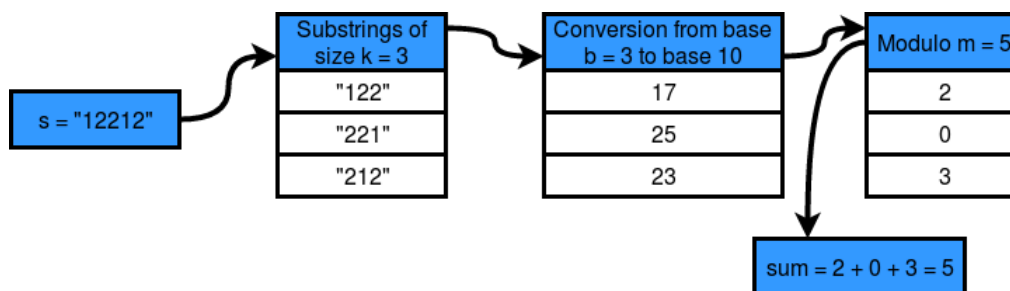
Numeric String



Alexa performs the following sequence of operations on a string, s , of integers:

1. Make a list of all substrings of s that are a given length, k .
2. Consider each substring to be a base b number (where b is given). Convert each substring in the list from base b to base 10 (i.e., convert $(\text{substring})_b \Rightarrow (\text{substring})_{10}$), replacing the base b numbers with base-10 numbers.
3. Replace each base-10 number with its value modulo a given m (i.e., $(x)_{10} \Rightarrow (x)_{10} \bmod m$).
4. Calculate the *magic number* by summing all the integers in the final list.

The diagram shows an example where $s = 12212$, $k = 3$, $b = 3$ and $m = 5$:



Given s , k , b , and m , can you find the magic number?

Input Format

The first line contains a string denoting s .

The second line contains three space-separated integers describing the respective values of k (the substring length), b (the base), and m (the modulo).

Constraints

- $1 \leq |s| \leq 3 \cdot 10^5$
- $1 \leq k \leq |s|$
- $1 \leq m \leq 1000$
- $2 \leq b \leq 10$
- String s is composed of decimal digits in the inclusive range $[0, b - 1]$, so each substring of length k always forms a valid base b number.
- String s may contain leading zeros.

Subtasks

- $1 \leq |s| \leq 3 \cdot 100$ for 60% of the maximum score.

Output Format

Print an integer denoting the magic number.

Sample Input 0

```
12212
3 3 5
```

Sample Output 0

5

Explanation 0

Given $s = 12212$, substring length $k = 3$, base $b = 3$, and modulo $m = 5$, we calculate the following:

Substrings of length $k = 3$ Convert $(x)_{b=3} \Rightarrow (x)_{10}$ Modulo $m = 5$

122	17	$17 \bmod 5 = 2$
221	25	$25 \bmod 5 = 0$
212	23	$23 \bmod 5 = 3$

We then print the final sum, $2 + 0 + 3 = 5$, as our answer.

Sample Input 1

```
111101
4 2 15
```

Sample Output 1

```
27
```

Explanation 1

Given $s = 111101$, substring length $k = 4$, base $b = 2$, and modulo $m = 15$, we calculate the following:

Substrings of length $k = 4$ Convert $(x)_{b=2} \Rightarrow (x)_{10}$ Modulo $m = 15$

1111	15	$15 \bmod 15 = 0$
1110	14	$14 \bmod 15 = 14$
1101	13	$13 \bmod 15 = 13$

We then print the final sum, $0 + 14 + 13 = 27$, as our answer.

Sample Input 2

```
0111
2 10 100
```

Sample Output 2

```
23
```

Explanation 2

In this sample, the substrings are 01, 11 and 11.