

Available memory: 64 MB.

Byteasar likes to play with his random (well, actually pseudorandom) bits generator, which he has found on his computer. This generator works in a very simple way. The moment the computer is turned on, an integer in the range between 0 and $m - 1$ is chosen automagically. This integer is called the *seed* of the generator; we will use variable z to represent it. Then, in order to generate a random bit, the following function is called. It computes a new value of the seed which is then used to generate a single bit:

```
z := [(z · a + c)/k] mod m
if z < [m/2] then
    return 0
else
    return 1
```

The numbers a , c , k are some constants. Byteasar has called this function n times and has thus obtained a sequence of bits b_1, b_2, \dots, b_n . Now he is wondering what is the number of different possible values of the initial seed.

Input

The first line of the input contains five integers a , c , k , m and n ($0 \leq a, c < m$, $1 \leq k < m$, $2 \leq m \leq 1\,000\,000$, $1 \leq n \leq 100\,000$). The second line contains an n -character string consisting of digits 0 and 1; the i -th digit of the string represents the bit b_i .

Output

You should output one integer representing the number of integers from the range between 0 and $m - 1$ which could have been the initial seed of the generator.

Example

For the input data:

```
3 6 2 9 2
10
```

the correct result is:

```
4
```

Explanation of the example: The initial seed of the generator could have been equal to 1, 2, 7 or 8.