Bits Generator — GEN

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:

$z := \lfloor (z \cdot a + c)/k \rfloor \bmod m$
if $z < \lfloor m/2 \rfloor$ 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 $b_1, b_2, \ldots, b_n$. 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 ($0 \leqslant a, c < m$, $1 \leqslant k < m$, $2 \leqslant m \leqslant 1\,000\,000$, $1 \leqslant n \leqslant 100\,000$). 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.

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