Task: KUR
Speed reading course

Olimpiada Informatyczna

XXII OI, Stage II, Day two. Source file `kur.*` Available memory: 128 MB. *12.02.2015*

Byteasar has enrolled in a speed reading course, which has taught him many perception improving exercises. His favorite one is finding a pattern in a sequence of symbols. For this exercise, Byteasar has a computer generate a very long sequence of zeros and ones as follows. He chooses four integers n, a, b, and p such that n and a are coprime, and the computer generates a sequence $c_0, c_1, \ldots, c_{n-1}$, where $c_i = 0$ if and only if $(ai+b) \bmod n < p$. Finally, Byteasar comes up with another, shorter sequence of m symbols $w_0, w_1, \ldots, w_{m-1}$. Set up with these, his task is to find all occurrences of the shorter sequence in the one generated by the computer as quickly as possible. He has asked your help in writing a program that will verify if indeed he found all the occurrences.

Input

The first line of the standard input contains five integers, n, a, b, p, and m ($2 \leq n \leq 1\,000\,000\,000$, $1 \leq p, a, b, m < n$, $1 \leq m \leq 1\,000\,000$), separated by single spaces. The numbers a and n are coprime. In the second line, there is a word $w_0, w_1, \ldots, w_{m-1}$, consisting of m symbols, each either `0` or `1`.

The following mutually exclusive classes form a subset of all the test inputs:

- in tests worth 8% of the total score, $n \leq 1000$ holds;
- in other tests worth 8% of the total score, $n \leq 1\,000\,000$ holds;
- in yet other tests worth 66% of the total score, $m \leq 1000$ holds.

Output

The first and only line of the standard output should contain an integer equal to the number of occurrences of the sequence $w_0, w_1, \ldots, w_{m-1}$ in the sequence $c_0, c_1, \ldots, c_{n-1}$.

Example

For the input data:	the correct result is:
`9 5 6 4 3` `101`	`3`

Explanation: For $n = 9$, $a = 5$, $b = 6$, and $p = 4$, the computer generates the sequence as follows:

i	0	1	2	3	4	5	6	7	8
$ai + b$	6	11	16	21	26	31	36	41	46
$(ai + b) \bmod n$	6	2	7	3	8	4	0	5	1
c_i	1	0	1	0	1	1	0	1	0

The sequence `101` occurs thrice in the sequence `101011010`.

Sample grading tests:

`1ocen:` looking for occurrences of `0010` in `10010000100100100100`;

`2ocen:` looking for occurrences of `00000` in `00000001000000010000000000000001`;

`3ocen:` $n = 1\,000\,000\,000$, $m = 1\,000\,000$. Looking for occurrences of `011...11` (a single 0 followed by ones only) in `00...0011...110` (499 999 999 zeros, 500 000 000 ones, and a single zero).