

C. Alternating Sum

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given two integers a and b . Moreover, you are given a sequence s_0, s_1, \dots, s_n . All values in s are integers 1 or -1 . It's known that sequence is k -periodic and k divides $n + 1$. In other words, for each $k \leq i \leq n$ it's satisfied that $s_i = s_{i-k}$.

Find out the **non-negative** remainder of division of $n \sum_{i=0}^n s_i a^{n-i} b^i$ by $10^9 + 9$.

Note that the modulo is unusual!

Input

The first line contains four integers n, a, b and k ($1 \leq n \leq 10^9, 1 \leq a, b \leq 10^9, 1 \leq k \leq 10^5$).

The second line contains a sequence of length k consisting of characters '+' and '-'.

If the i -th character (0-indexed) is '+', then $s_i = 1$, otherwise $s_i = -1$.

Note that only the first k members of the sequence are given, the rest can be obtained using the periodicity property.

Output

Output a single integer — value of given expression modulo $10^9 + 9$.

Processing math: 96%

Tinkoff Internship Warmup Round 2018 and Codeforces Round #475 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

Examples**input**[Copy](#)2 2 3 3
+-+**output**[Copy](#)

7

input[Copy](#)4 1 5 1
-**output**[Copy](#)

999999228

Note

In the first example:

$$(n \sum_{i=0} s_i a^{n-i} b^i) = 2^2 3^0 - 2^1 3^1 + 2^0 3^2 = 7$$

In the second example:

$$(\sum \limits_{i=0}^n s_{\{i\}} a^{n-i} b^{\{i\}}) = -1^{\{4\}} 5^{\{0\}} - 1^{\{3\}} 5^{\{1\}} - 1^{\{2\}} 5^{\{2\}} - 1^{\{1\}} 5^{\{3\}} - 1^{\{0\}} 5^{\{4\}} = -781 \equiv 999999228 \pmod{10^{\{9\}} + 9}.$$

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[→ Clone Contest to Mashup](#)

You can clone this contest to a mashup.

[Clone Contest](#)[→ Submit?](#)Language: GNU G++14 6.4.0Choose file: [Choose File](#) No file chosen

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.


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Submission	Time	Verdict
37407913	Apr/17/2018 18:22	Time limit exceeded on pretest 7
37405514	Apr/17/2018 18:01	Time limit exceeded on pretest 7
37405090	Apr/17/2018 17:57	Time limit exceeded on pretest 7
37404896	Apr/17/2018 17:55	Memory limit exceeded on pretest 1

[→ Problem tags](#)[math](#) [matrices](#) [number theory](#)

No tag edit access

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- Announcement 

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