

Problem H. Lucky Tickets

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

The government plans a transport reform which will change ticket numbers. The new ticket numbers will consist of q digits in n -ary number system, where q is a prime number. Leading zeros are **allowed**.

A ticket is considered lucky if the product of all its digits added to the sum of all its digits, taken modulo n , equals s . Additionally, every lucky ticket has a degree of luckiness: the degree of luckiness of the ticket with digits $a_1 a_2 \dots a_q$ equals

$$(a_1 + 1)(a_2 + 2) \dots (a_q + q) + 2^0 a_1 + 2^1 a_2 + \dots + 2^{q-1} a_q.$$

For reform report, it is needed to calculate the sum of luckiness of all lucky tickets modulo q .

Input

The first line contains three integers n , s and q ($2 \leq n \leq 10^6$, $0 \leq s < n$, $2 \leq q \leq 10^6$, q is prime).

Output

Print the sum of luckiness of all lucky tickets modulo q .

Examples

<i>standard input</i>	<i>standard output</i>
2 0 2	0
10 9 2	1
3 2 3	2