B. Pasha and Phone

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Pasha has recently bought a new phone `jPager` and started adding his friends' phone numbers there. Each phone number consists of exactly n digits.

Also Pasha has a number k and two sequences of length n / k (n is divisible by k) $a_1, a_2, ..., a_{n / k}$ and $b_1, b_2, ..., b_{n / k}$. Let's split the phone number into blocks of length k. The first block will be formed by digits from the phone number that are on positions $1, 2,..., k$, the second block will be formed by digits from the phone number that are on positions $k + 1$, $k + 2$, ..., $2 \cdot k$ and so on. Pasha considers a phone number `good`, if the i-th block doesn't start from the digit b_i and is divisible by a_i if represented as an integer.

To represent the block of length k as an integer, let's write it out as a sequence $c_1, c_2,...,c_k$. Then the integer is calculated as the result of the expression $c_1 \cdot 10^{k - 1} + c_2 \cdot 10^{k - 2} + ... + c_k$.

Pasha asks you to calculate the number of `good` phone numbers of length n, for the given k, a_i and b_i. As this number can be too big, print it modulo $10^9 + 7$.

Input

The first line of the input contains two integers n and k ($1 \le n \le 100\,000$, $1 \le k \le min(n, 9)$) — the length of all phone numbers and the length of each block, respectively. It is guaranteed that n is divisible by k.

The second line of the input contains n / k space-separated positive integers — sequence $a_1, a_2, ..., a_{n / k}$ ($1 \le a_i < 10^k$).

The third line of the input contains n / k space-separated positive integers — sequence $b_1, b_2, ..., b_{n / k}$ ($0 \le b_i \le 9$).

Output

Print a single integer — the number of good phone numbers of length n modulo $10^9 + 7$.

Examples

input
6 2 38 56 49 7 3 4

output
8

input
8 2 1 22 3 44 5 4 3 2

output
32400

Note

In the first test sample `good` phone numbers are: `000000`, `000098`, `005600`, `005698`, `380000`, `380098`, `385600`, `385698`.