Problem D. Determinant Strikes Back

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

Dinara has an integer x and two n arrays $a_1, \ldots, a_n$, $b_1, \ldots, b_n$. She makes an $n \times n$ matrix M where

$$M_{i,j} = \begin{cases} x + a_i b_j & \text{when } i = j \\ a_i b_j & \text{otherwise} \end{cases}$$

Find the determinant of the matrix M modulo $(10^9 + 7)$.

Input

The input consists of several test cases terminated by end-of-file.

The first line of each test case contains two integers n and x. The second line contains n integers $a_1, \ldots, a_n$. The third line contains n integers $b_1, \ldots, b_n$.

- $1 \le n \le 10^5$
- $0 \le x, a_i, b_i \le 10^9$
- The sum of n does not exceed 10^6.

Output

For each test case, print an integer which denotes the result.

Examples

standard input	standard output
2 1 0 0 0 0 2 1 1000000000 1000000000 1000000000 1000000000 3 2 2 3 3 2 3 3	1 99 96