

Problem I. Polynomials

Input file: *standard input*
 Output file: *standard output*
 Time limit: 3 seconds
 Memory limit: 512 mebibytes

You are given k different polynomials $a_1(x), \dots, a_k(x)$ and m different polynomials $b_1(x), \dots, b_m(x)$.

The degree of each polynomial $a_i(x)$ ($1 \leq i \leq k$) does not exceed n , and the degree of each polynomial $b_j(x)$ ($1 \leq j \leq m$) does not exceed $2n$.

For each polynomial $b_j(x)$ ($1 \leq j \leq m$), you are to find the number of pairs (u, v) ($u \leq v$) such that $a_u(x) \cdot a_v(x) = b_j(x)$.

Input

The first line contains three integers k , m and n ($1 \leq k \leq 40\,000$, $1 \leq m \leq 150$, $0 \leq n \leq 20$).

Each of the following k lines contains $(n + 1)$ integers — coefficients $a_{i,0}, a_{i,1}, \dots, a_{i,n}$ of the polynomial $a_i(x) = a_{i,0} + a_{i,1}x + \dots + a_{i,n-1}x^{n-1} + a_{i,n}x^n$ ($1 \leq i \leq k$).

Each of the following m lines contains $(2n + 1)$ integers — coefficients $b_{j,0}, b_{j,1}, \dots, b_{j,2n}$ of the polynomial $b_j(x) = b_{j,0} + b_{j,1}x + \dots + b_{j,2n-1}x^{2n-1} + b_{j,2n}x^{2n}$ ($1 \leq j \leq m$).

All the coefficients do not exceed 10^6 by absolute value.

Output

Output exactly m lines, j -th of them must contain the number of integer pairs (u, v) ($1 \leq u \leq v \leq k$) such that $a_u(x) \cdot a_v(x) = b_j(x)$.

Examples

standard input	standard output
2 2 0 -2 2 -4 4	1 2
6 3 2 0 -1 1 0 1 1 -1 0 1 0 1 0 -1 1 0 1 1 0 0 -1 0 1 0 0 0 -1 0 1 0 0 1 0 -1	3 1 0