Subsequence Counting

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Given a sequence $\{t\}$ of length m and a sequence $\{s\}$ of length L, where $\{s\}$ is composed of n consecutive segments from left to right. The i-th segment contains l_i identical elements, each with a value of v_i.

The sequence $\{s'\}$ is formed by shuffling the sequence $\{s\}$ according to a certain rule. Specifically, the sequence $\{s'\}$ satisfies $s'_{i \cdot k \bmod L} = s_i$ (indices start from 0). Here, k is a given positive integer constant, and it is guaranteed that $\gcd(k, L) = 1$.

Find the number of times $\{t\}$ appears as a subsequence in $\{s'\}$. Formally, if there is a strictly increasing sequence of indices $0 \le i_1 < i_2 < \cdots < i_m < L$ such that for each $j = 1, 2, \ldots, m$, $t_j = s'_{i_j}$, then $\{t\}$ is considered a subsequence of $\{s'\}$ at these indices. You need to determine how many different index groups satisfy this condition. Since the answer may be large, output the result modulo 998244353.

Input

The first line contains four integers n, m, k, L ($1 \le n \le 2 \times 10^3$, $1 \le m \le 10$, $1 \le k < L \le 10^9$, $\gcd(k, L) = 1$).

The second line contains m integers representing the sequence $\{t\}$ ($1 \le t_i \le 10^3$).

The next n lines describe the sequence $\{s\}$, each containing two integers l_i, v_i ($1 \le l_i \le 10^9$, $1 \le v_i \le 10^3$). It is guaranteed that $\sum_{i=1}^{n} l_i = L$.

Output

Output a single integer, representing the result modulo 998244353.

Examples

standard input	standard output
4 2 17 27 3 1 10 3 6 1 10 3 1 1	76
5 3 1789 15150 555 718 726 72 555 1029 718 5807 726 1002 718 7240 555	390415327