Sequences

Problem statement

You are on a company visit to Shopee. During the office tour, you noticed that there seems to be a random scribbling on one of the walls. After looking at it closely, you noticed it is actually an algorithm question! Below is the question:

You are given **N** functions f(i, j) with parameters **A**i, **B**i, **C**i, where the value of f(i, j) is equal to **A**i x j2 + **B**i for each 1 ≤ j ≤ **C**i. Find how many sequences (i1, j1), (i2, j2), … , (iM, jM) of length **M** are there in which the following holds:

f(i1, j1) + f(i2, j2) + … + f(i**M**, j**M**) is divisible by **K**

Two sequences are different if there is at least one index k, such that ik ≠ ik' or jk ≠ jk'

You quickly take note of the question, as maybe it is a draft for an interview question. Solve the question to increase your chance of acing the future interview at Shopee!

Input

The first line contains 3 integers **N** (1 ≤ **N** ≤ 5,000), **M** (1 ≤ **M** ≤ 1,000,000,000), and **K** (1 ≤ **K** ≤ 2,000).

The next **N** lines each contains 3 integers **A**i, **B**i, (0 ≤ **A**i, **B**i < **K**) and **C**i (1 ≤ **C**i ≤ 1,000,000,000), denoting the parameters for the i-th function.

Output

One line containing a single integer, the number of the sequence. Since this number can be very large, output its value modulo $10^9 + 7$.

Sample explanation

Below are all the possible sequences:

1. (1, 1), (1, 1)
2. (1, 1), (1, 2)
3. (1, 1), (2, 1)
4. (1, 2), (1, 1)
5. (1, 2), (1, 2)
6. (1, 2), (2, 1)
7. (2, 1), (1, 1)
8. (2, 1), (1, 2)
9. (2, 1), (2, 1)
10. (2, 2), (2, 2)
11. (2, 3), (3, 1)
12. (3, 1), (2, 3)

Sample input

3 2 6

0 3 2

1 2 3

2 5 1

Sample output

12