

Problem C. Cryptography Problem

Input file: standard input
Output file: standard output
Time limit: 5 seconds
Memory limit: 1024 megabytes

You are given m equations of the form

$$a_i \cdot x + err_i \equiv c_i \pmod{p}.$$

Here, err_i is an unknown random error term, chosen uniformly at random from $-\lfloor \frac{p}{200} \rfloor, \dots, \lfloor \frac{p}{200} \rfloor$, while a_i, c_i and p are known to you.

You know that these equations hold for some unknown integer x . Find one such x .

Input

In the first line, T ($1 \leq T \leq 500$) — the number of test cases. For each test case:

- In the first line, m, p ($50 \leq m \leq 100, 10^{15} \leq p \leq 10^{18}$).
- In the next m lines, a_i, c_i ($0 \leq a_i, c_i \leq p - 1$).
- It's guaranteed that p is a prime, a_i, x are chosen uniformly at random from 0 to $p - 1$, and c_i is computed by $(a_i \cdot x + err_i) \bmod p$, err_i is an integer chosen uniformly at random from $-\lfloor \frac{p}{200} \rfloor, \dots, \lfloor \frac{p}{200} \rfloor$.

Output

For each test case, one integer — the answer. If there are multiple solutions, you may output any.

Example

standard input	standard output
1	578607642570710976
50 922033901407246477	
492300877907148697 8585039545574817	
36478175140515505 237143454432095134	
537753813197233578 694568987600933631	
...	
(truncated)	

Note

The full sample test case is available in the contest system.