Problem F
Fun with Fibonacci

The **Fibonacci sequence** is defined by the following recurrence relation:
$F_n = F_{n-1} + F_{n-2}$,
with seed values $F_0 = 0$ and $F_1 = 1$.
The first few values of the Fibonacci sequence are $0, 1, 1, 2, 3, 5, 8, 13, 21, \ldots$
Let:

- $G(1, n)$ denotes the n-th Fibonacci number.
- $G(2, n) = G(1, G(1, n))$,
- $G(i, n) = G(1, G(i - 1, n))$.

Calculate $G(k, n) \bmod p$.

Input

The first line of input contains the only integer T — the number of test cases. $(1 \le T \le 10^5)$.

Each test case consists of one line, containing 3 integers n, k and p, separated by single spaces. $(1 \le k, n \le 10^{18}, 1 \le p \le 10^6)$.

Output

For each test case, print a single line, containing $G(k, n) \bmod p$.

Sample Input 1	Sample Output 1
10 1 1 1000000 1 2 1000000 1 3 1000000 2 1 1000000 2 2 1000000 2 3 1000000 3 1 1000000 3 2 1000000 3 3 1000000 1000000000000000000 1000000000000000000 1000000	1 1 1 1 1 1 2 1 1 890625