Power and Mod

Exponentiation is a mathematical operation, written as b^n, involving two numbers, the base *b* and the exponent *n*. When *n* is a positive integer, exponentiation corresponds to repeated multiplication of the base: that is, b^n is the product of multiplying *n* bases:

$b^n = b \times b \times b \times \dots\dots \times b$

In computing, the modulo operation finds the remainder after division of one number by another (sometimes called *modulus*). Given two positive numbers, *a* (the dividend) and *n* (the divisor), *a* modulo *n* (abbreviated as *a* mod *n*) is the remainder of the Euclidean division of *a* by *n*. For instance, the expression "5 mod 2" would evaluate to 1 because 5 divided by 2 leaves a quotient of 2 and a remainder of 1, while "9 mod 3" would evaluate to 0 because the division of 9 by 3 has a quotient of 3 and leaves a remainder of 0; there is nothing to subtract from 9 after multiplying 3 times 3.

Now, you are given the value of a,b and m. print the value of

$$a^b \bmod m$$

Input

First line contains the number of test cases $t(1 \leq t \leq 10^4)$. Next t line contains three integers a,b and m. where $1 \leq a, b \leq 10^9$ and $1 \leq m \leq 2^{64}$

Output:

For each test case print the answer of the problem.

Sample input

2

2 3 4

3 4 5

Sample output

0

1