Exponentiation

In this task, you will be raising numbers to a power, and the result will be the value modulo some number.

Input

The first line contains a number $n(1 \leq n \leq 10^5)$, the number of test sets.

Then follow n lines. Each line contains three numbers, $a, b, p(0 \leq a, b \leq 10^9, 1 \leq p \leq 10^9)$. p may or may not be a prime number.

Output

For each triple a, b, p, print a line containing one number, $a^b \bmod p$.

Example

input	output
3 3 3 445 27 3 3 22 15 776	27 0 560