Decryption Key

It is a sunny day, and qualifications for level 4 are running in AAST.

The contestants hacked the server and was able to get a file that contain solutions to all problems, but unfortunately the file was encrypted.

They know that the decryption key is in form of (a ^ b) % m (a raised to power b modulo m), and they know a, b and m but they don't know the result of this equation and asked you for help.

Input

First line contains single interger T, then T lines follow, each line contains three integers: a,b,m.

Output

You should print T lines, which is the output of above equaiton.

Constraints

1<=T<=1000

0<=a<=1000000000000000000

0<=b<=1000000000000000000

a+b>=1

1<=m<=1000000000000000000

Example

Input:
1
2 3 5

Output:
3

Explanation:
(2^3)%5 = 8%5 = 3