Powered and Squared

Description :

Marko is learning method of successive squaring so that he can calculate a^b mod m quickly. To give himself practice he wrote many tuples of a, b and m and went to school thinking that he will do it after school.

After school he found that tuples he wrote are modified by his little sister. His sister converted each b into base 3. Marko wrote everything in base 10.

Help Marko to do his excercise.

Input:

First line of input contains a number t, number of test cases. Then t test cases follows each containing three numbers a(<=10^9), b and m(<=10^5) (a in base 10, b in base 3 and m in base 10). Number of digits in b will be less than 250**.**

Output:

Output a number for each test case a^b mod m in base 10.

Sample

Input:

2
2 10 10
3 21101 19

Output:
8
3