

New Data Type

Little boy maze invented a brand new data type that can store data from 1 to M inclusive. The speciality of the invented data type is if you want to store a data out of the range it can round the data and map with invented data type.

for example if the range is 1 to 7 and you want to store 9 then the system round 9 and map with 2.

Now you're given a number in the format A^B and the upper limit M of range. Can you round the number to map with new data type?

Input

Input starts with $T \leq 100000$.

in the next T lines there will be three integers($1 \leq A, B \leq 10000000000000000000$, $1 < M < 1000000000$).

Output

For each case print the desire output.

Example

Input:

2

2 3 5

4 2 15

Output:

3

1