Problem AB. Exponentiation II

Time Limit 1000 ms
Mem Limit 524288 kB

Your task is to efficiently calculate values a^{b^c} modulo $10^9 + 7$.

Note that in this task we assume that $0^0 = 1$.

Input

The first input line has an integer n: the number of calculations.

After this, there are n lines, each containing three integers a, b and c.

Output

Print each value a^{b^c} modulo $10^9 + 7$.

Constraints

- $1 \le n \le 10^5$
- $0 \le a, b, c \le 10^9$

Example

Input	Output
3 3 7 1 15 2 2 3 4 5	2187 50625 763327764