

Problem C. Exponentiation

Time limit 1000 ms
Mem limit 524288 kB

Your task is to efficiently calculate values a^b modulo $10^9 + 7$.
Note that in this task we assume that $0^0 = 1$.

Input

The first input line contains an integer n : the number of calculations.
After this, there are n lines, each containing two integers a and b .

Output

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

Constraints

- $1 \leq n \leq 2 \cdot 10^5$
- $0 \leq a, b \leq 10^9$

Example

Input	Output
3 3 4 2 8 123 123	81 256 921450052