Fast Exponentiation

Time: 1 sec / Memory: 256 MB

Problem Statement

Given two integers a and b, your task in this problem is to compute the value a^b modulo $10^9 + 7$.

Input

The first line contains an integer n: the number of test cases. Then there are n lines, each containing two integers a and b.

You may assume that

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

Output

For each testcase, print the value of a^b modulo $10^9 + 7$.

Example

Input:

```
3
3 4
2 8
123 123
```

Output:

```
81
256
921450052
```