

Raise the Power 300 pts

Do you know how to calculate "A" raised to the power "B"? Of course you know. What if "B" becomes very large? The answer will be huge, so just calculate the answer modulo 1,000,000,007. Can you do it? Let's see.

Input

First line will contain "T", the number of test cases. Each of the next "T" lines will contain two integers "A" and "B".

Output

For each test case, print "A" raised to the power "B" modulo 1,000,000,007 in a separate line. (Modulo operation gives the remainder, for example, $5 \bmod 3 = 2$, $10 \bmod 2 = 0$, etc.)

Constraints

$$1 \leq T \leq 10^4$$

$$0 \leq A \leq 10^{18}$$

$$0 \leq B \leq 10^{18}$$

A and B won't be 0 simultaneously.

Example

Input:

```
2
2 3
5 13
```

Output:

```
8
220703118
```