Problem G. Perfect Strings

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

Consider a character set σ of size c. There are c^{2n} strings of length $2n$, each of whose characters lies in σ. Let's call such a string perfect if the set of its indices $\{1, 2, .., 2n\}$ can be partitioned into n pairs, such that:

- Each index is a part of exactly one pair
- For each pair (i, j), $S[i] = S[j]$
- No two pairs are entangled, that is, for any two pairs (i, j) and (k, l), $i < k < j < l$ must NOT be true.

Given n and c, count the number of perfect strings of length $2n$, modulo $10^9 + 7$.

Input

The first line contains T, the number of testcases. Then the testcases follow.

Each testcase consists of two space separated integers, n and c.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq n, c \leq 10^7$
- The sum of n over all testcases doesn't exceed 10^7.

Example

standard input	standard output
2 3 1 2 2	1 6

Note

In the first testcase, there is only one string and it is clearly perfect

In the second testcase, let the character set be $\{a, b\}$. The perfect strings are (along with a partition of their indices into pairs):

aaaa	$\{(1, 4), (2, 3)\}$
aabb	$\{(1, 2), (3, 4)\}$
abba	$\{(1, 4), (2, 3)\}$
baab	$\{(1, 4), (2, 3)\}$
bbaa	$\{(1, 2), (3, 4)\}$
bbbb	$\{(1, 2), (3, 4)\}$