AntiPalindromic Strings

Problem Statement

You are given two integers, N and M. Count the number of strings of length N under the alphabet set of size M that doesn't contain any palindromic string of the length greater than 1 as a consecutive substring.

Input Format

Several test cases will be given to you in a single file. The first line of the input will contain a single integer, T, the number of test cases.

Then there will be T lines, each containing two space-separated integers, N and M, denoting a single test case. The meanings of N and M are described in the Problem Statement above.

Output Format

For each test case, output a single integer - the answer to the corresponding test case. This number can be huge, so output it modulo 10^9+7.

Constraints

$1 \leq T \leq 10^5$
$1 \leq N, M \leq 10^9$

Sample Input

```
2
2 2
2 3
```

Sample Output

```
2
6
```

Explanation

For the 1st testcase, we have an alphabet of size $M = 2$. For the sake of simplicity, let's consider the alphabet as [A, B]. We can construct four strings of size $N = 2$ using these letters.

```
AA
AB
BA
BB
```

Out of these, we have two strings, AB and BA, that satisfy the condition of not having a palindromic string of length greater than 1. Hence, the answer 2.

For the 2nd test case, we have an alphabet of size $M = 3$. For the sake of simplicity, let's consider the alphabet as [A, B, C]. We can construct nine strings of size $N = 2$ using these letters.

```
AA
AB
AC
BA
BB
BC
CA
CB
CC
```

Save AA, BB, and CC, all the strings satisfy the given condition; hence, the answer 6.