Anti-Palindromic Strings

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 *1*[st] 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 2^{nd} 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`.