

# Magical Tower Sequences

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**Time Limit:** 2.0s   **Memory Limit:** 256M

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Yusuf is a mighty wizard and he gets his power from magical tower sequences. A magical tower sequence is a sequence of  $n$  magical towers in a row.

Let's assume that the height of the  $i$ -th tower is  $A_i$ . Let's say that tower  $j$  is visible from tower  $i$  if tower  $j$  is strictly higher than all towers between tower  $i$  and tower  $j$  (not including the  $i$ -th tower). More formally, let  $S$  be the range of all towers between  $i$ -th and  $j$ -th tower. This means that  $S = [i + 1, j - 1]$  if  $j > i$ , and  $S = [j + 1, i - 1]$  otherwise. The  $j$ -th tower is visible from the tower  $i$  if  $\forall_{k \in S} A_j > A_k$ .

Let  $B_i$  be the number of towers visible from tower  $i$  (not including tower  $i$ ). Yusuf calls a sequence of towers lucky if  $A_i = B_i$  for all  $i$ . Yusuf wants you to find the number of lucky sequences of  $n$  towers modulo prime number  $m$ .

## Input

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The first line contains 2 integers  $n$  and  $m$ .

- $2 \leq n \leq 1000$ ,
- $10^7 \leq m \leq 10^9$ ,  $m$  is prime.

## Output

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Print one number, the number of lucky sequences of  $n$  towers modulo  $m$ .

## Example

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Input:

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7 47774477
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Output:

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3
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## Explanation

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Lucky sequences are  $[1, 2, 2, 2, 2, 2, 1]$ ,  $[2, 2, 3, 2, 3, 2, 2]$ ,  $[2, 3, 2, 4, 2, 3, 2]$ .