

Flowers

Hanadi has **N** flower pots each with a unique flower. The pots are arranged along in a line. One day, She decided to change their order under the condition that no two pots that were originally next to each other remain next to each other.

Task

write a program that is given the number of pots, calculates the number of possible orders satisfying the condition modulo a given integer M.

Constraints

$1 \leq N \leq 2,000$ The number of pots.

$2 \leq M \leq 1,000,000,000$

Input

- Line 1 contains the integer **N**, the number of flower pots.
- Line 2 contains the integer **M**.

Output

A single line containing one integer between **0** and **M-1** (inclusive): the number of possible orders modulo **M**.

Example

Input:

5

11

Output:

3

For **5** pots, there are **14** orders satisfying Hanadi's condition, assuming the original order of pots was "**ABCDE**"

Then the **14** possible orders are:

ACEBD

ADBEC

BDACE

BDAEC

BECAD

CADBE

CAEBD

CEADB

CEBDA

DACEB

DBEAC

DBECA

EBDAC

ECADB

14 modulo 11 = 3

So the answer is **3**.

- Number of test-cases is **28**.