Bracket Sequestion

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3.5 seconds
Memory limit:	1024 megabytes

You are given a positive integer N and a prime number M.

A string consisting of `(`, `?`, `)` is called **good** if it satisfies the following conditions:

- By replacing each `?` in the string with either `(` or `)`, it can be transformed into a **balanced brackets sequence**.

Find the number of good strings of length $2N$, modulo M.

Here, a **balanced brackets sequence** is defined as one of the following:

- An empty string.
- There exists a balanced brackets sequence A, and the string obtained by concatenating `(`, A, `)` in this order.
- There exist non-empty balanced brackets sequences A and B, and the string obtained by concatenating A, B in this order.

Input

The input is given from Standard Input in the following format:

N M

- All values in the input are integers.
- $1 \leq N \leq 9 \times 10^8$
- $9 \times 10^8 \leq M \leq 10^9$
- M is a prime number.

Output

Output the answer.

Examples

standard input	standard output
1 998244353	4
2 900000011	28
999937 999999937	170733195
167167924 924924167	596516682

Note

In the first example, there are 4 good strings of length $2N(= 2)$: `()`, `(?`, `?)`, `??`.