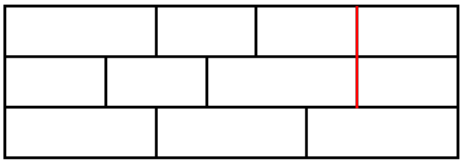
Project Euler #215: Crack-free Walls

This problem is a programming version of Problem 215 from projecteuler.net

Consider the problem of building a wall out of 2×1 and 3×1 bricks (horizontal×vertical dimensions) such that, for extra strength, the gaps between horizontally-adjacent bricks never line up in consecutive layers, i.e. never form a "running crack".

For example, the following 9×3 wall is not acceptable due to the running crack shown in red:



There are eight ways of forming a crack-free 9×3 wall, written $W(9,3) = 8$.

Calculate $W(w,h) \bmod m$.

Input Format

The only line of each test file contains three integers separated by single spaces: w, h and m.

Constraints

- $5 \leq w \leq 45$
- $2 \leq h \leq 50$
- $1 \leq m < 2^{30}$

Output Format

Print exactly one integer that is $W(w,h) \bmod m$.

Sample Input 0

```
9 3 1000
```

Sample Output 0

```
8
```