

# Spy Reloaded

See problem [SPY](#) for more background information.

Blue Mary extremely likes making PPTs. She has already made  $2L$  PPTs. Now the only problem before finishing is to set the background pictures for each PPT. She has an **odd** number (denoted by  $N$ ) of background pictures ranging from 0 to  $N-1$  inclusive. Each PPT needs exactly one background picture. Different PPTs can use same background pictures. Obviously, there are  $N^{2L}$  combinations.

For each combination, Blue Mary defines its weight as the sum of the IDs of the first  $L$  PPTs minus the sum of the IDs of the last  $L$  PPTs. Now Blue Mary wants to calculate the number of combinations with a positive weight. (Blue Mary is such a weird girl that she always does some meaningless calculations.) She asks you for help.

Since this number can be quite large, Blue Mary only needs the number modulo a prime  $P$ .

## Input

Several test cases, the number of which is less than 3333. Each test case consists of a single line with three space-separated integers  $N$  ( $1 \leq N \leq 3333$ ),  $L$  ( $1 \leq L \leq 3333$ ) and  $P$  ( $10^8 \leq P \leq 10^9$ ). Input terminates by EOF.

Input data is generated with almost log-uniform random distribution.

## Output

For each test case, output the required value in a single line.

## Example

### Input:

```
1 1 100000007
3 2 999999937
```

### Output:

```
0
31
```