# Scalar Products

Integer sequence $a$ having length $2n+2$ is defined as follows:

- $a_0 = 0$
- $a_1 = C$
- $a_{i + 2} = (a_{i + 1} + a_i) \ \% \ M$, where $0 \leq i \lt 2n $

Write a function generator, $gen$, to generate the remaining values for $a_2$ through $a_{2n+1}$. The values returned by $gen$ describe two-dimensional vectors $v_1 \dots v_n$, where each sequential pair of values describes the respective $x$ and $y$ coordinates for some vector $v$ in the form $x_1, y_1, x_2, y_2, \ldots, x_n, y_n$. In other words, $v_1 = (a_2, a_3), v_2 = (a_4, a_5), \dots , v_n = (a_{2n}, a_{2n+1})$.

Let $S$ be the set of scalar products of $v_i$ and $v_j$ for each $1 \le i, j \le n$, where $i \neq j$. Determine the number of different residues in $S$ and print the resulting value modulo $M$.

**Input Format**

A single line of three space-separated positive integers: $C$ (the value of $a_1$), $M$ (the modulus), and $n$ (the number of two-dimensional vectors), respectively.

**Constraints**

- $1 \le C \le 10^9$
- $1 \le M \le 10^9$
- $1 \le n \le 3 \times 10^5$

**Output Format**

Print a single integer denoting the number of different residues $\% \ M$ in $S$.

**Sample Input**

```
4 5 3
```

**Sample Output**

```
2
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**Explanation**

Sequence $a = a_0, a_1, (a_1+a_0)\%M, (a_2+a_1)\%M, \ldots, (a_{2n}+a_{2n-1})\%M\}$ $= \{0, \ 4, \ (4+0)\%5, \ (4+4)\%5, \ (3+4)\%5, \ (2+3)\%5, \ (0+2)\%5, \ (2+0)\%5 \}$ $= \{0, 4, 4, 3, 2, 0, 2, 2\}$.

This gives us our vectors: $v_1 = (4, 3)$, $v_2 = (2, 0)$, and $v_3 = (2, 2)$.

Scalar product $S_0(v_1,v_2) = 8$.
Scalar product $S_2(v_2,v_3) = 4$.
Scalar product $S_0(v_1,v_3) = 14$.

There are $2$ residues $\% \ 5$ in $S$ (i.e.: $3$ and $4$), so we print the result of $2 \%5$ (which is $2$).