

6242 Fibonacci Extended

The classic definition of Fibonacci numbers is that the next number in the sequence is the sum of the previous two. For this problem, we will extend that definition to allow for adding any given number of previous values.

More precisely, we define $F(n, k, q)$ as follows:

$$F(n, k, q) = \begin{cases} 1 & \text{if } 0 \leq n < k \\ \left(\sum_{i=1}^k F(n-i, k, q) \right) \bmod q & \text{otherwise} \end{cases}$$

Thus, the standard Fibonacci number sequence can be viewed as $F(n, 2, q)$ if q is larger than the value we are interested in.

Input

There will be multiple cases, each given by three integers: n, k, q (in that order, as described above). For this problem, you may assume that $0 < n < 1,000,000$, that $0 < k < 1,000,000$, and that $1 < q < 2^{30}$. The last input case will be followed by a line of three zeros.

Output

Follow the format below exactly, 'Case', one space, the case number, a colon and one space, and the answer for that case.

Sample Input

```
1 2 1000
5 2 1000
5 3 10
0 0 0
```

Sample Output

```
Case 1: 1
Case 2: 8
Case 3: 9
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