# Another Contest 8 Problem 3 - Replay Double Ignition

**Time limit:** 0.25s **Memory limit:** 1G

Brandon likes Fibonacci numbers. For the purposes of this problem, the Fibonacci sequence is defined as the sequence of integers $f$, where $f_1 = f_2 = 1$, and $f_i = f_{i-1} + f_{i-2}$ for $i \geq 3$.

One day, Brandon writes down the sequence $f$ starting with $f_1$, except that because he does not have good arbitrary-precision arithmetics available to him, he ends up writing down the values of $f_i$ modulo $M$. He wants to know the $N$th digit he writes down for several different values of $N$.

## Constraints

$2 \leq M \leq 10^4$

$1 \leq N_i \leq 10^{18}$

$1 \leq Q \leq 10^6$

## Input Specification

The first line contains two positive integers, $M$ and $Q$.

The next $Q$ lines each contain a single positive integer, $N_i$.

## Output Specification

Output $Q$ lines. On the $i$th line, output the $N_i$th digit that Brandon wrote down.

## Sample Input 1

```
10 11
1
2
3
4
5
6
7
8
9
10
11
```

## Sample Output 1

```
1
1
2
3
5
8
3
1
4
5
9
```

## Sample Input 2

```
100 11
1
2
3
4
5
6
7
8
9
10
11
```

## Sample Output 2

```
1
1
2
3
5
8
1
3
2
1
3
```