Fibonacci-like sequences P68314_en

Inspired by the Fibonacci sequence $F_0 = 0, F_1 = 1, F_n = F_{n-1} + F_{n-2}$ for $n \geq 2$, Xavier defined his own sequence of numbers:

$$X_0 = 0, X_1 = 1, X_n = X_{X_{n-1}} + X_{X_{n-2}} \text{ for } n \geq 2.$$

Max also wanted his own sequence of numbers, so he modified Xavier's definition a bit:

$$M_0 = 1, M_1 = 0, M_n = M_{M_{n-1}} + M_{M_{n-2}} \text{ for } n \geq 2.$$

Can you compute the n-th term of any of these two new sequences?

Input

Input consists of several cases, each with a character c, which is '`X`' or '`M`', and a natural n between 0 and 10^9.

Output

For each case, print X_n or M_n depending on c.

Sample input 1

```
X 0
X 1
X 2
X 3
M 0
M 1
M 2
M 3
```

Sample output 1

```
0
1
1
2
1
0
1
1
```

Problem information

Author: Félix Moreno

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