Fibonacci-like sequences P68314_en

Vintè Concurs de Programació de la UPC - Final (2022-09-21)

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	Sample output
`X 0`	`0`
`X 1`	`1`
`X 2`	`1`
`X 3`	`2`
`M 0`	`1`
`M 1`	`0`
`M 2`	`1`
`M 3`	`1`

Problem information

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