Problem A: Modular Fibonacci

The Fibonacci numbers (0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, …) are defined by the recurrence:

$$F_0 = 0$$
$$F_1 = 1$$
$$F_i = F_{i-1} + F_{i-2} \textbf{ for } i>1$$

Write a program which calculates $M_n = F_n$ **mod** 2^m for given pair of n and m. $0 \le n \le 2147483647$ and $0 \le m < 20$. Note that a *mod* b gives the remainder when a is divided by b.

Input and Output

Input consists of several lines specifying a pair of n and m. Output should be corresponding M_n, one per line.

Sample Input

```
11 7
11 6
```

Sample Output

```
89
25
```

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