SUMMING

Find the sum of x smallest distinct numbers of the series $2^i \times 3^j$ ($i, j \geq 0$).

- the first number of the series is $1 = 2^0 \times 3^0$
- the second number of the series is $2 = 2^1 \times 3^0$
- the third number of the series is $3 = 2^0 \times 3^1$
- the fourth number of the series is $4 = 2^2 \times 3^0$
- the fifth number of the series is $6 = 2^1 \times 3^1$

As the sum can be huge print sum **modulo** k.

Input

The input contains 2 numbers x and k: $1 \leq x \leq 10^{14}$, $1 \leq k \leq 10^8$

Output

The output contains sum of the first x numbers of the series **modulo** k.

Example

Input:
1 1000

Output:
1

Input:
2 1000

Output:
3

Explanation: $3 = 2^0 \times 3^0 + 2^1 \times 3^0 \pmod{1000}$.

Input:
4 1000

Output:
10

Input:
6 2

Output:
0

Input:
16 1000

Output:

Processing math: 93%