

# Loving Power

Angel Luis is now getting math class. His teacher is teaching to him the XOR operation:

- $0 \text{ XOR } 0 = 0$
- $0 \text{ XOR } 1 = 1$
- $1 \text{ XOR } 0 = 1$
- $1 \text{ XOR } 1 = 0$

When a number has more than one bit, the operation is applied to all bits. The teacher write two numbers  $x, y$  ( $0 \leq x, y \leq N$ ) and make the XOR operation between  $x$  and  $y$ , Angel Luis would like to know how many pairs  $x, y$  such  $x \text{ XOR } y = 2^z$  where  $z \geq 0$ .

See that for  $N = 3$ :

- $0 \text{ XOR } 1 = 2^0$
- $0 \text{ XOR } 2 = 2^1$
- $3 \text{ XOR } 1 = 2^1$
- $2 \text{ XOR } 3 = 2^0$

So there are 4 pairs.

Given  $N$  you should return the number of pairs modulo 1000000007.

## Input

First line contains number  $t$  - the number of cases. Following  $t$  lines will each have a number  $N$ .

$t \leq 100$

$N \leq 1000000000000000$  ( $10^{15}$ ).

## Output

For each case the number of pairs modulo 1000000007.

## Example

**Input:**

3  
1  
2  
3

**Output:**

1  
2  
4