

Number of zero-xor subsets



You are given an integer N . Consider set $S = \{0, 1, \dots, 2^N - 1\}$. How many subsets $A \subset S$ with $\bigoplus_{x \in A} x = 0$ (\oplus denotes xor operation) are there?

Print your answer modulo $(10^9 + 7)$.

Note that the xorsum of an empty set is zero!

Input Format

The first line contains one integer T , the number of testcases.

The next T lines contain one integer N each.

Output Format

Output T lines. Each line is one number, answer to the problem modulo $10^9 + 7$.

Constraints

$$1 \leq T \leq 10000$$

$$1 \leq N \leq 10^{18}$$

Sample Input

```
2
1
2
```

Sample Output

```
2
4
```

Explanation

For $N = 1$ there are 2 sets - \emptyset and $\{0\}$.

For $N = 2$ there are 4 sets - \emptyset , $\{0\}$, $\{1, 2, 3\}$, $\{0, 1, 2, 3\}$.