A Talent Show

Description

Given $n = 5$ and $a_1 = 8, a_2 = 17, a_3 = 10, a_4 = 15, a_5 = 27$, and a special number x given in the input, please calculate $f(x) = \{[(\sum_{i=1}^{n} a_i \times x^{n-i} + a_i^x) + x^x] \bmod 2\} + 1$.

Please note: in the problem, we have $0^0 = 1$.

Input

The first line of the input contains an integer T denotes the number of test cases in this input.

Each test case contains one line with one integer x.

- $1 \leq T \leq 10^5$
- $0 \leq x \leq 10^{18}$

Output

For each test case, output $f(x)$ modulo 100000007 in one line.

Sample Input

```
1
0
```

Sample Output

```
2
```