Sum and Xor

Given a integer N, find the number of positive integers X such that X<=N and N+X = N^X (N xor X).

Input Format

First line of input contains T - number of test cases. Its followed by T lines, each line contains a single integer N.

Constraints

30 points
$1 <= T <= 10^3$
$0 <= N <= 10^3$

70 points
$1 <= T <= 10^4$
$0 <= N <= 10^{18}$

Output Format

For each test case, print the count of X's, separated by new line.

Sample Input 0

```
2
5
10
```

Sample Output 0

```
1
3
```

Explanation 0

Test Case 1
Possible values: 5+2 = 5^2.

Test Case 2
Possible values: 10+1 = 10^1, 10+4=10^4, 10+5=10^5