B. Division of Power 2

time limit per test: **1 second**
memory limit per test: **256 megabytes**
input: **B.inp**
output: **B.out**

Given a non-negative integer x of the form 2^y.

Find the sum of positive integer divisor of x.

Input

The first line contains an integer t $(1 \le t \le 10^3)$. — the number of test cases. Then t test cases follow.

Each test case is non-negative integer y $(0 \le y \le 10^{18})$.

Output

Integer, the sum of positive integer divisor of x

Example

input
2
1
2
output
2
3

Note

Division of 2^1 is 1 and 2.

Division of 2^2 is 1, 2 and 4.