

A. Tricky Sum

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

In this problem you are to calculate the sum of all integers from 1 to n , but you should take all powers of two with minus in the sum.

For example, for $n = 4$ the sum is equal to $-1 - 2 + 3 - 4 = -4$, because $1, 2$ and 4 are $2^0, 2^1$ and 2^2 respectively.

Calculate the answer for t values of n .

Input

The first line of the input contains a single integer t ($1 \leq t \leq 100$) — the number of values of n to be processed.

Each of next t lines contains a single integer n ($1 \leq n \leq 10^9$).

Output

Print the requested sum for each of t integers n given in the input.

Examples

input
2
4
1000000000
output
-4
499999998352516354

Note

The answer for the first sample is explained in the statement.

Educational Codeforces Round 1

Finished

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→ Problem tags

math

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